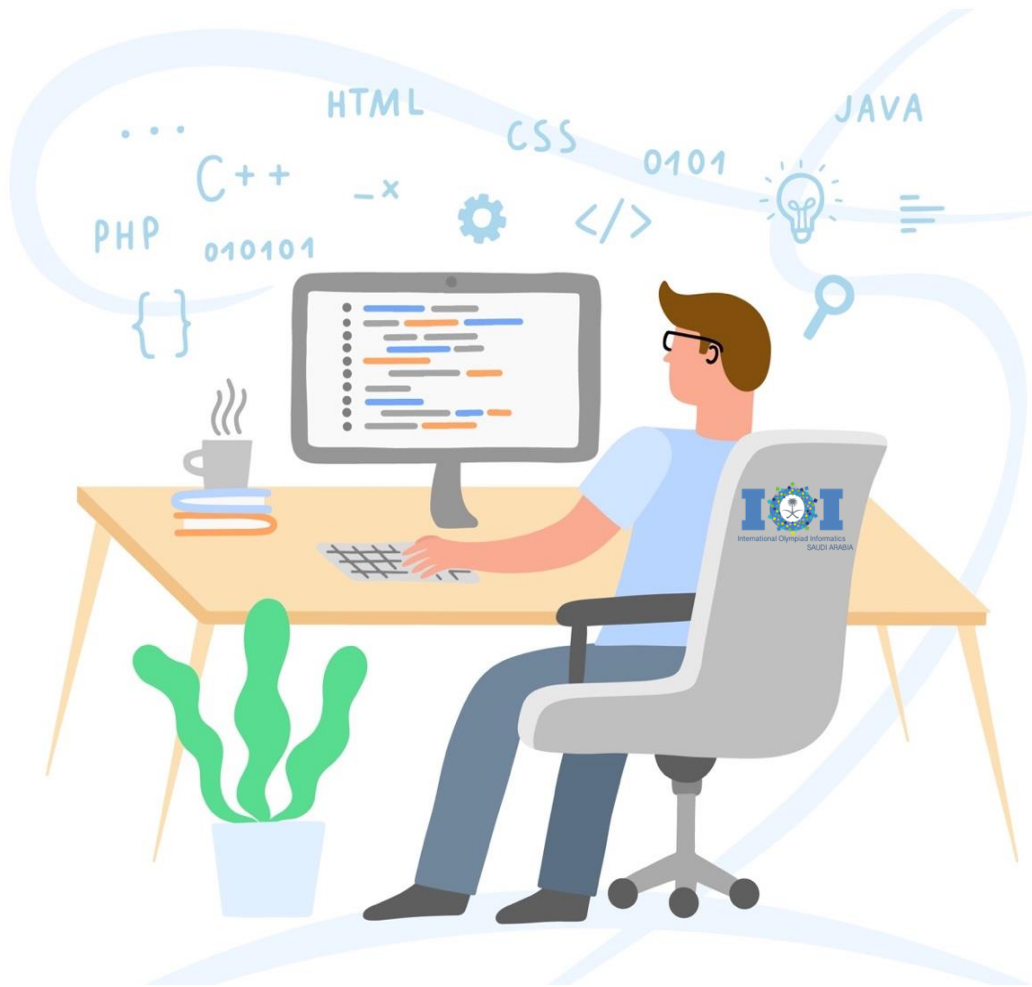


Guide to participation in the Mawhoob Competition –

Informatics Track



Prepared by: Saudi Informatics Team

بِسْمِ الرَّحْمَنِ الرَّحِيمِ



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Introduction

In line with the Kingdom's determination to achieve vision 2030 objectives that are primarily concerned with transforming into an innovative knowledgeable society and the strategic plans directed to achieve the goals of sustainable national development and given that scientific competitions that are no longer an indispensable luxury, but rather have become an objective equation for excellence and progress in scientific fields. For the reason that it is with the momentum the competition to ascend the podiums, everyone who wants to achieve this must take all the means that allow them not only to access those platforms but to reserve a permanent place on them.

There is no doubt that many countries rely on local competitions as one of the methods for developing and raising the rates of scientific creativity and innovative capabilities and discovering the scientific talents of their students to provide them with the necessary scientific care. That fact has been perceived by the world around us for a long time.

Hungary, for instance, held the first mathematics competition in 1894, i.e. 119 years ago. Whereas more than 79 local competitions are organized at all levels and regions in the United States. Perhaps everyone agrees here that the mobility that these competitions do on all the elements of the educational process goes beyond solely winning a competition, but rather deepens on the positive impact, which aims at raising the professional competencies of teachers and achieving the ambition of our distinguished sons and daughters to obtain ideas that are much deeper than the ones provided by a school curriculum.

