Celebrating the 20th anniversary of the Bebras Challenge and the Bebras community
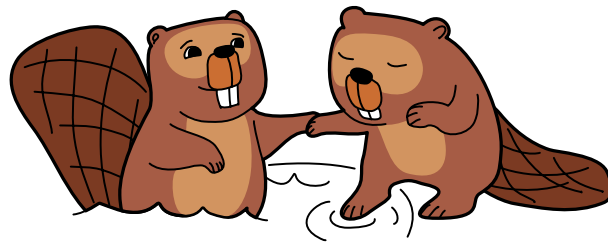
This photo book is presented to you as a thank you for all the work that you have put into the Bebras challenge.

For new joiners, it is a present to welcome you to the Bebras community.

2024

Vilnius University

Bebras is an international informatics and computational thinking challenge and a rapidly expanding community of computer science enthusiasts spanning nearly 90 countries. In the school year 2023-2024, nearly four million school students worldwide participated in the Bebras challenge.

The annual Bebras challenge is organised locally by each participating country. Typically, participants are supervised by their teachers who integrate Bebras tasks into their classroom teaching. Each participating country selects tasks from that year's Bebras task pool which is approved at the annual International Bebras Task Workshop.

The Bebras challenge aims to encourage all students to develop a greater appreciation of and a deeper engagement with computing by applying computational thinking to solve computing related tasks. Hopefully, by being given the opportunity to solve Bebras tasks, students will be inspired to investigate digital technologies, discover how computer applications are constructed, and develop new products. In collaboration with teachers, researchers, educationists, and students, the Bebras community develops tasks, methodological tools, teaching materials for informatics teachers, and games for nurturing computational thinking.

Informatikos ir informatinio mąstymo iššūkio Bebras 20-metį pasitinkame esant sudėtingai situacijai pasaulyje.

Nepaisant to, Bebro bendruomenė šiuo metu vienija 87 šalis, sutartinai rūpinasi informatikos mokymu mokykiose, gilinasi į technologijų naujoves. Lietuvos mokslininkų entuziastų pasiūlyta informatikos mokymo idėja, sisteminis požiūris ir atsakingas darbas sudaro sąlygas daugeliui pasaulio šalių geriau mokyti ar pradėti mokyti informatikos mokykiose. Per 20 metų Bebro bendruomenė sukūrė ir pristatė mokykioms keletą tūkstančių įdomių ir turtingų informatikos uždavinių.
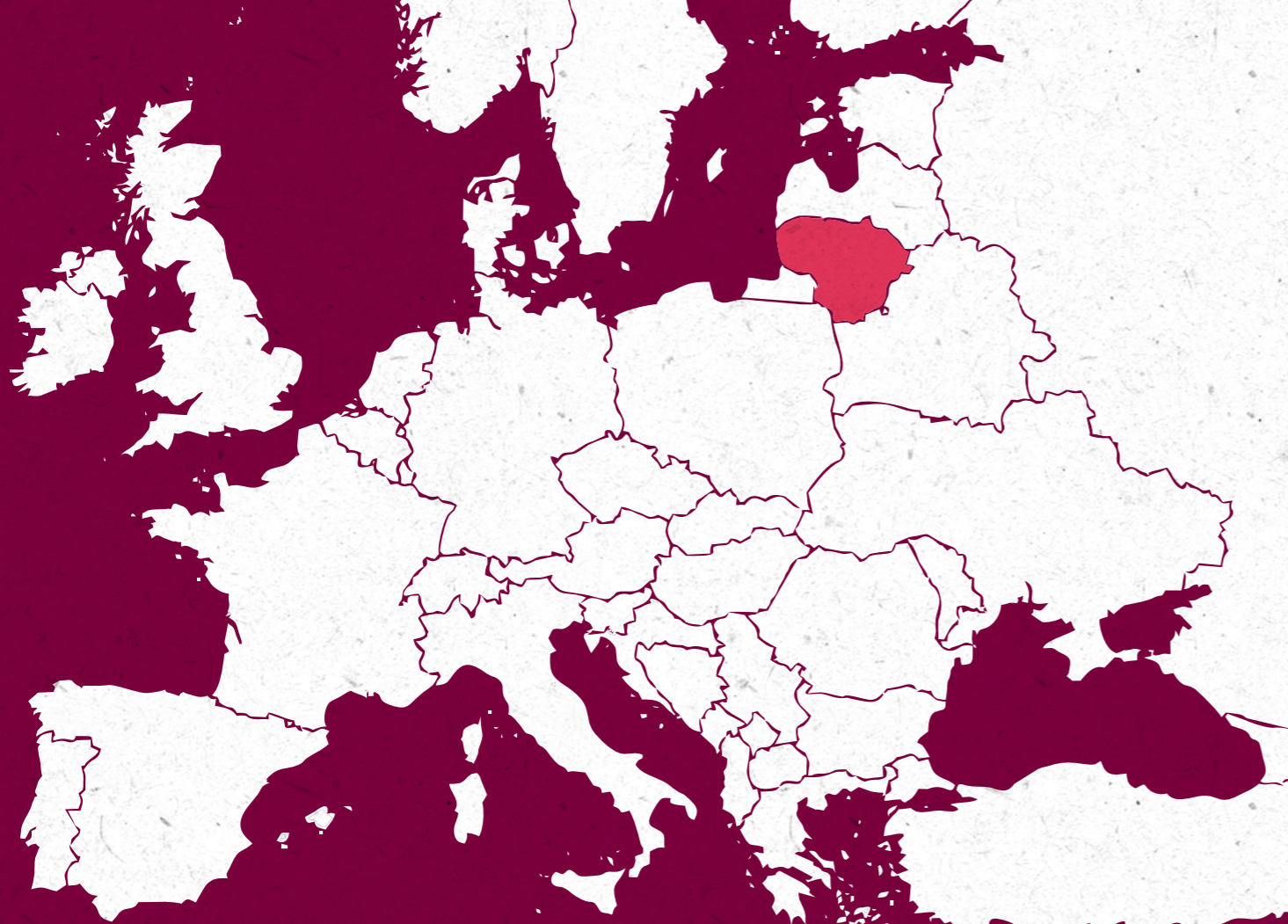
Nuoširdžiai sveikinu visus mokytojus, mokslininkus, inžinierius, programuotojus ir visus kitus besirūpinančius informatinio mąstymo ugdymu mokykiose ir prisidedančius prie šio šaunaus informatikos Bebro tinklo. Linkiu gyvuoti taip pat sėkmingai ir kitą dvidešimtmetį.

The 20th anniversary of the Bebras Challenge on Informatics and Computational Thinking is being celebrated against the backdrop of a challenging global situation. Despite this, the Bebras community, which now covers 87 countries, shares a commitment to computer science education in schools and a keen interest in technological innovation. The idea of teaching informatics proposed by Lithuanian researchers, along with their systematic approach and responsible work, enables many countries around the world to provide better training or initiate the teaching of informatics in schools. Over the last 20 years, the Bebras community has developed and delivered several thousand exciting and content-rich informatics problems to schools.

I would like to offer my sincere congratulations to all the teachers, scholars, engineers, programmers, and everyone else involved in developing computational thinking in schools who have contributed to the Bebras Challenge, this great network of informatics. I wish you continued success for the next twenty years.

Prof. Dr. Rimvydas Petrauskas
Vilniaus universiteto rektorius

The Bebras challenge traces its roots back to September 25th, 2004, when an experimental trial was conducted in Lithuania, involving 779 school students. This initiative was conceived at the Institute of Mathematics and Informatics (now the Institute of Data Science and Digital Technologies at Vilnius University, Lithuania), with the idea proposed by Professor Valentina Dagienė.

The birth of the Bebras
Vilnius, Lithuania

2004

BEBRAS®

VILNIUS UNIVERSITAS · 1579 · UNIVERSITAS VILNENSIS
Vilnius University

2005

Members!

**Lithuania
Netherlands**

Austria
Estonia
Germany
Latvia
Poland

Provisional members!

Logo turtle
2005-LT

Logo turtle may perform the following commands:

forward n – to move forward drawing a line of n steps long;

left α – to turn left making an angle of α degrees;

repeat k [forward 30 left 60] – to move forward drawing a line of 30 steps long and to turn left making an angle of 60 degrees; these actions are repeated k times.

At the beginning Logo turtle looks up.

Which of the presented shapes is drawn by using the following command

```
repeat 4 [repeat 2 [repeat 90
               [forward 0.5 right 1]
             right 90] left 90]
```
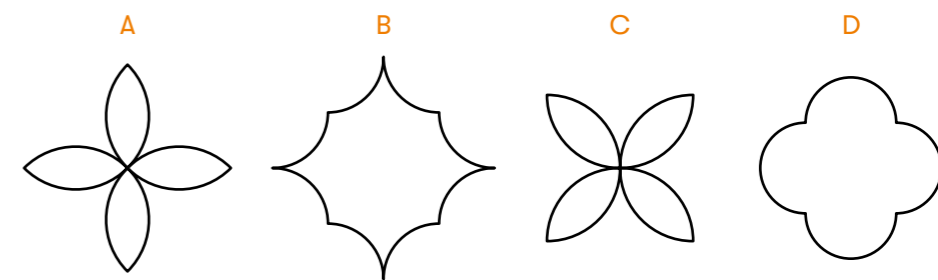
A   B   C   D

2nd International Bebras Task Workshop
Pasvalys, Lithuania

2006
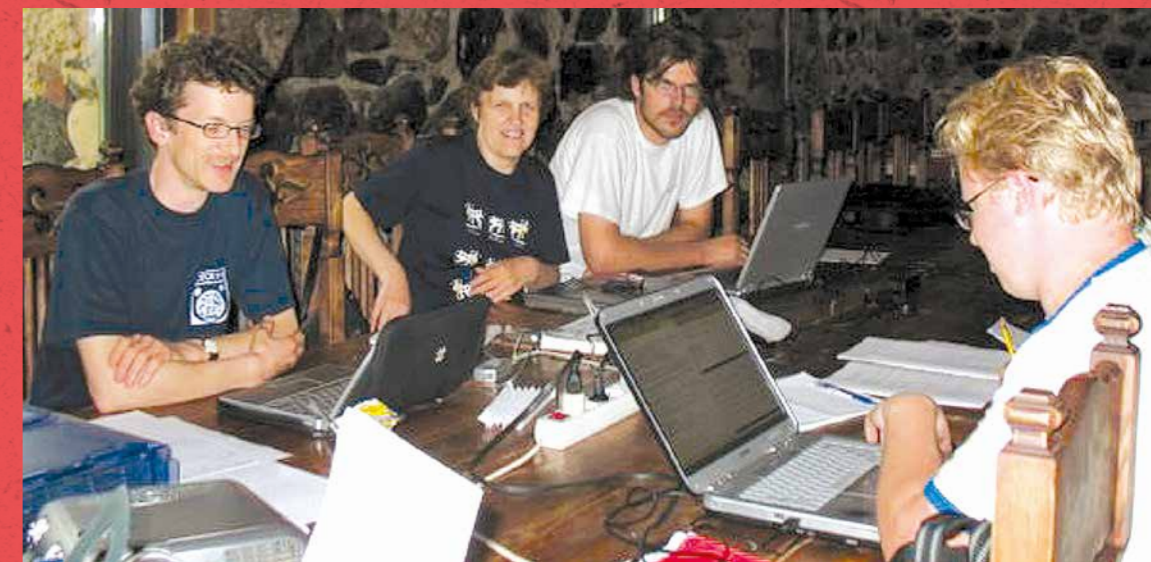
BALSIAI

2006
21-25 June

Agenda of International *Bebras* Workshop
Balsiai, Pasvalys, 21-25 June, 2006

The main purpose of the joint work during this event is to create tasks for the next contests and to decide about the future activities of International *Bebras* Committee.

Wednesday, June 21
Arrivals
19:00   Get together party

Thursday, June 22
9:00–13:00 Presentations from countries about local contests or plans:
            Austria, Estonia, Latvia, Germany, Poland, The Netherlands (30-45 min for each)
            Future of International *Bebras* Committee - open discussion
                                                (moderated by Elmundas Žalys)
13:00–15:00 Lunch
15:00–17:00 Overview of Lithuanian contests (tasks, statistics, software, Jūratė Aušraitė)
            Topics for *Bebras* tasks (presentation by Ahto Truu)
Coffee break
18:00–20:00 Discussions on the proposal to Minevra (Mikhel Pilv, Estonia and Maciej Syslo, Poland)
Excursion to Pasvalys

Friday, June 23
9:00–13:00 Mindstorm: Time for developing tasks
            (in groups of interests, each group has at least one student from Lithuania)
13:00–15:00 Lunch
15:00–17:00 Mindstorm: Time for developing tasks
Coffee break
18:00–20:00 Mindstorm: Evaluation of presented tasks, comments, selection.
Traditional *Joninės* (Midsummer Day) celebration.