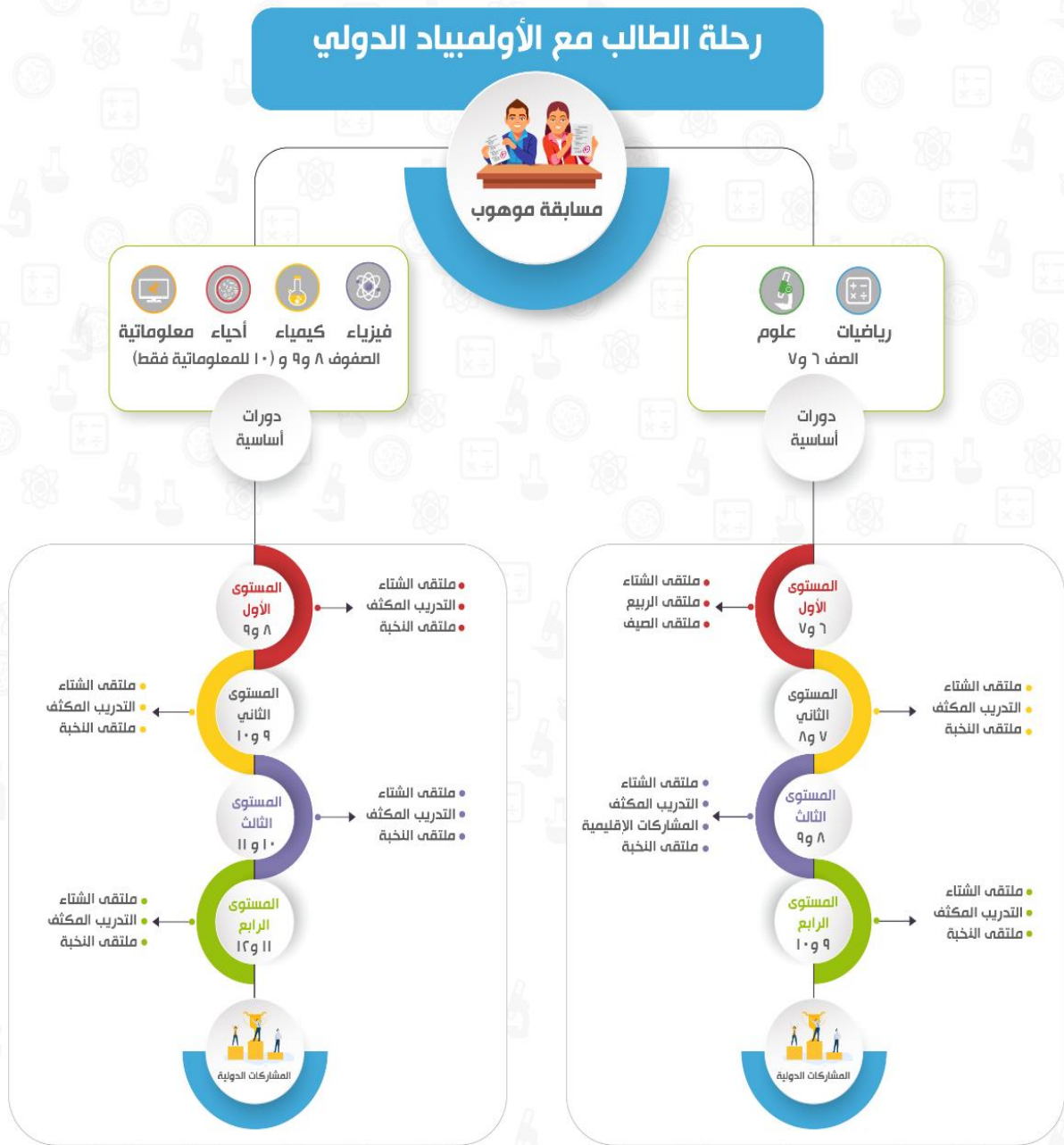
The methods of implementing these competitions vary according to the different goals and aspirations of the organizing countries. It is perhaps agreed upon by everyone here that the movement that these competitions make on all elements of the educational process goes beyond just winning a competition, but deepens the positive impact, which is aimed at raising the professional competencies of teachers and achieving the ambition of our distinguished sons and daughters. To get deeper ideas than what the school curriculum offers.

King Abdul Aziz and His Companions Foundation for Giftedness and Creativity "Mawhiba" have always been the forerunner to such challenges. From which it always aims to discover the nation's talents in scientific disciplines, and keen to find different sources to improve the quality of selection.

Along with the National Program for Gifted Students Identification, "Mawhoob" Mathematics Competition And science competition was established to delve deeply in search of these creative national competencies and capabilities to find them early. Allowing us to refine, nurture, and train them for a sufficient period to achieve the standards of participation in the International Olympiad programs.

What is a

It is a scientific competition in the field of mathematics, science and informatics, which is considered the main portal for entering the world of international scientific competitions.



for Mawhoob competition

King Abdulaziz & His Companions Foundation for Giftedness and Creativity
"Mawhiba", in cooperation with the Ministry of Education.

Target group

Saudi male and female students from 6th to the 10th grade.

Competition stages:

The competition will take place in two stages:

first: It is carried out remotely and the target is to participate in 15,000 students.

II: It is done in writing**** for students nominated from the first stage at the headquarters specified by the education departments to which the students are affiliated. (Exceptionally done this year remotely as well).

Competition

- 1- Pushing the educational field towards more efforts to develop mathematics and science education.
- 2- Discover the distinguished elements of our male and female students at an early stage to develop their capabilities.
- 3- Discovering distinguished teachers interested in the field of work on Olympic problems.
- 4- Spreading the culture of the Olympiad.
- 5- Raising the spirit of competition between the elements of the educational process.

Competition

The competition targets male and female students who have a passion for the scientific disciplines below, according to the following criteria:

1. The student must be a Saudi national.
2. The student must register in one scientific major only.
3. The student must register in the required specialization according to his grade, provided that the student is in one of the following grades at the beginning of the school year 1442H

Class	Subject					
	Mathematics.	Science	Physics	Chemistry	Biology	Informatics
6th Grade	✓	✓				
7th Grade	✓	✓				✓
8th Grade			✓	✓	✓	✓
9th Grade			✓	✓	✓	✓
10th Grade						✓

4. Complete the competition in its two phases.

Test Instructions

1. The only reference to the subjects of the competition is the mathematics and science syllabus from the Ministry of Education.
2. The student can access the system and take the pilot test directly after receiving the account activation message from the e-learning management system on the e-mail registered in the portal.
3. The test duration is 90 min only.
4. The calculator is allowed to be used in all stages of the competition except for mathematics majors.

(You can use the guide for the competition on our website to obtain samples of questions for each major)

The schedule for the 2020 talent competition

Program	Date		Length in Days	Scientific Disciplines
Register for gifted test	July 8, 2020	September 21, 2020	76	All Specialities
the first stage of Mawhoob test: "Performing an e-test"	September 28, 2020	September 28, 2020	1	Chemistry - Physics - Biology
	September 29, 2020	September 29, 2020	2	Mathematics - Informatics - Sciences
Announcing the results of the first phase	October 1, 2020	October 1, 2020		All Specialities
The second stage of the gifted test: "Performing an e-test"	October 4, 2020	October 4, 2020	2	Chemistry - Physics - Biology
	October 5, 2020	October 5, 2020		Mathematics - Informatics - Sciences
Announcement of phase II results	October 8, 2020	October 8, 2020	1	All Specialities

Exam entry

1. Availability of a computer operating system (Windows or IOS)
2. Connecting the computer device to the internet (making sure that no other device is connected to the network during the testing period to ensure the stability of the connection).
3. Only use **Google Chrome (Google Chrome)** and make sure that it is updated to the latest version **and not** to use any other browser to perform the test, including Microsoft Internet Explorer or Microsoft Edge or Safari.
4. Just keep the Google Chrome browser running and make sure that all other programs and windows are closed during the test.

Entry Instructions:

Enter on the link: <https://mawhiba.classera.com>

Then enter the login data as follows:

1. In the Username field: The email with which the student was registered in Mawhiba portal
2. In the password field: Password sent to you.
3. Click on the blue login button to enter the test

تسجيل الدخول

البريد الإلكتروني الذي تم تسجيل الطالب به في بوابة موهبة

اسم المستخدم

كلمة المرور المرسل لك.

كلمة المرور

الضغط هنا للدخول إلى الاختبار

تسجيل الدخول

تسجيل الدخول بحساب موهبة

If you encounter difficulty:

What to do if you encounter one of the following problems?

1. Machine restarting problem
2. Close the browser
3. Internet disconnection during the test

We hope that you will follow the steps below to get back for testing

1. Open the browser again and enter the test link <https://mawhiba.classera.com>
2. Then enter the login data
3. Press the start test button
4. Navigating between the test questions is by clicking on the Previous and Next button located in the top left of the screen, above the question in the Arabic interface, and in the upper right of the screen in the English interface.

Test Delivery

Upon completion of answering the test questions:

1. Click on the Submit button located at the bottom of the screen in the last question in the test.
2. When you click on it and confirm the delivery, the test will end and the result will appear to you, and you will not be able to enter it again.

Competition registration link:

<https://www.mawhiba.org/Ar/programs/competitions/mawhoob/Pages/Registration.aspx>

Note: The student who does not have an account in Mawhiba is directed to create an account through the link:

<https://login.mawhiba.org/Check/RegistrationPage.aspx>

And then register for the competition.

Important

1. Mawhiba website has introductory guides for each of the six contest tracks, and each guide contains several experimental questions that explain to the student the type of questions.

<https://www.mawhiba.org/Ar/programs/competitions/mawhoob/Pages/library.aspx>

2. 1- Ensure that you are connected to the internet before the test date.
3. Verify the test login data (username: the remote mail with which the student is registered in Mawhiba portal and the password that will be sent to you later)
4. 3- Entering the test site 15 min before the test time.
5. Avoid closing the browser during the test.
6. 5- Pay attention to the remaining time for the test.
7. 6- There is only one submission attempt for the test.
8. 7- Avoid clicking the Submit button unless you are sure that all questions have been answered and the test has been completed.

Mathematical skills

Preparation for participation in international informatics competitions depends on the competitor's mental capabilities and a good background in solving mathematical problems



Exercise 1

Ahmad and Muhammad calculated a result: $8 - (5 + 2)$ Ahmad got the correct result, while Muhammad did not pay attention to the parentheses and calculated the result of $8 - 2 + 5$. If Ahmad's answer is "C" and Muhammad's answer is "L", then what is the value of $C - L$?