Saturday, June 24
9:00–13:00 Mindstorm: Time for developing tasks
13:00–15:00 Lunch
15:00–17:00 Mindstorm: Evaluation of presented tasks, comments, selection
Coffee break
18:00 Final discussions

Sunday, June 25
Departure

Bebras code
2006-NL

In Bebras-code, words are split into two substrings; one of them contains the characters that are on the odd positions of the string, and the other one contains the characters that are on the even positions of the string. This process is applied repeatedly to each resulting substring longer than 2 characters. The resulting substrings are put together as one word (see the figure for the order). So the Bebras-code of "computer" is "cumeotpr" and the Bebras-code of "beaver" is the word "beaerv".
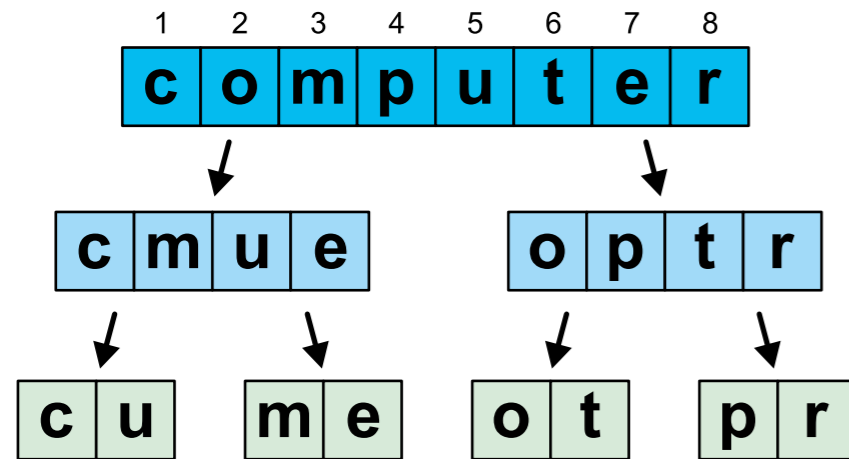
gives as a result:

What is the Beaver code of "kangaroo"?
A kanoargo
B knaoagro
C knagaoro
D knaoorgn

A flower
2006-EE

Mary has drawn half of a flower. What is the minimal number of times the commands COPY, PASTE, FLIP, and ROTATE should be used to create the image on the right, starting from the image on the left? (The commands may also be applied to groups.)
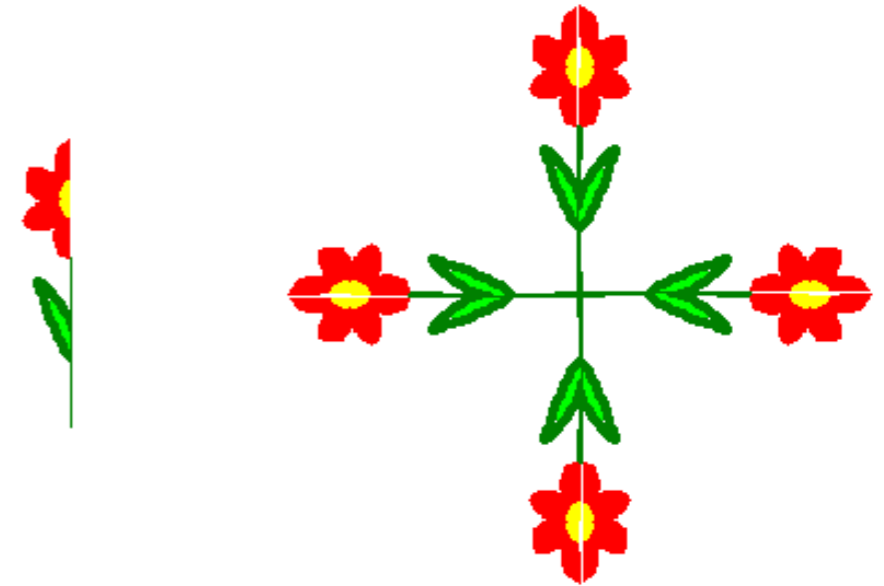
3rd International
Bebras Task Workshop
Pasvalys, Lithuania

Austria
Estonia
Germany
Latvia
Lithuania
Netherlands
Poland
Israel
Slovakia

2007

Road crossing
2007-SK
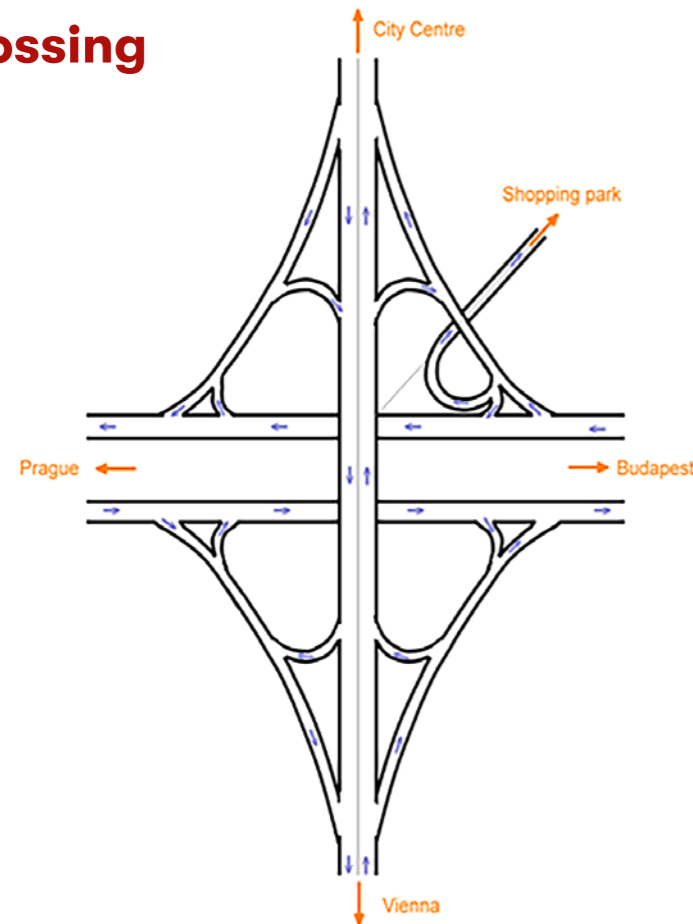
The picture shows a simplified scheme of a complex road crossing. Suppose that the angle of the two main roads is exactly 90 degrees and the angle between the exit to the Shopping park and the horizontal road is exactly 45 degrees (shown by the grey line).

If you are driving from Budapest and want to turn to the city centre then it is easy - the total turn made by your car is 90 degrees to the right. But if you want to turn to Vienna your car cannot turn 90 degrees to the left. It must turn 270 degrees to the right. Note that in these types of crossings all turns must be made only to the right.

How much does your car turn in total if you are coming from Vienna and want to go to the Shopping park?

Binary
2007-LT

Decode the message in the rectangle by the following key (on the right).

6	C	H	T	O
11	B	M	O	P
4	P	E	E	T
2	I	T	R	I
15	A	N	C	P
10	D	O	S	N

0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Example:

6	B			I
13			N	
10		A		R
11		Y		

4th International Bebras Task Workshop
Torún, Poland

2008

Austria
Estonia
Germany
Latvia
Lithuania
Netherlands
Poland
Slovakia
Israel
Ukraine

Icebreaker

In which of the cases the maximum number of swaps is needed to get in alphabetical order?

A   The children are placed in random order.
B   A child with initial Z is placed on the first chair.
C   The children are placed in reverse order.
D   The starting order doesn't matter because each two children have to swap places at least once.

Decoding

Beaver Barney and Beaver Barbara often write messages. However they don't want the other beavers to read the messages, therefore they made a code. They said: "Take each letter and multiply the corresponding number (from the table) by two."
„Beaver" for example is 4102741056.

A 1	H 8	O 25	V 37
B 2	I 9	P 26	W 38
C 3	J 15	Q 27	X 39
D 4	K 16	R 28	Y 45
E 5	L 17	S 29	Z 46
F 6	M 18	T 35	! 47
G 7	N 19	U 36	? 48

What means the Code „18381250587027018658"?

A INFOSTATION
B INFOSTATICS
C INFORMATICS
D INFOMETRICS

**5th International
Bebras Task Workshop**
Pasvalys, Lithuania

2009

**Austria
Estonia
Germany
Latvia
Lithuania
Netherlands
Poland
Slovakia**
Czechia
Israel
Italy
Ukraine

BEBRAS
2009
PASVALYS
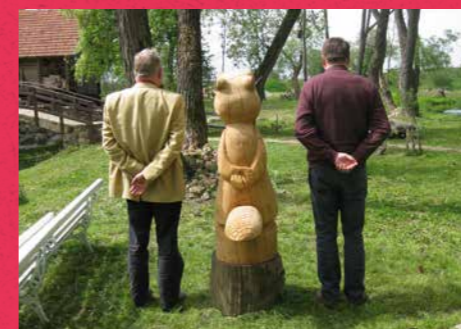
Rainbow eggs

Lina dyes eggs. She uses three cups of color. There is plenty of yellow and red color, so she can dip two thirds of each egg into yellow or red. But there is little blue color, so she can dip only one third of each egg into blue.
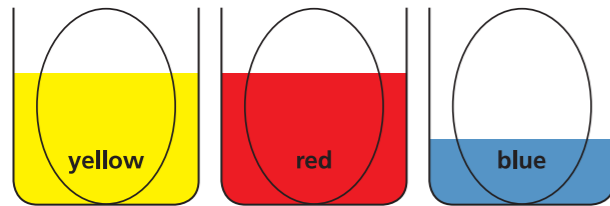
Lina dips all eggs as deep as possible:
Yellow and red meld to orange.
Yellow and blue meld to green.
Red and blue meld to violet.
Lina never melds more than two colors.

For example: By dipping one egg into red, then into blue, then turning it over and dipping it into blue again, she gets an egg that is violet-red-blue.

Only one of these eggs could have been dyed by Lina. Which one?
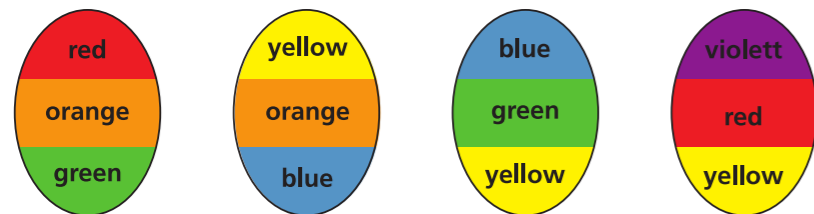
A red-orange-green
B yellow-orange-blue
C blue-green-yellow
D violet-red-yellow

Logic operations: letter E

Logic operations are applied even in computer graphics. Intersection of two objects is the area by which they overlap each other. Union of two objects is the area formed by uniting both. Difference of two objects X and Y is the object X with the part by which it overlaps the object Y cut out.

We can use:
```
intersection (X, Y)
union (X, Y)
difference (X, Y)
```

The expression `union (intersection (X, Y), Z)` means the union of the intersection of X and Y with the object Z.

What logic operations can be applied to form a letter e out of two ellipses A, B and two rectangles C, D?

A `difference (union (difference (A, B), C), D)`
B `difference (intersection (difference (A, B), C), D)`
C `intersection (A, difference (B, union (C, D)))`
D letter e cannot be formed from these objects

6th International Bebras Task Workshop
Dagstuhl, Germany

2010

Austria
Estonia
Czechia
Germany
Latvia
Lithuania
Netherlands
Poland
Slovakia
Finland
Israel
Italy
Switzerland
Ukraine
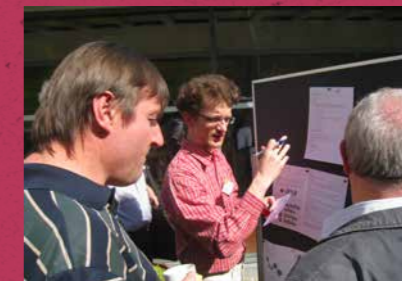
Beetle path

A robotic beetle is moving around this playing field

according to these rules:
• The beetle starts on a randomly chosen cell.
• In one step, the beetle looks at the arrows shown in the cell where it is staying and moves in the direction of the arrows as many cells as indicated by the number of arrows (one cell if there is one arrow, two cells if there are two arrows, and three calls if there are three arrows).
• During executing of a step, the beetle ignores the arrows in cells that it passes trough.
• The beetle repeats its steps until it either gets outside the playing field or it reaches a cell that has no arrows (column E).

In which cells of column A the beetle could start to end in a cell of column E?