- A -10
- B -6
- C 0
- D 6
- E 10

Exercise 2

Hamad owes Hamda an amount of 35 halalas, and he has a *treasure box* filled with coins of 5 halalas, 10 halalas, and 25 halalas. What is the difference between the largest number of currencies and the smallest number of currencies that he can use to pay off his debt?

- A 1
- B 2
- C 3
- D 4
- E 5

Exercise 3

The school asked her to read a book for a week, so she read 36 pages a day for the first three days, and she read 44 pages per day for the next three days, then she finished reading the book by reading 10 pages on the last day. How many pages are in the book?

- A 240
- B 250
- C 260
- D 270
- E 280

Exercise 4

If the sum of two prime numbers is 85, what is the product of the first two numbers?

- A 85
- B 91
- C 115
- D 133
- E 166

Exercise 5

A car cuts a 32 mph quota using 1 gallon of gasoline, which costs 4 Riyals, so how many miles can a car share if it refills 20 riyals of gasoline?

- A 64
- B 128
- C 160
- D 320
- E 640

Exercise 6

You have six rectangles, each of which is 2 cm wide, while their lengths are 1, 4, 9, 16, 25, 36, respectively. What is the sum of the total areas of the six rectangles?

- A 91
- B 93
- C 162
- D 182
- E 202

Exercise 7

The number of girls in the Sultan's Gifted class is 4 times more than the number of boys, so if the number of students in the class is 28, what is the ratio of girls to boys in the class?

- A 3 to 4
- B 4 to 3
- C 3 to 2
- D 7 to 4
- E 2 to 1

Exercise 8

11 Member in club medium for the mathematics, all their blessing enforce payment breath informed for the teacher ironing knows them the questions in meeting prevent the club. The total amount they paid is 2 d 1 riyals (the tens place is D). What is the value of d?

- A 0
- B 1
- C 2
- D 3
- E 4

Exercise 9

The first gifted exam was in the year 1435 and is still given every year since that time. Hessah was 12 years old when the Mawhoob exam was conducted in its seventh year, in which year was Hessah was born?

- A 1429
- B 1430
- C 1431
- D 1432
- E 1433

Exercise 10

Mawhiba magazine published photos of 3 celebrities and their three babies' pictures without reference to Whom's father, if you are asked to refer each parent to his baby and tie them randomly, what is the probability that your link is correct?

- A $\frac{1}{9}$
- B $\frac{1}{6}$
- C $\frac{1}{4}$
- D $\frac{1}{3}$
- E $\frac{1}{2}$

Exercise 11

There are 8 football clubs in Jeddah, in the Saudi League. Each of the 8 clubs plays with the rest of the clubs twice, and plays 4 times with clubs from outside Jeddah. What is the total number of different matches that a Jeddah club will play?

- A 60
- B 88
- C 96
- D 144
- E

Exercise 12

4 children were born in Yanbu Central Hospital, assume that there is the same possibility that the child is a male or female, i.e. the following is more likely:

- A 4 males
- B 4 females
- C 2 males and 2 females
- D 3 is of the same type and 1 is of the other type
- E All of them are the same possibility

Exercise 13

A $3 \times 3 \times 3$ cube made up of 27 cubes $1 \times 1 \times 1$, 21 small cubes are red and 6 white. If the cube is made so that the color of its outer faces contains the least amount of white, then any of the following fractions represents the amount of white on the faces of the cube.

A $\frac{5}{54}$

B $\frac{1}{9}$

C $\frac{5}{27}$

D $\frac{2}{9}$

E $\frac{1}{3}$

Exercise 14

Three members of the soccer team at Mawhiba Schools had the following conversation:

Ahmad: Notice that our numbers are all two-digit prime numbers.

Mohamed: And the sum of your numbers is my birthday, which happened this month.

Khaled: This is getting funny. The sum of your numbers is the same as my birthday, which will happen later this month.

Ahmad: And the sum of your numbers is the date today.

What is Khaled's number?

A 11

B 13

C 17

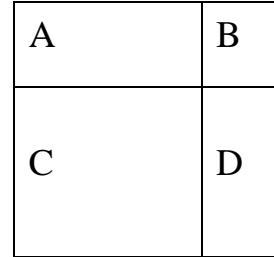
D 19

E 23

Exercise 15

The next square is divided into four sections, section B is a square with a circumference of 20, and section C is a square with a circumference of 80. Find the area of the large square.

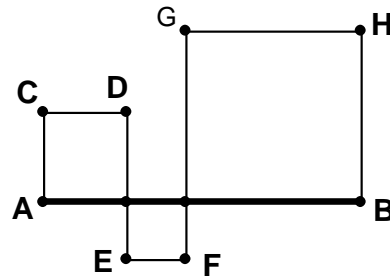
- A 600
- B 625
- C 64
- D 550
- E 500



Exercise 16

Suppose we have three squares in the image below. Find the length of $ACDEFGHB$ given that AB is equal to 10.