Graph of a map

Maps can be easily pictured as graphs. In such a graph every node is a country and the lines between the nodes mean that they border each other. The picture shows a graph of a map with seven countries.
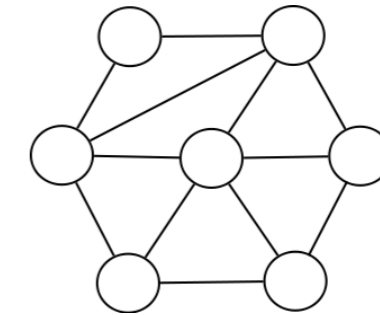
Beaver Jim has to find a map that fits the given graph. He has four options. Can you help him find a map that matches the graph?

**7th International
Bebras Task Workshop**
Druskininkai, Lithuania

2011

**Austria
Czech
Estonia
Germany
Italy
Latvia
Lithuania
Netherlands
Poland
Slovakia
Ukraine**
Canada
Cyprus
Finland
France
Hungary
Israel
Japan
Slovenia
Spain
Switzerland

PADĖKA

Mokytojas (-a)

Mokykla

Nuoširdžiai dėkojame už

8-OJO TARPTAUTINIO
INFORMATIKOS IR IT
KONKURSO **BEBRAS**

vykdymą Jūsų mokykloje.

ORGANIZACINIO KOMITETO PIRMININKĖ
PROF. VALENTINA DAGIENĖ

VILNIUS
2011 LAPKRIČIO 26

VILNIAUS UNIVERSITETO MATEMATIKOS IR INFORMATIKOS INSTITUTAS

Missing piece

2011-CH-10

Beaver John has received a secret message. Unfortunately a part of the message has been destroyed by a spill of red colour.

This case was foreseen and there are additional squares in the message. Each square in the rightmost column (column 6) and the lowest row (row 6) is coloured such that the number of black squares in its row or column is even.

John considers there are sixteen different possible messages. Only four of them make sense to him.

What is the pattern of the red piece?

Plant life

2011-DE-01

The Beaver loves flowers. May be this is the reason why he has invented a simple programming language for visual design based on the idea of plant life. Each picture starts with a square called a. A visual object can perform three operations: grow(), split() and die(). The following program explains the semantics:

a.grow(east);   a.grow(east) ;

b,c = a.split();   c.grow(north);   b.die();
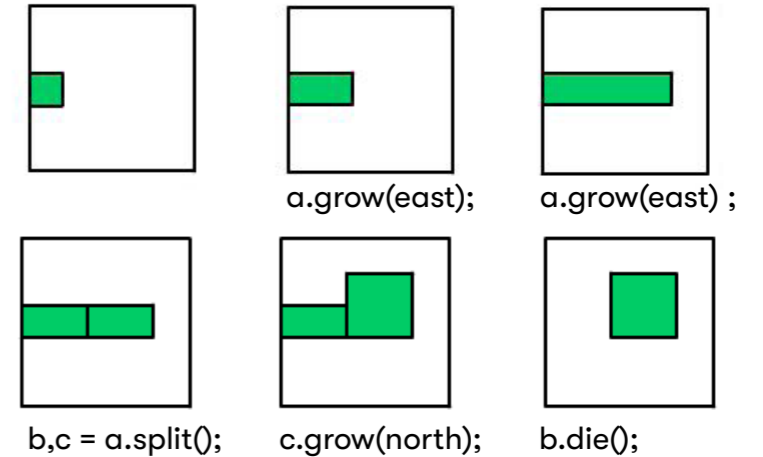
Please note, that only an oblong object may execute the split()-operation producing two shorter objects of equal size. A square cannot be split. Beaver wants to write a program that transforms the left image to the right image.
Which could be the first four commands of this program?

A   a.grow(east); a.grow(east); b,c = a.split(); b.die();
B   a.grow(north); a.grow(east); a.grow(east); b,c =a.split();
C   a.grow(east); a.grow(east); a.grow (north); a.die();
D   a.grow(east); b,c = a.split(); c.grow(north); c.grow(east);

8th International
Bebras Task Workshop
Druskininkai, Lithuania

Austria
Czechia
Estonia
Germany
Italy
Israel
Latvia
Lithuania
Netherlands
Poland
Slovakia
Ukraine
Belgium
Bulgaria
Canada
Cyprus
Finland
France
Hungary
Ireland
Japan
Russia
Slovenia
Spain
Sweden
Switzerland
Taiwan

2012
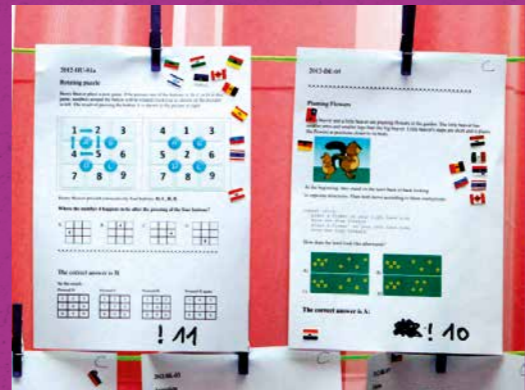
Rotating puzzle

Henry Beaver plays a new game. If he presses one of the buttons A, B, C or D in this game, numbers around the button will be rotated clockwise as shown on the left in the figure. The result of pressing the button A is shown on the right in the figure.
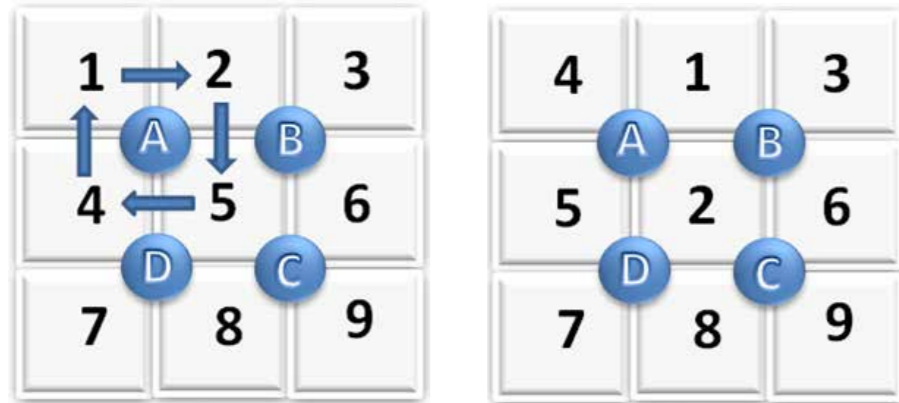
Starting from the position shown on the left in the figure, Henry presses the buttons D, C, B, B, in this order.

Where will the number 4 be after he presses the four buttons?

A   B   C   D
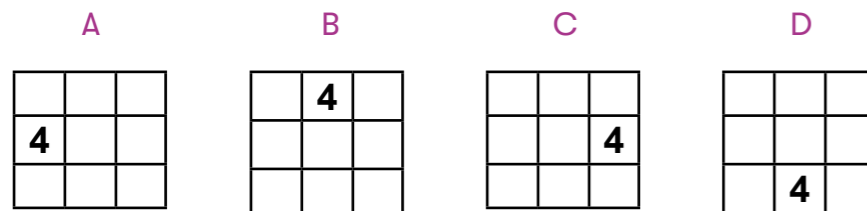
Paper Folding

The Beaver has developed a programming language for paper folding. This language can be used to explain how to fold any piece of paper with straight sides. One of the commands in this language is `fold`.

`e = fold(a, b)` means:
fold the piece of paper so that the side `a` is lying completely on the side `b`.
In that way you create a new side, the fold, which will be called `e`.
Example:

e = fold(a, b)   f = fold(a, e)
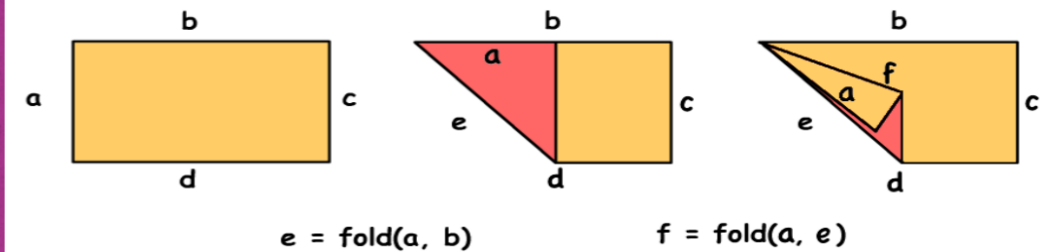
Please note that the paper remains on the table during folding, and that the length of the side `b` is twice the length of the side `a`.

How does the paper rectangle `(a, b, c, d)` look like after the execution of these three commands?

`e = fold(c, a);`   `f = fold(c, d);`   `g = fold(a, f);`

A   B   C   D

**9th International
Bebras Task Workshop**
Torún, Poland

2013
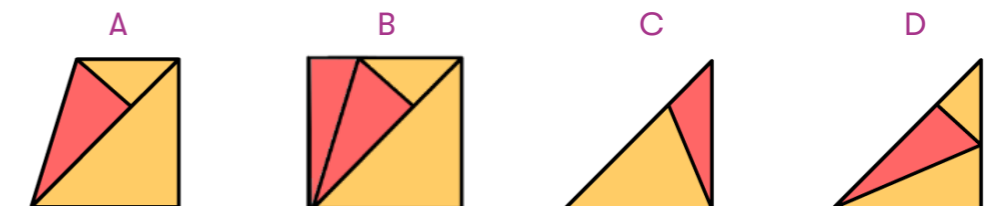
Austria
Czechia
Estonia
Germany
Israel
Italy
Latvia
Lithuania
Netherlands
Poland
Slovakia
Switzerland
Ukraine
Belgium
Bulgaria
Canada
Cyprus
Egypt
Finland
France
Hungary
Ireland
Japan
New Zealand
Russia
Serbia
Slovenia
Spain
Sweden
Taiwan

Airport

2013-AT-04

The airport porter is loading the passengers' bags on the moving luggage belt. He always puts the next bag on the third next empty place until all five bags are placed on the luggage belt.
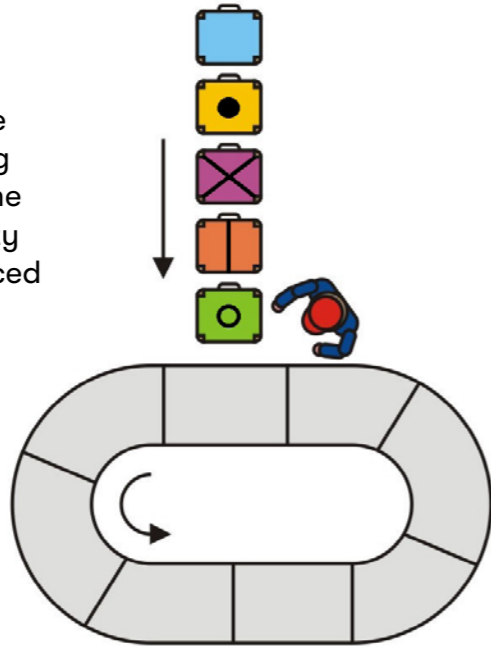
How does the luggage belt appear at the end of his work?