- A 140
- B 25
- C 30
- D 19
- E 23



Computational Thinking

The Informatics Olympiad relies on mental skills such as problem-solving and computational thinking skills as logical and algorithmic thinking, analysis and abstraction

Computer thinking requires the use of a set of problem-solving skills that programmers use to write programs and applications



The Concept of Computational Thinking

It is a set of problem-solving techniques that include expressing problems and their solutions in ways that a computer can implement. It includes the technical skills and practices needed to design the calculations that make computers do jobs for us. It is also known as a higher way of thinking in dealing with the problems that face us in life, based on steps that a human being or a machine can follow to understand the problem, analyze it, and formulate the solution in a way that humans and computers can understand and apply (Shuchi Grover, 2018).

The American CSTA in collaboration with the International Society for Technology in Education (ISTE) defined it as a problem-solving process.

Computer thinking

Computer thinking includes a number of key skills, namely:

Abstraction

Focusing on the important information in the problem by creating something simple from something more complex by isolating or excluding details that are not relevant.

Algorithmic thinking

A method for reaching problem solving by writing steps for specific, clear, and ordered instructions step by step

Pattern Recognition

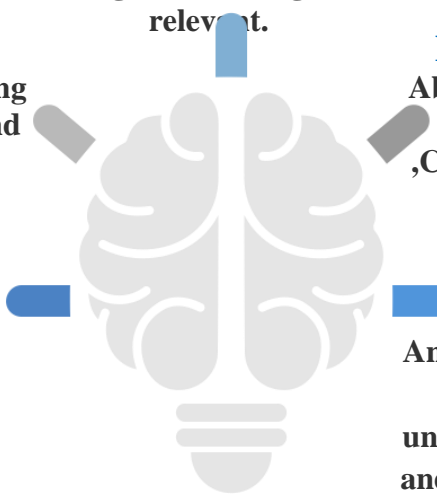
Ability to identify patterns and similarities.
,Common Characteristics, and Difference

Generalization

Take advantage of the processes used previously to solve a specific problem and apply them to a variety of new problems, which supports the rapid solution of new problems

Decomposition

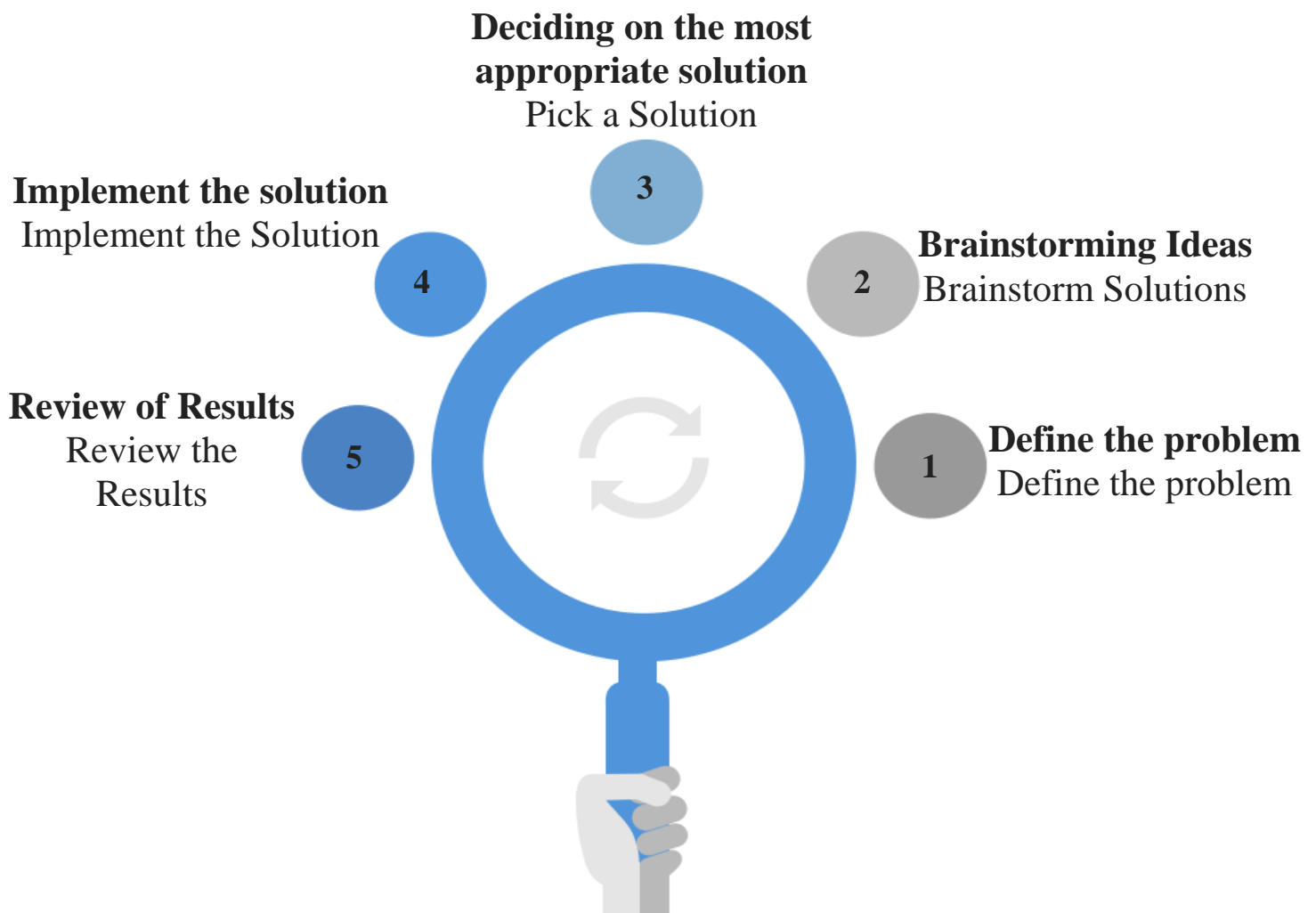
Analyzing the component parts of problems, which helps to understand the parts they contain and solve them through dividing a large and complex problem into small parts that are easy to understand.