A

B

C

D
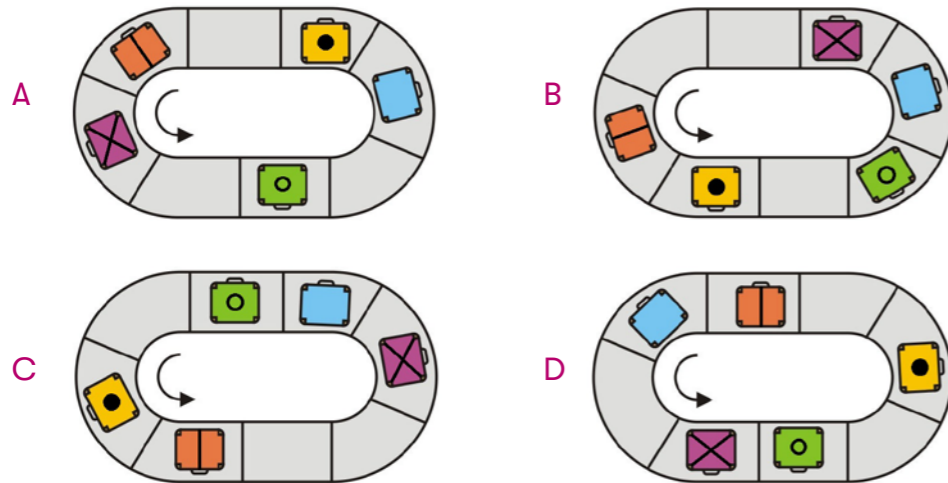
Signal fire

2013-JP-07

A long time ago in Japan, some Ninjas served the shogunate government. In case of emergency, they used smoke signals to communicate with each other.
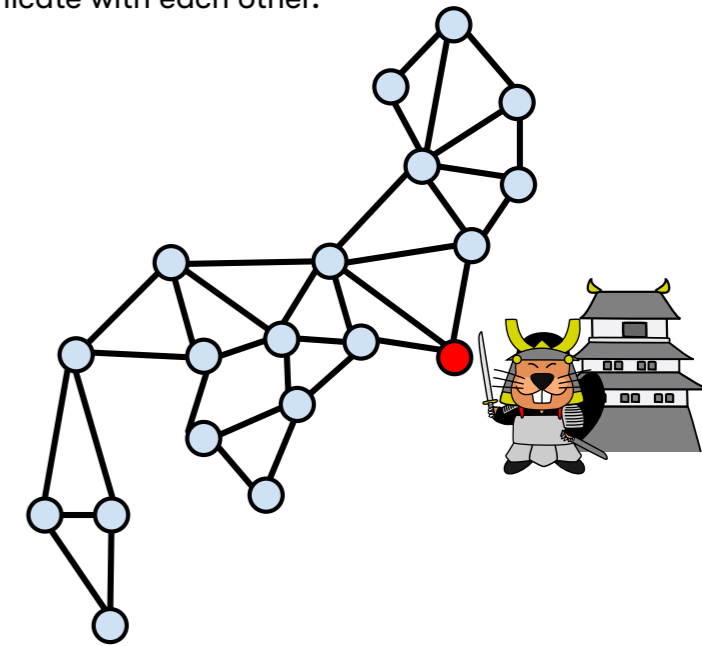
In the above figure, the red point is the location of the shogunate government. Each blue point is a location where a smoke signal should be lit. Also, two points are joined by a line if their smoke signals can be seen from each other. At every point, there are some Ninjas who stand on watch all day long. When they see a signal from a point joined to theirs, they light their own signal after just 1 minute.

When the government lights a signal, how much later will signals be lit at all points?

A 4 minutes   B 5 minutes   C 6 minutes   D 8 minutes

**10th International
Bebras Task Workshop**
Vilnius and Druskininkai, Lithuania
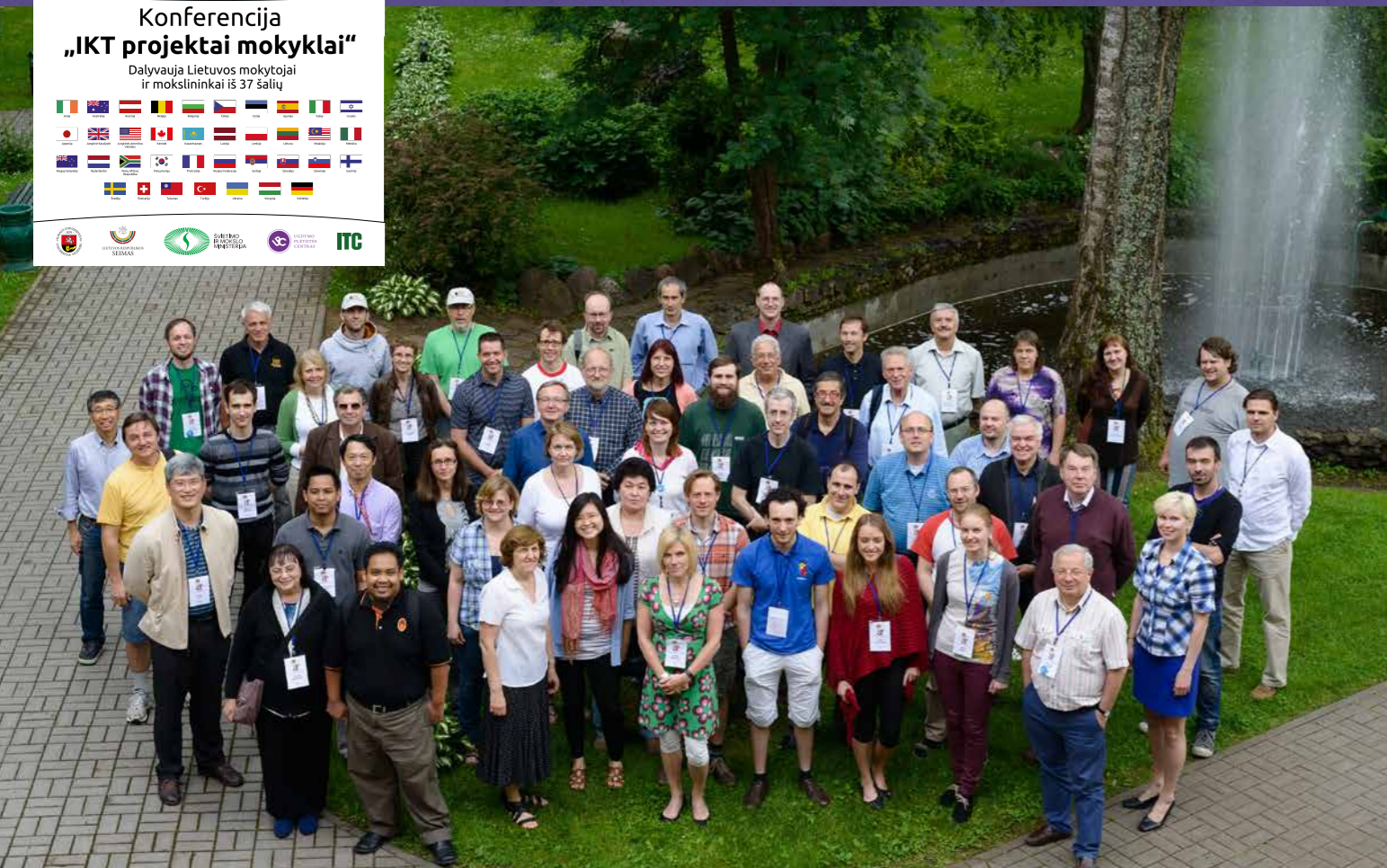
2014

Austria
Canada
Czechia
Estonia
Finland
France
Germany
Hungary
Israel
Italy
Japan
Latvia
Lithuania
Netherlands
Poland
Slovakia
Slovenia
Switzerland
Ukraine
Australia
Belgium
Bulgaria
Cyprus
Egypt
Ireland
New Zealand
Russia
Serbia
South Africa
Spain
Sweden
Taiwan
United Kingdom

In 2014, BEBRAS received the WITSA Merit Award from the World Information Technology and Services Alliance for its collaborative international network. This network seeks to promote informatics among primary, secondary, and high school students and teachers, attracting school age children, especially girls to science and technology, and engaging them in computer science, engineering, and mathematics.

Funny windows
2014-CA-05

Boat glasses are either clear or lightly tinted. When looking through two such glasses, one will see either clear, lightly tinted or darkly tinted glass as shown below.
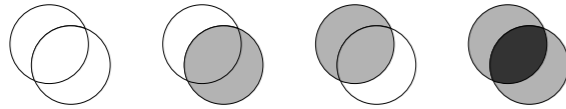
Captain Black installs circular windows with either clear or lightly tinted glasses into the below deck of his new yacht as shown below. When standing at appropriate places on land, one can see through two corresponding windows on the opposite sides of the yacht.

Left side of the yacht

Right side of the yacht
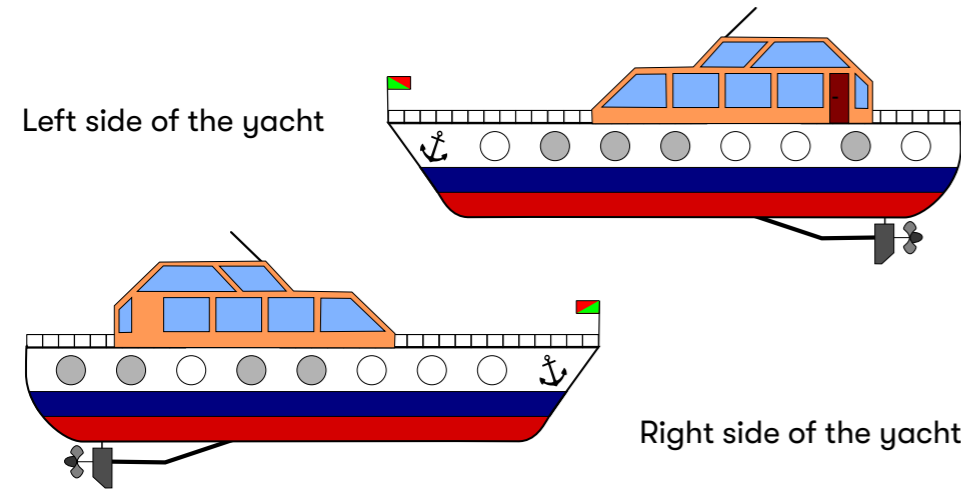
What colors does one see when looking through the corresponding windows ?

A ⚓ ● ● ○ ● ● ○ ● ●
B ⚓ ○ ● ● ● ● ○ ● ●
C ⚓ ○ ● ● ● ● ● ● ●
D ⚓ ○ ● ● ● ● ○ ● ○

Robust Network
2014-HU-02

The Beaver TeleCompany wants to place cellphone towers on Windy Island.

A cellphone tower's coverage area is a circle centered around it. Two towers are connected if their coverage areas overlap. Furthermore, two towers can communicate through a sequence of towers where consecutive towers are connected.

The wind on the island often breaks towers. With any one tower broken, it must be possible for any two of the remaining towers to communicate.

Of the choices below, how should the towers be placed?

A
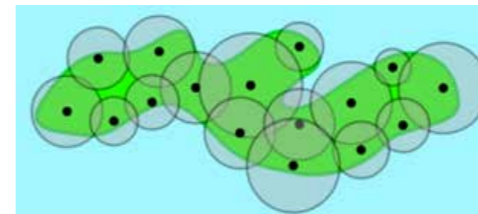
B
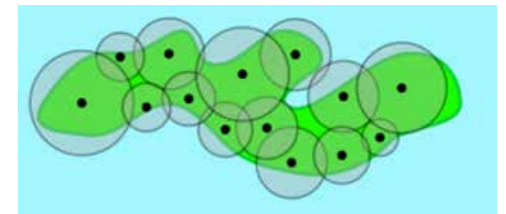
C
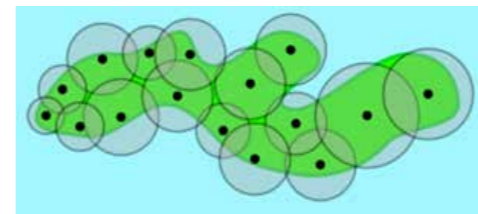
D
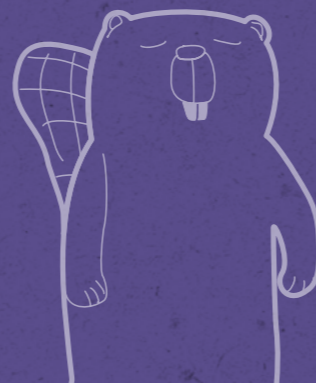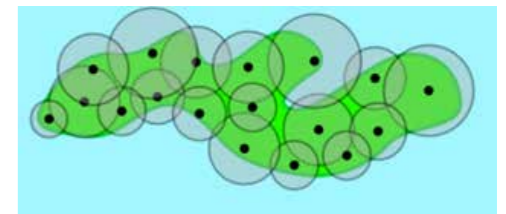
11th International Bebras Task Workshop
St. Pölten, Austria

2015

The winner of the Informatics Europe 2015 Best Practices in Education Award is the Bebras "International Challenge on Informatics and Computational Thinking".

The Award organised annually by Informatics Europe was presented at a special ceremony held in Vienna, Austria, during the European Computer Science Summit.

Austria
Belgium
Canada
Czechia
Estonia
Finland
France
Germany
Hungary
Israel
Italy
Japan
Latvia
Lithuania
Netherlands
Poland
Russia
Slovakia
Slovenia
Switzerland
Taiwan
Ukraine
Australia
Azerbaijan
Bulgaria
Cyprus
Egypt
Iceland
Iran
Kazakhstan
Malaysia
New Zealand
North Macedonia
Pakistan
Serbia
South Africa
Spain

Sweden
Türkiye
United Kingdom
USA

Fireworks

Two beavers live in lodges separated by a large forest. They decide to send messages to each other by shooting fireworks into the sky above the trees. Each message is a sequence of words, though the beavers only know five of them. So they shoot two types of fireworks one after the other according to the following code.

Word	Code
log	
tree	
rock	
river	
food	

For example, to send the (strange) message "food, log, food", a beaver would shoot:

How many different meanings does the following sequence of fireworks have?