The concept of problem

Researchers Krolik and Roddick define "problem-solving" as a thinking process in which the individual uses his previously acquired knowledge and skills to respond to the requirements of a situation he is not familiar with, and the response is by undertaking an action aimed at solving the ambiguity or confusion contained in the situation .

Problem Solving Steps



When solving computational problems
algorithm steps are followed to reach the correct solution
Each step of the algorithm is then represented by geometric
drawings

It's called **flowcharts**

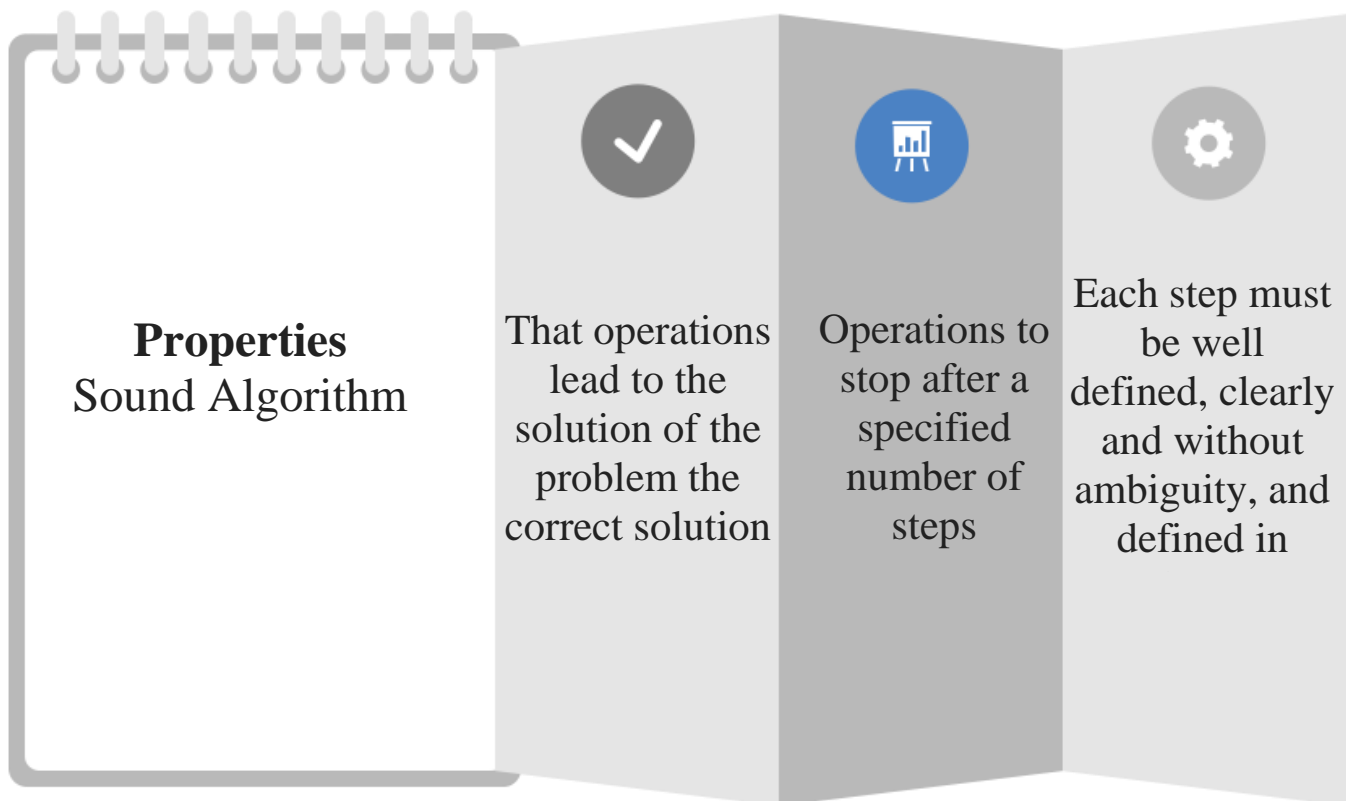
Visually illustrates the course of the optimum solution



Steps Algorithm

A set of well-defined steps and processes that are performed in a specific order to solve the problem in a specified number of steps.