A 0   B 1   C 2   D 3   E 4

Animation

B-taro is planning an animation, which shows a sequence of pictures of a face. The animation should run smoothly. Therefore, the order of the pictures is correct, if only one attribute of the face changes from one picture to the next.
Unfortunately, the pictures got mixed up. Now B-taro must find the correct order again. Luckily, he knows which picture is last. He labels the five other pictures with letters A to E.
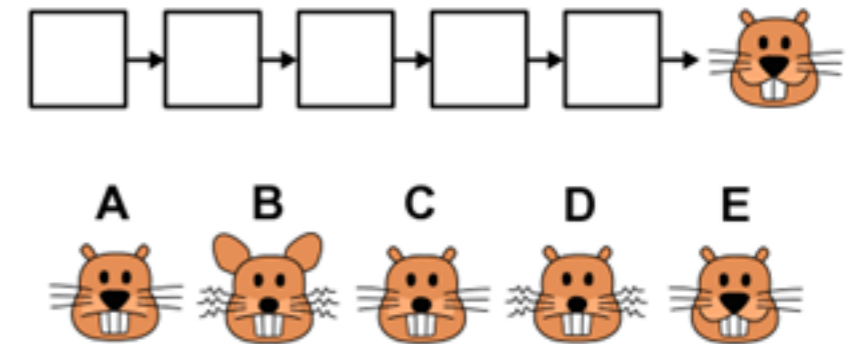
What is the correct order of the five other pictures?

A D → B → E → C → A
B C → B → D → A → E
C D → B → C → E → A
D B → D → C → A → E

12th International Bebras Task Workshop
Bodrum, Türkiye

2016

Austria
Azerbaijan
Belgium
Bulgaria
Canada
Cyprus
Czechia
Estonia
Finland
France
Germany
Hungary
Iceland
Iran
Israel
Italy
Japan
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Poland
Russia
Slovakia
Slovenia
South Africa
Spain
Sweden
Switzerland
Taiwan
Türkiye
Ukraine
United Kingdom
USA
Australia

Belarus
Bosnia and
 Herzegovina
Croatia
Egypt
Indonesia
Ireland
Kazakhstan
Latvia
Romania
Serbia
Singapore
South Korea
Vietnam

Bebras Indonesia Challenge
http://bebras.or.id

SERENTAK PADA
HARI SELASA
TANGGAL 8 NOVEMBER 2016
PUKUL 8.30 - 10.00 WIB

APA ITU BEBRAS CHALLENGE?

Tantangan bagi para siswa SD, SMP, dan SMA secara online untuk mengedukasi kemampuan *problem solving* yang di dalamnya terkandung konsep *computational thinking* (informatika).

Bebras task disajikan dalam bentuk uraian persoalan yang dilengkapi dengan gambar yang menarik agar mudah dipahami oleh siswa.

KATEGORI

Siaga: untuk siswa SD
Penggalang: untuk siswa SMP
Penegak: untuk siswa SMA

Informasi pendaftaran dan pelaksanaan dapat dilihat di **http://bebras.or.id** dan untuk latihan *Bebras Challenge berbahasa Indonesia* di **https://olympia.id**

Diselenggarakan oleh:
**Tim Olimpiade Komputer Indonesia**

L-Game
2016-TW-07a

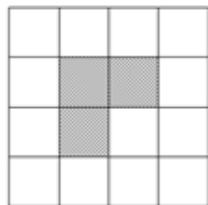Kiki and Wiwi are playing L-Game on a 4x4 board. They take turns placing L-shaped pieces so that

• every piece placed by Kiki is oriented as shown below,
• every piece placed by Wiwi is oriented as shown below,
• every piece is placed entirely on the board, and
• no two pieces overlap.

Pieces cannot be moved after they are placed. A player loses the game when it is their turn but it is not possible to place a piece according to the rules above. Kiki goes first as shown below.
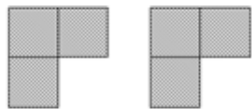
Kiki's orientation   Kiki's first turn   Wiwi's orientation

Which of the following statements is true no matter how pieces are placed in future turns?

A Kiki will definitely win the game.
B Wiwi will definitely win the game.
C Kiki will probably win the game but Wiwi might win the game.
D Wiwi will probably win the game but Kiki might win the game.

Let your heart talk
2016-DE-04

The service robot is able to recognize four basic emotions: neutral, disgusted, surprised and happy.
When the robot talks to the beaver, it observes the beaver's face and decides what to say next depending on the beaver's facial expression. Here is a little conversation between the robot and the beaver. The robot talks and the beaver reacts emotionally with facial expressions.

neutral   disgusted   surprised   happy
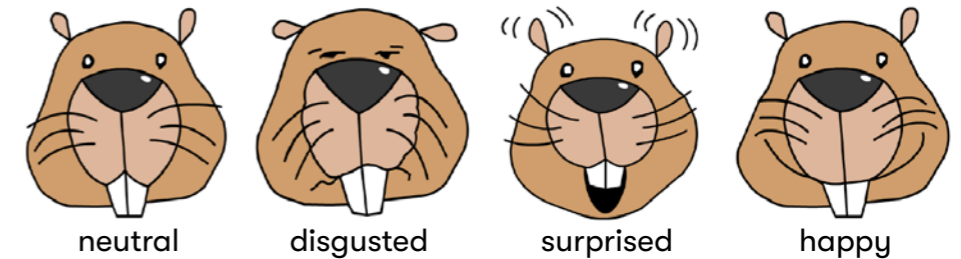
Connect each red dot an appropriate face and make this a reasonable conversation between beaver and machine. Each face can be used only once.

Wake up! Your beloved aunt Tilly is arriving.

I know, she is way too early. Do you want me to prepare drinks – say duckweed cocktails?

I forgot, you do not like duckweed. Do you want me to prepare tea instead?

So, this seems to be a better idea. I will make hot water for the tea. Is black tea alright?

Well, I can later ask Aunt Tilly what she wants to drink.

13th International Bebras Task Workshop
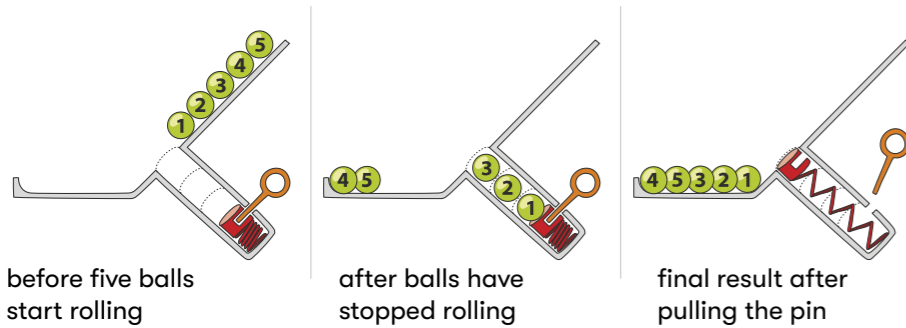Brescia, Italy

2017

In memoriam
Ries Kock

Australia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
Cyprus
Croatia
Czechia
Estonia
Finland
France
Germany
Hungary
Iceland
Indonesia
Iran
Ireland
Israel
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Poland
Romania
Russia
Serbia
Singapore
Slovakia

Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Türkiye
Ukraine
United Kingdom
USA
Brazil
China
Egypt
Jordan
Kazakhstan
Malta
Mongolia
Nigeria
Portugal
Tunisia
Vietnam

Balls

2017-RS-02

Numbered balls roll down ramps. The order of the balls changes as they fall into holes. When a ball comes to a hole, if there is enough space, the ball falls in. Otherwise, the ball rolls past the hole. A pin at the bottom of each hole can be pulled which ejects the balls. Here is an example:

before five balls start rolling

after balls have stopped rolling

final result after pulling the pin

Ten balls roll down the ramp below. Three holes A, B and C have space for 3, 2 and 1 balls as shown. Pins are pulled in the order A, B, C but each time, only after all balls have stopped rolling.
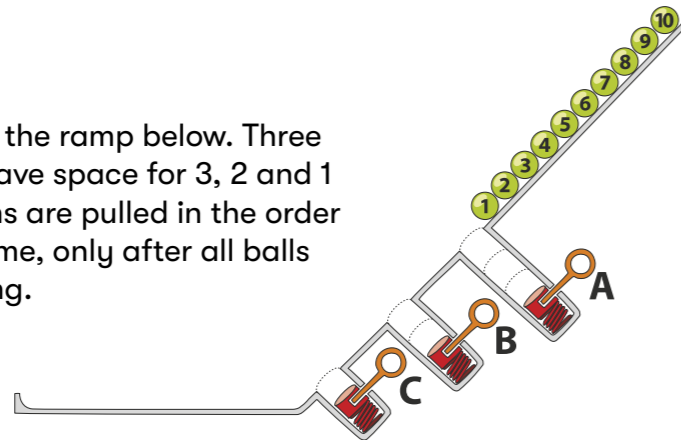
Which of the following is the final result?

A 7 8 9 10 1 2 3 4 5 6

B 7 8 9 10 1 2 3 5 4 6

C 10 9 8 7 6 5 4 3 2 1

D 7 8 9 10 3 2 1 5 4 6

Arabot's walk

2017-CZ-04c

An Arabot is a robot walking on a piece of paper. It's always following the black lines drawn on the paper. On every line there is a label, which tells it to turn left (L) or right (R) at the next intersection (✗). Some labels are already chosen, but for rest of some labels you must choose. Jane lets the Arabot start at the places A, B or C.

The Arabot needs to be recharged quite often, so whenever she starts it, she wants it to end up at the charging station (⚡), where it can recharge. If it ends up at places A, B or C, it doesn't know how to continue and turns itself off.
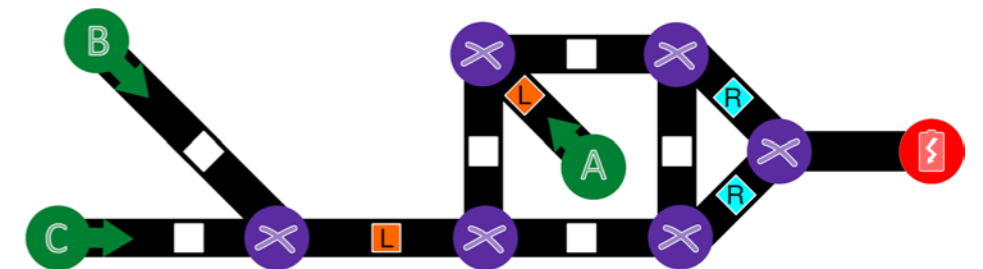
Help Jane to choose the correct labels for the lines so that the Arabot always ends up at the charging station (⚡).
Choose the labels so that the Arabot will always reach its charging station.

**14th International
Bebras Task Workshop**
Protaras, Cyprus

2018

Australia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
Cyprus
Croatia
Czechia
Egypt
Estonia
Finland
France
Germany
Hungary
Iceland
Indonesia
Iran
Ireland
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Poland
Romania
Russia
Serbia
Slovakia
Slovenia
South Africa

South Korea
Spain
Sweden
Switzerland
Taiwan
Türkiye
Ukraine
United Kingdom
USA
Algeria
Brazil
Cambodia
China
Dominican Republic
El Salvador
Greece
Hong Kong
Israel
Jordan
Kazakhstan
Malta
Mongolia
Morocco
Nigeria
Norway
Palestine
Portugal
Thailand
Tunisia
Vietnam

Previous Bebras tasks can be found on many
countries' websites as Bebras brochures.

Pizza

2018-IT-05

Lucilla is learning how to use a fork. Her mummy explains that the rules for eating pizza are:
• Pieces with crust should be taken using hands.
• Pieces without crust should be taken using a fork.

How many pieces Lucilla should take using her fork?

Snake Samba

2018-AU-04

Sally the snake is coming up with a dance.

Which image comes next in the dance?

A	B	C	D
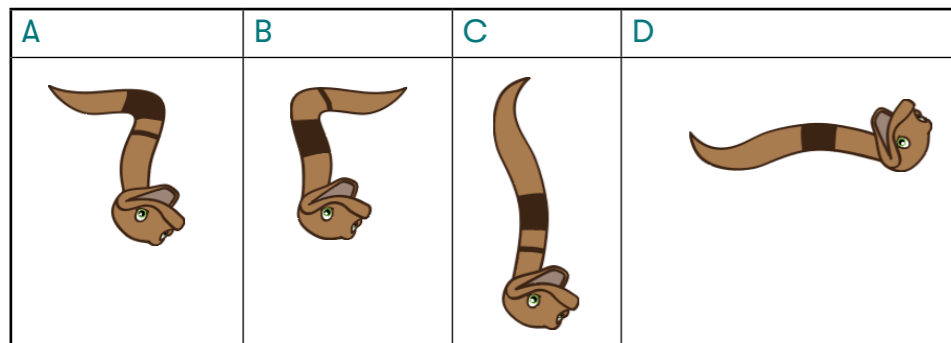
Two beavers are working

2018-LT-04

Two beavers are building a dam and need to do 8 tasks (cut trees, remove branches, float wood, assemble trunks, etc.): A(2), B(3), C(5), D(7), E(10), F(9), G(4), H(6). Each number in brackets indicates the number of hours to do that task. Some tasks must be completed before others can be started, as shown by the arrows. The beavers work in parallel, taking different tasks each.
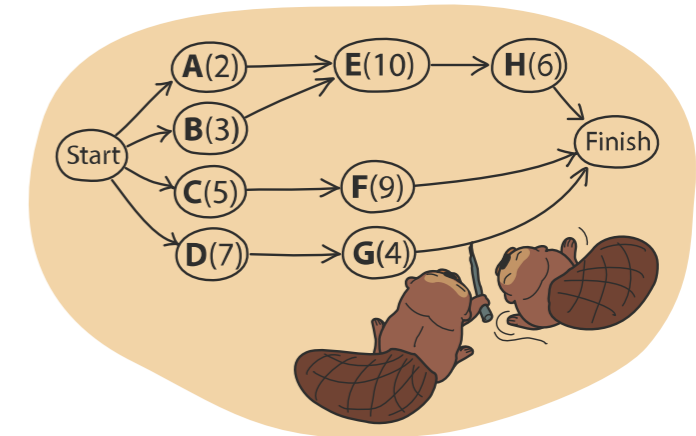
The beavers use the following plan: from among the tasks that are available at any moment they choose the biggest one. The beavers work on these tasks in this order:
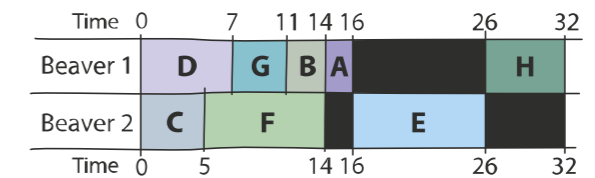
From this picture the beavers complete the dam in 32 hours. However, it is possible to complete the dam in a shorter time with a different plan.

What is the shortest time for two beavers to build the dam?

# 15th International Bebras Task Workshop
Balatonkenese, Hungary

2019

Australia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
China
Cyprus
Croatia
Czechia
Egypt
Estonia
Finland
France
Germany
Hungary
Iceland
Indonesia
Iran
Ireland
Israel
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Poland
Romania
Russia
Serbia
Singapore

Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
Türkiye
Ukraine
United Kingdom
USA
Vietnam
Algeria
Brazil
Cambodia
Dominican Republic
El Salvador
India
Jordan
Kazakhstan
Malta
Mongolia
Morocco
Niger
Nigeria
Norway
Palestine
Philippines
Portugal
Saudi Arabia
Syria
Tunisia
Uruguay
Uzbekistan

Scratch art paper

2019-KR-01

You can draw a pretty picture by scratching with a sharp object on scratch art paper:
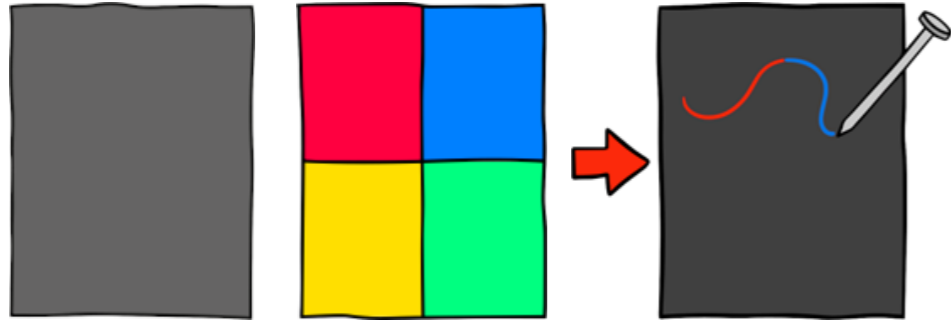
Initially we see the black scratch art paper.

These four colors are hidden behind the paper.

When you scratch it with a pointed object, the color behind it appears.

Which of the following scratch art pictures will show exactly three colors?

A	B	C	D
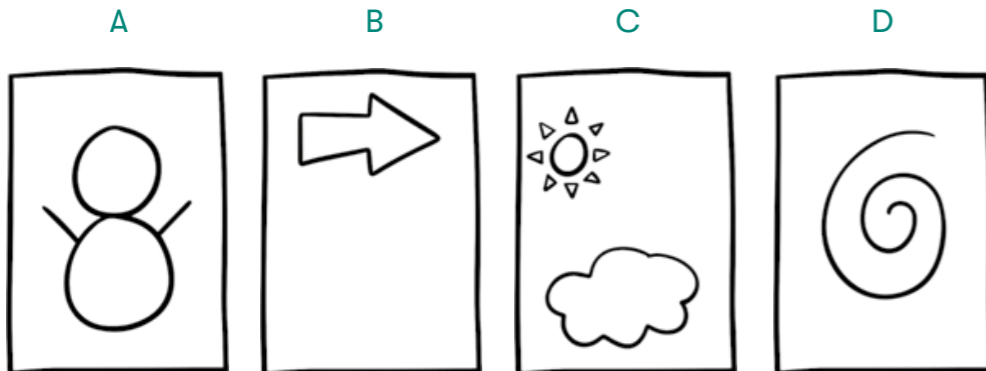
Wood allergies

2019-SI-02

For some beavers, eating some types of wood will make them sick. Ann is making dishes out of wood for a party and wants to make sure that everyone will be able to eat without getting sick. Each dish is made from one type of wood and beavers are happy to share dishes. Ann has a list of the beavers attending the party, and the types of wood that they can eat without getting sick.

Name	Wood
Ann	Willow, Oak, Ash, Maple
Benjamin	Willow, Oak, Poplar
Cecil	Oak
Danny	Ash, Birch
Emma	Willow, Maple, Birch
Fred	Oak, Ash
George	Poplar, Maple

Ash   Maple   Oak

Birch   Poplar   Willow

Ann does not want to have to make dishes out of all six different types of wood.

What is the minimum number of dishes Ann can bring to the party so everyone can eat without getting sick?
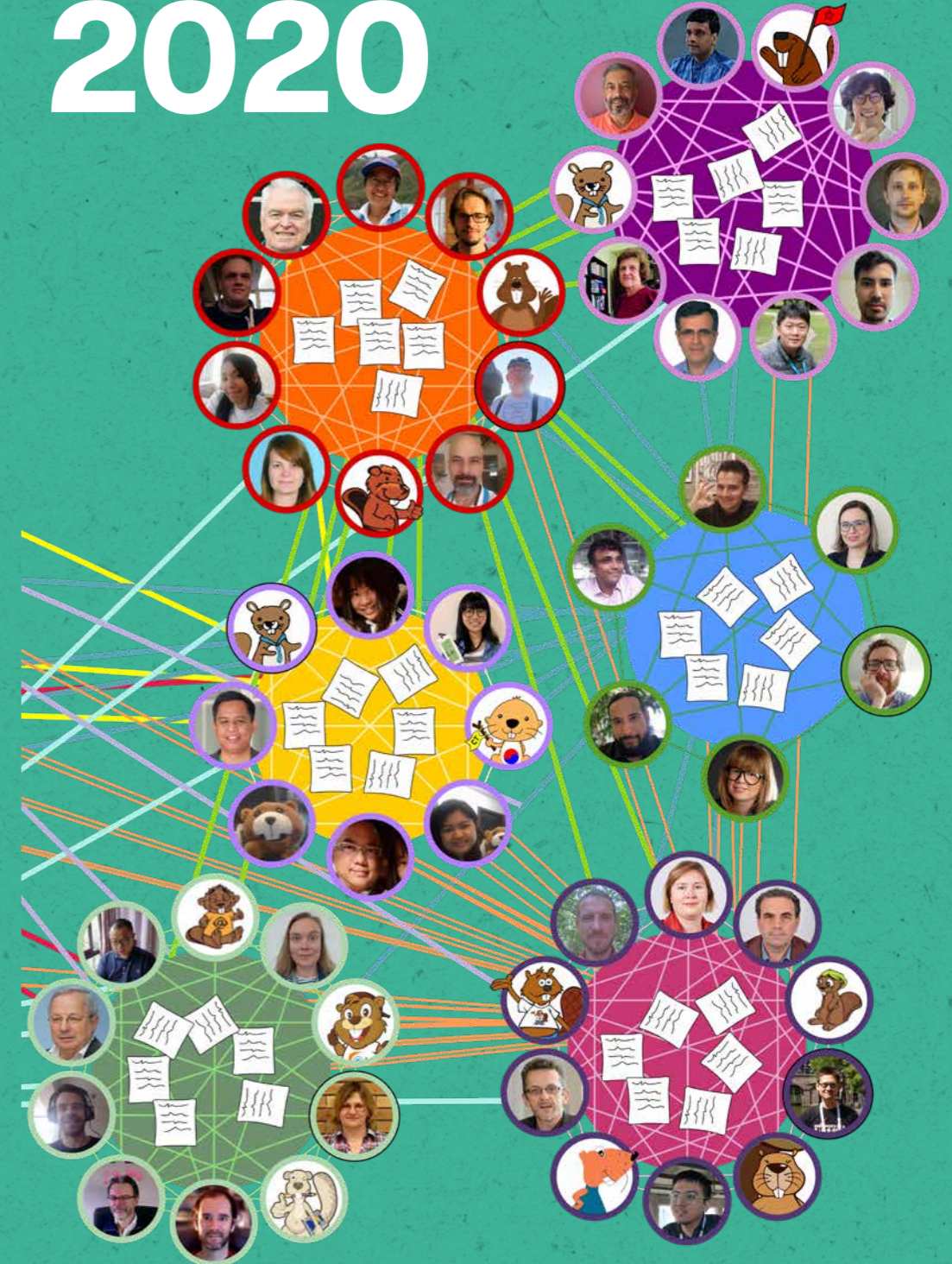
A 1   B 2   C 3   D 4   E 5   F 6

16th International Bebras Task Workshop (virtual)

Daejeon, South Korea

2020

Australia	Serbia
Austria	Slovakia
Azerbaijan	Slovenia
Belarus	South Africa
Belgium	South Korea
Bosnia and	Spain
Herzegovina	Sweden
Bulgaria	Switzerland
Canada	Taiwan
China	Thailand
Cyprus	Türkiye
Croatia	Ukraine
Czechia	United Kingdom
Egypt	USA
Estonia	Vietnam
Finland	Algeria
France	Cambodia
Germany	Dominican Republic
Hungary	El Salvador
Iceland	Kazakhstan
India	Morocco
Indonesia	Niger
Iran	Norway
Ireland	Palestine
Italy	Philippines
Japan	Saudi Arabia
Latvia	Syria
Lithuania	Uruguay
Malaysia	Uzbekistan
Netherlands	
New Zealand	
North Macedonia	
Pakistan	
Poland	
Portugal	
Romania	
Russia	

Collage of Susanne Datzko, Switzerland

Beavers vs. kangaroos

2020-LT-05

While crossing a swamp by using a log path, five beavers meet a group of kangaroos going in the opposite direction. Nobody wants to get wet or dirty so they stay on the path. The Kangaroos found out that from one specific log it is possible to jump onto a stone next to the log path and jump back to that one log. However, only one kangaroo can stand on the stone at a time.
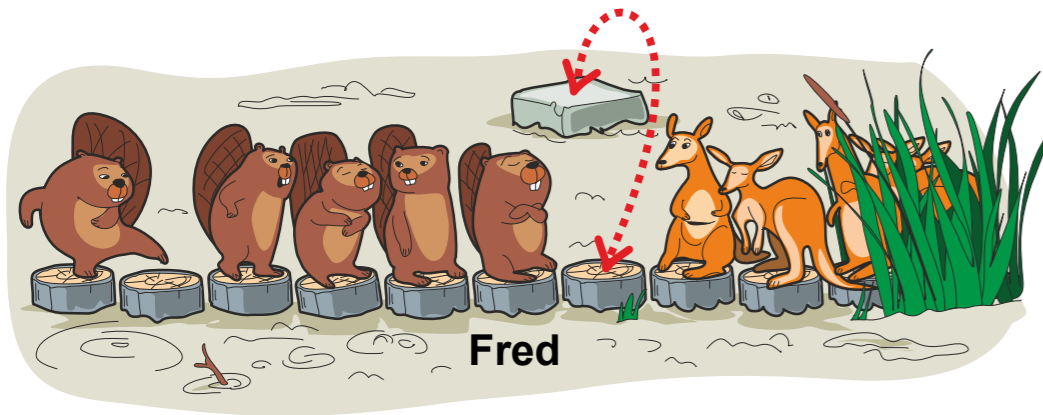
Fred

The beavers don't mind going all the way back, except for Fred, the leading beaver, who is the first to meet the kangaroos. Fred only agrees to take a step back at most 10 times.

With Fred's behaviour, how many kangaroos can pass him without taking a step back?

A More than 10 kangaroos can pass Fred.
B Exactly 10 kangaroos can pass Fred.
C Exactly 6 kangaroos can pass Fred.
D Exactly 4 kangaroos can pass Fred.
E Less than 4 kangaroos can pass Fred.
F It is not possible to determine.

Train tracks

2020-PT-06

Can you help guiding the train to the station?
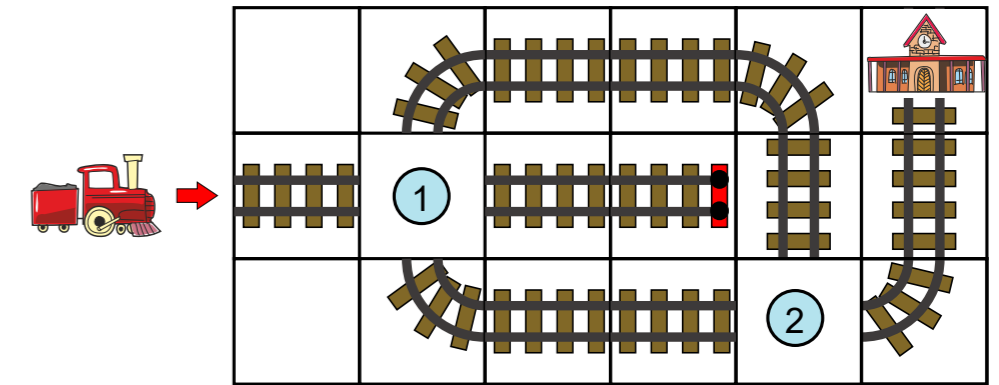
Which of the following choices of tracks for each position would make the train arrive safely to the station?

In memoriam
Peter Tomcsányi

**17th International
Bebras Task Workshop** (virtual)
Druskininkai, Lithuania

2021

Australia
Austria
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
China
Cyprus
Croatia
Czechia
Egypt
Estonia
Finland
France
Germany
Hungary
Iceland
India
Indonesia
Iran
Ireland
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Poland
Portugal
Romania
Russia
Serbia

Singapore
Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
Türkiye
Ukraine
United Kingdom
USA
Vietnam
Algeria
Cambodia
Cuba
Dominican Republic
El Salvador
Kazakhstan
Laos
Morocco
Niger
Norway
Palestine
Philippines
Saudi Arabia
Syria
Uruguay
Uzbekistan

Participation of students
2020-2021

|	
Algeria 16 184	32 107 Lithuania
Australia 54 920	18 245 Netherlands
Austria 19 741	2 614 New Zealand
Belarus 166 038	19 263 Macedonia
Belgium 3 369	3 336 Pakistan
Bosnia and Herzegovina 5 167	
Bulgaria 244	213 Philippines
Canada 15 462	10 074 Poland
China 39 869	17 496 Portugal
Cyprus 1 085	7 194 Romania
Croatia 36 491	8 756 Russia
Czechia 61 788	6 527 Saudi Arabia
Egypt 2 300	28 187 Serbia
Estonia 3 354	55 064 Slovakia
Finland 4 307	18 955 Slovenia
France 523 598	63 897 South Korea
Germany 381 580	30 994 Switzerland
Hungary 29 341	159 039 Taiwan
Iceland 2 504	14 776 Thailand
India 103 114	40 431 Turkey
Indonesia 16 186	49 317 Ukraine
Iran 5 371	240 803 United Kingdom
Ireland 9 533	3 593 Uruguay
Italy 14 519	47 470 USA
Japan 4 554	26 335 Uzbekistan
Latvia 14 896	24 787 Vietnam

Total participants
2 464 988

Spider Quilts

When Wanda sees an interesting web she uses it to design a new quilt. She numbers the web's anchor points from 1 to N and then arranges squares of fabric into an N-by-N grid as follows:
• For every piece of silk, if its anchors are numbered X and Y, she places two dotted fabric squares in her grid:
• One dotted fabric square is placed where row X and column Y meet.
• Another dotted fabric square is placed where row Y and column X meet.
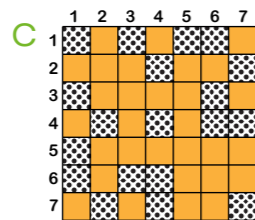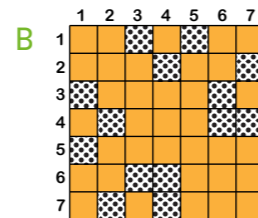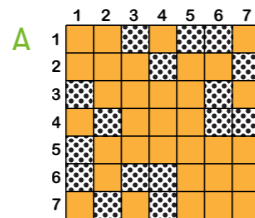• The rest of the grid is filled using solid fabric squares.
For example, the spider web on the left inspired the quilt on the right.
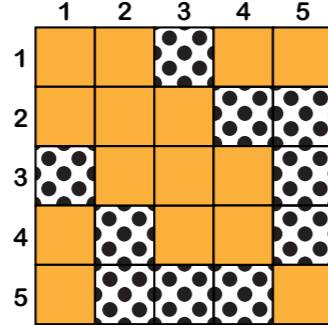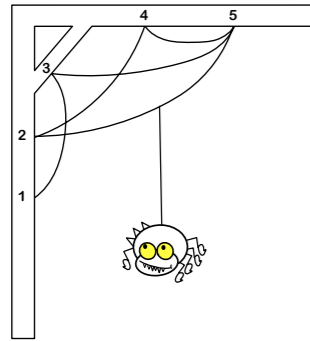
Wanda now sees the following web and wishes to design a new quilt:
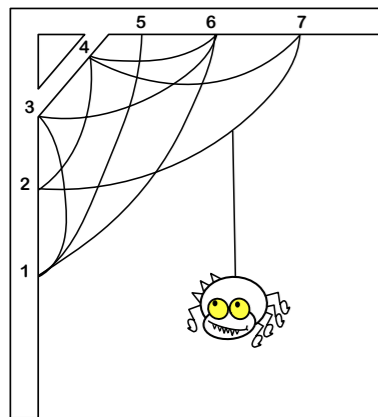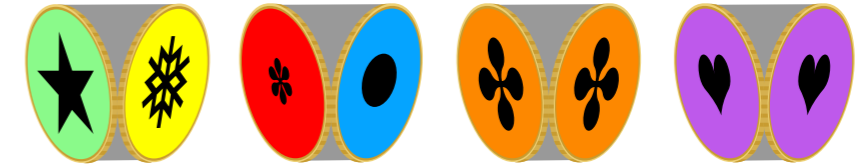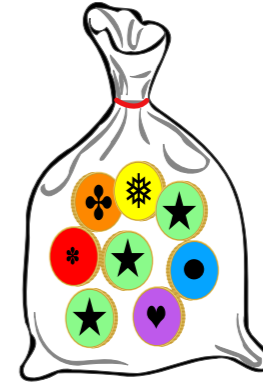

What might her quilt look like?
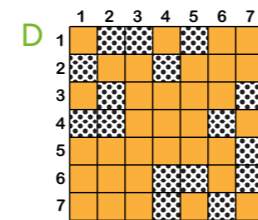
Coin bag

This is Saoirse's bag of coins. In Saoirse's country there are only four types of coins.
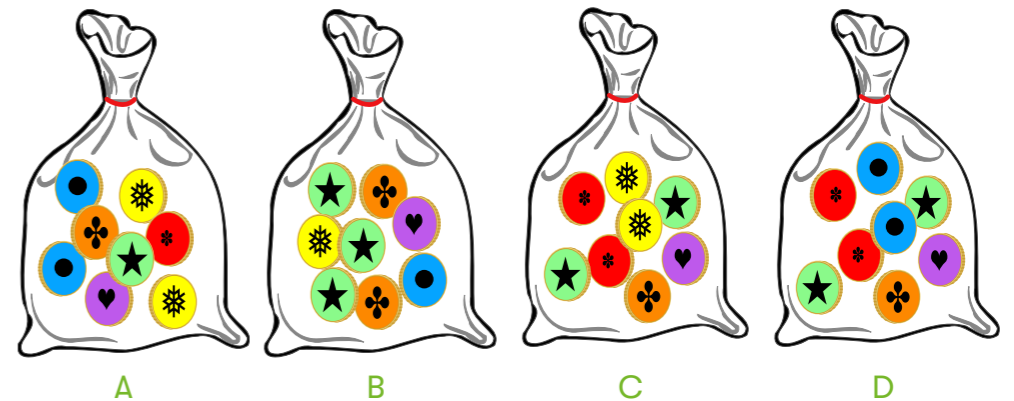The images below show both sides of each type of coin:

Her bag has been placed next to three other bags of coins after shaking while walking.

Which is Saoirse's bag of coins?

18th International Bebras Task Workshop
## Strumica, North Macedonia

2022

Algeria
Australia
Austria
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
China
Cyprus
Croatia
Czechia
Egypt
Estonia
Finland
France
Germany
Hungary
Iceland
India
Indonesia
Iran
Ireland
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Philippines
Poland
Portugal
Romania
Russia

Serbia
Singapore
Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
Türkiye
Ukraine
United Kingdom
Uruguay
USA
Uzbekistan
Vietnam
Argentina
Brazil
Cambodia
Colombia
Cuba
Dominican Republic
El Salvador
Israel
Jamaica
Kazakhstan
Laos
Montenegro
Morocco
Niger
Norway
Palestine
Saudi Arabia
Senegal
Syria

Bee hive
2022-FR-02

Beaver needs some help to place the bees in the hive.
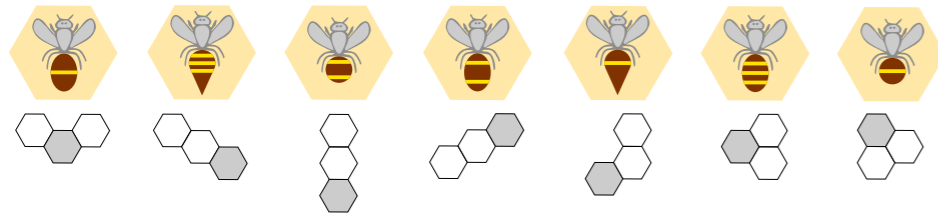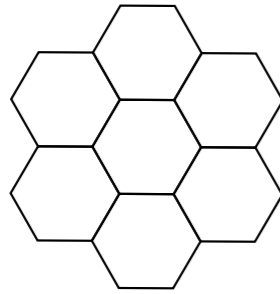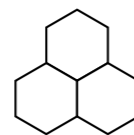

Below each bee a rule is shown: The bee must be put in the gray cell. Drag and drop the bees into the hive obeying their rules.
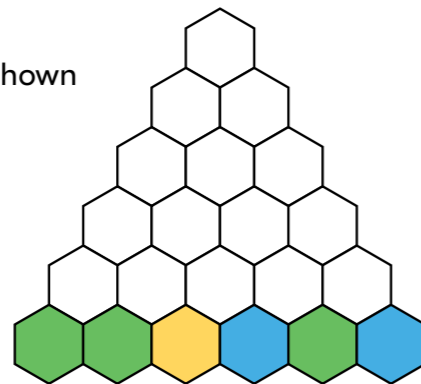
Colored tower
2022-VN-05

Sam has hexagonal puzzle pieces in three colors. When he places three pieces as shown, the three pieces must all be the same color or all different colors.

Sam places pieces in a tower shape as shown below. What must the top piece be?
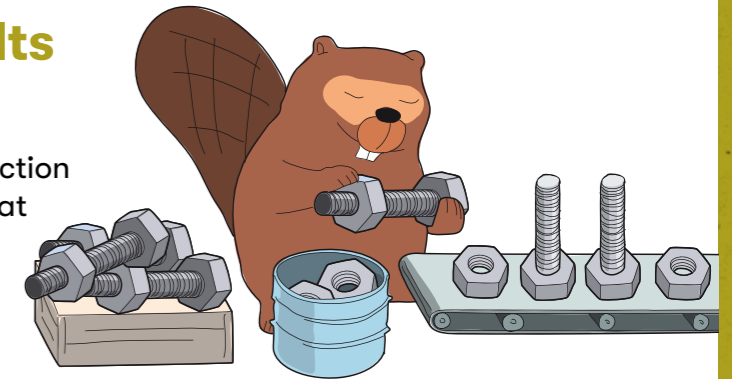
A   B   C   D

there is more than one possibility

Nuts and bolts
2022-CA-06

At the Beaver Construction factory, Benoit works at the nuts and bolts assembly line.
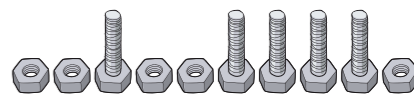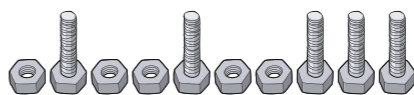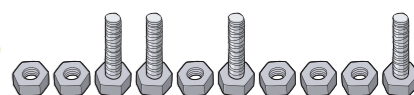
His job description is as follows:
• Benoit stands at one end of a long conveyor belt, which contains a line of nuts and bolts.
• Benoit's job is to take each element, either a nut or a bolt, off of the conveyor belt.
• If Benoit takes a nut from the conveyor belt, he puts it in the bucket beside him.
• If Benoit takes a bolt from the conveyor belt, he grabs a nut from the bucket beside him, attaches the nut and bolt together, and places the assembled part onto large box.

However, things can go wrong for Benoit in two different ways:
1. If Benoit takes a bolt from the conveyor belt, and there is no nut in the bucket to attach.
2. If there are no more nuts or bolts on the conveyor belt, and there are still nuts in the bucket.

Which sequence of nuts and bolts, when processed from left-to-right, will not cause things to go wrong for Benoit?

A

B

C

D

19th International Bebras Task Workshop
Hurghada, Egypt
2023

Algeria
Australia
Austria
Belarus
Belgium
Bosnia and
 Herzegovina
Bulgaria
Canada
China
Cyprus
Croatia
Czechia
Egypt
Estonia
Finland
France
Germany
Hungary
Iceland
India
Indonesia
Iran
Ireland
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
North Macedonia
Pakistan
Philippines
Poland
Portugal
Romania
Russia
Saudi Arabia
Serbia

Singapore
Syria
Slovakia
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
Türkiye
Ukraine
United Kingdom
Uruguay
USA
Uzbekistan
Vietnam
Argentina
Azerbaijan
Brazil
Cambodia
Colombia
Cuba
Dominican
 Republic
El Salvador
Israel
Jamaica
Kazakhstan
Laos
Montenegro
Morocco
Niger
Norway
Palestine
Paraguay
Peru
Puerto Rico
Senegal

https://bit.ly/3U1JzEB

On December 8th, 2023, establishment contract of the BEBRAS INTERNATIONAL association was signed at Vilnius University, Lithuania. The establishment of the association was endorsed by representatives of five institutions who met in person and signed the document: Vilnius University Rector Rimvydas Petrauskas, Professor Javier Jesus Bilbao Landache from University of the Basque Country, Eljakim Schrijvers, Director of the Computer Science Olympiad Foundation, the Netherlands, Professor Sébastien Combéfis, Founder of the organisation "Computer Science and IT in Education ASBL", Belgium, and Professor Jiří Vaníček from the South Bohemian University, Czechia.


The Bebras Challenge was presented by Lithuania among other solution developers, businesses and start-ups at the BETT (British Education and Training Technology) international exhibition in London 29-31 March 2023.

Closer or further

Daniel is playing a game to find out where a treasure was buried in a grid of squares. Daniel begins from a starting square denoted as S and he can move a step at one time only horizontally or vertically to the neighbor squares. After each step, Daniel receives a signal indicating whether he is closer (C) to or further away (F) from the treasure, where the distance to the treasure is the minimum number of steps needed to reach it.

For example, on the 3×3 grid shown below, the treasure is buried under the square marked ★ . Daniel goes forward two steps following the arrows. The distances from the two squares to the treasure are shown below on the right. Daniel gets the signals "C" and "F", respectively, after each step.
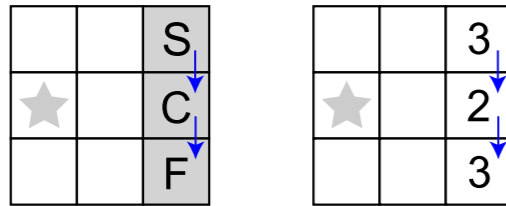
Now, Daniel is given another 4×7 grid, where his path follows the arrows and the obtained signals are also reported. Then, Daniel is given a hint that the treasure is buried under one of the five numbered squares.
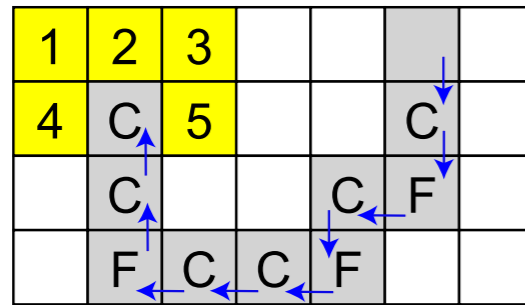
Under which numbered square the treasure was buried?

Unloading

A freight train has wagons, each with a numbered box. A single crane is used for unloading. The crane is at a fixed position. To unload a box, the box has to be positioned directly below the crane. The boxes have to be unloaded in order starting from 1. The train can move only forward. It is on a circular track, so it can go around the track and return so more boxes can be unloaded by the crane.
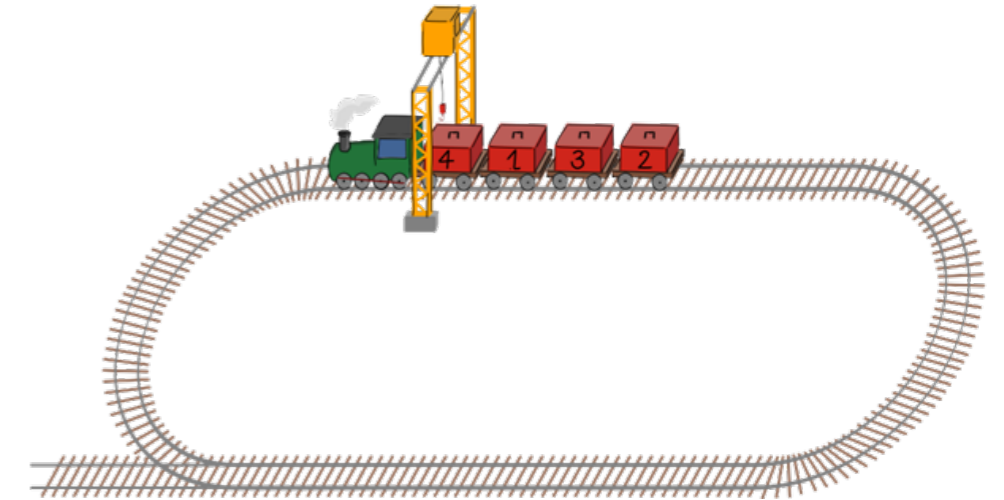
In the example above, the boxes have to be unloaded in the sequence of 1, 2, 3, 4. In the first round of unloading, the train skips box 4, unloads box 1, skips box 3, and unloads box 2. In the second round, it skips box 4 and unloads box 3. The train has to come back for a third round and unloads the final box, number 4.

How many rounds will be needed to unload all the boxes from the following train?
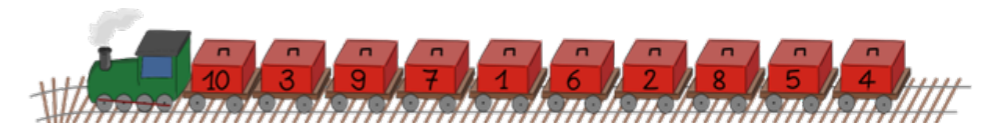
2024

20th International Bebras Task Workshop
Vrnjačka Banja, Serbia

Members: 57 countries; provisional members: 30.
Total participants from November 2023 to April 2024: 3 936 642 (in 71 countries)

Participation 2023/2024

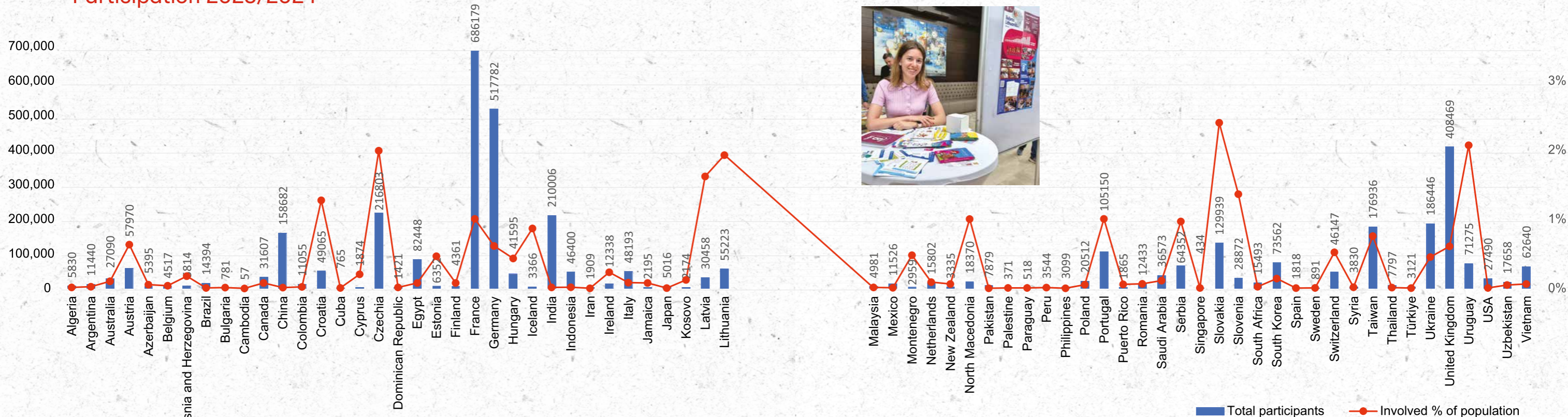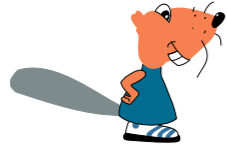|	Total participants	Involved % of population
Algeria	5830	
Argentina	11440	
Australia	27090	
Austria	57970	
Azerbaijan	5395	
Belgium	4517	
Bosnia and Herzegovina	814	
Brazil	14394	
Bulgaria	781	
Cambodia	57	
Canada	31607	
China	158882	
Colombia	11055	
Croatia	49065	
Cuba	765	
Cyprus	1874	
Czechia	216803	
Dominican Republic	1421	
Egypt	82448	
Estonia	635	
Finland	4361	
France	686179	
Germany	517782	
Hungary	41595	
Iceland	3366	
India	210006	
Indonesia	46400	
Iran	1909	
Ireland	12338	
Italy	48193	
Jamaica	2195	
Japan	5016	
Kosovo	2174	
Latvia	30458	
Lithuania	55223	
Malaysia	4981	
Mexico	11526	
Montenegro	29591	
Netherlands	15802	
New Zealand	3335	
North Macedonia	18370	
Pakistan	879	
Palestine	371	
Paraguay	518	
Peru	3544	
Philippines	3099	
Poland	20512	
Portugal	105150	
Puerto Rico	1865	
Romania	12433	
Saudi Arabia	36573	
Serbia	64357	
Singapore	434	
Slovakia	129939	
Slovenia	28872	
South Africa	15493	
South Korea	73562	
Spain	1818	
Sweden	891	
Switzerland	46147	
Syria	3830	
Taiwan	176936	
Thailand	7797	
Türkiye	3121	
Ukraine	186446	
United Kingdom	408469	
Uruguay	71275	
USA	27490	
Uzbekistan	17658	
Vietnam	62640	

Legend: ■ Total participants ●— Involved % of population

Bebras logos

Afghanistan

Algeria

Argentina

Armenia

Australia

Austria

Azerbaijan

Belarus

Belgium

Bosnia and Herzegovina

Brazil

Bulgaria

Cambodia

Canada

China

Colombia

Costa Rica

Croatia

Cuba

Cyprus

Czechia

Denmark

Dominican Republic

Egypt

El Salvador

Estonia

Finland

France

Germany

Greece

Hungary

Iceland

India

Indonesia

Iran

Ireland

Israel

Italy

Jamaica

Japan

Kazakhstan

Kosovo

Laos

Latvia

Lithuania

Malaysia

Malta

Mexico

Montenegro

Morocco

Namibia

Netherlands

New Zealand

Niger

North Macedonia

Norway

Pakistan

Palestine

Paraguay

Peru

Philippines

Poland

Portugal

Puerto Rico

Romania

Russia

Saudi Arabia

Senegal

Serbia

Singapore

Slovakia

Slovenia

South Africa

South Korea

Spain

Sweden

Switzerland

Syria

Taiwan

Thailand

Türkiye

Ukraine

United Kingdom

Uruguay

USA
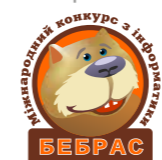
Uzbekistan

Vietnam

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BMK_