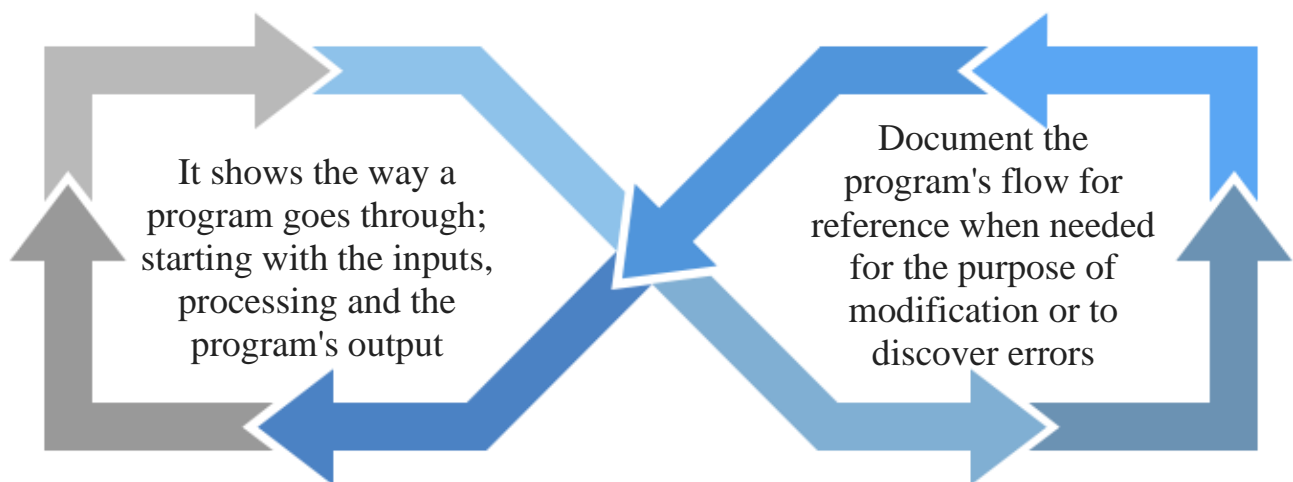
Algorithmic steps are derived from the name of the Muslim mathematician Abu Jaafar Muhammad ibn Musa al-Khwarizmi, who died in the year 825 CE. He was the first to use the structured algorithmic method for solving algebraic equations according to sequential steps.



Flowchart

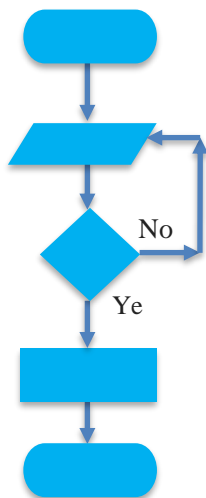
It is called flowcharts, and it is a diagram that is designed using a group of geometric shapes connected to each other by arrows that show the arrangement and sequence of algorithmic steps to solve the problem.

Benefits of Flowcharts:

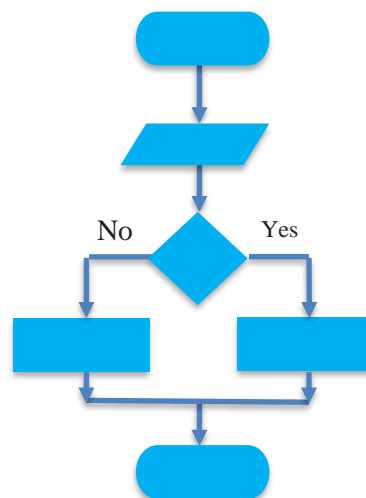


Types of Flowcharts:

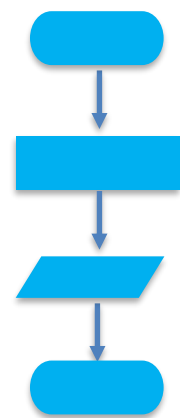
Loop maps










Branching flow maps
(Decision-making)



Simple Flowcharts



Some geometric shapes used in building flowcharts:

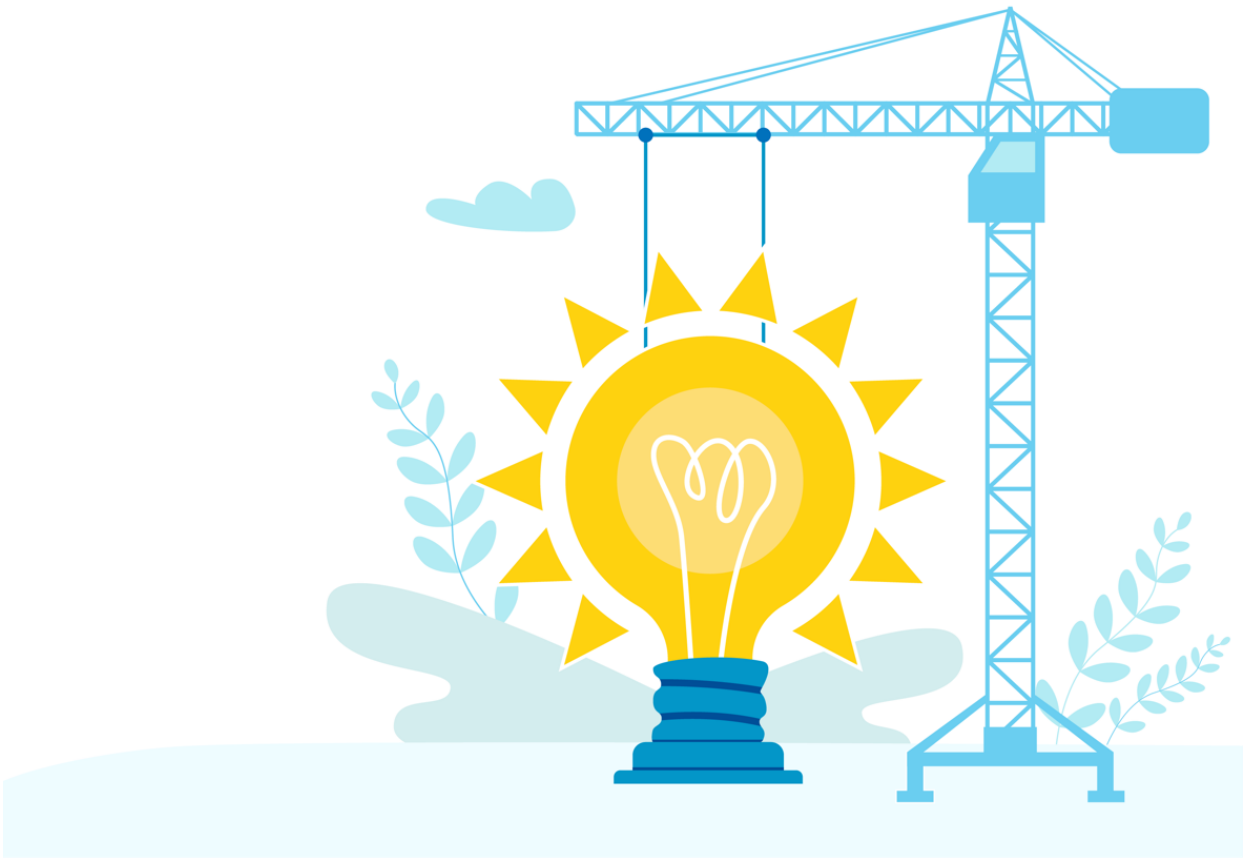
Shape	Name	Function
	Oval	It symbolizes the beginning of the end of the program
	Parallelogram	Data entry / or information output
	Rectangular	Perform mathematical operations
	Rhombus	Boolean Operations are comparison operations
	Irregular polygon	The output is on the printer
	Arrows	The direction of the program
	Circle	To connect geometric shapes together

Drawing Flowcharts Instructions

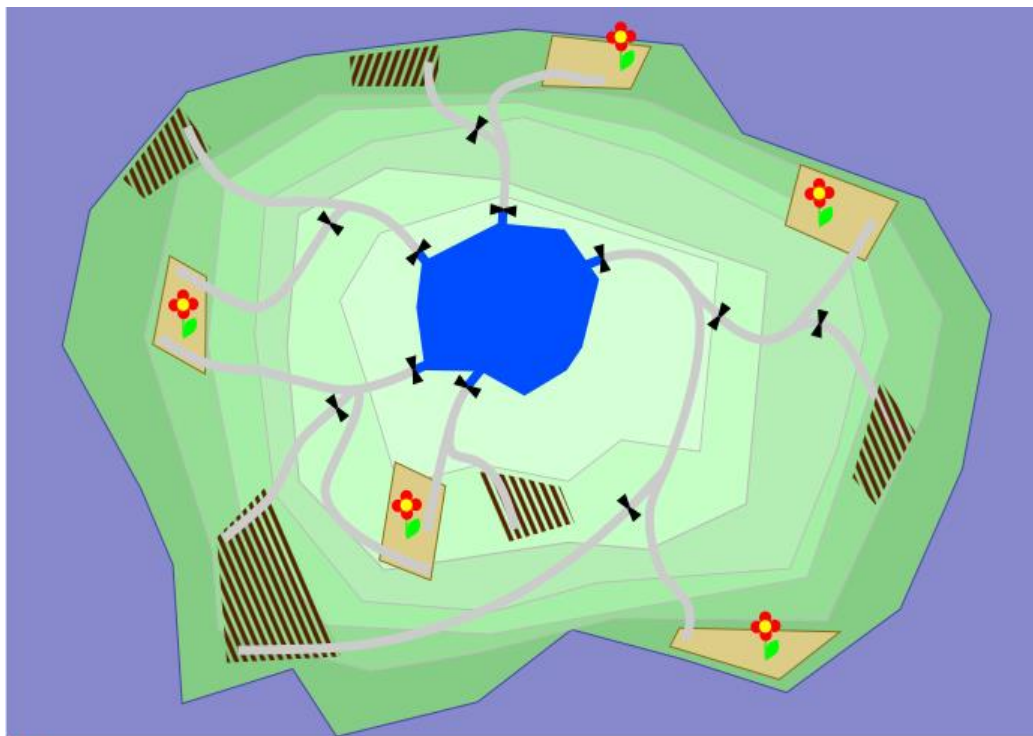
- ✓ The flowchart should start with the start symbol and end with the end symbol.
- ✓ The input values (inputs) are expressed using words such as: Enter or read (enter, read, input, get).
- ✓ The output is expressed using one of the words: Output, print.
- ✓ Decision-making symbol (Rhombus symbol) for which only one share enters and at least two arrows exit from it.

Skills exercises

Computational Thinking



Exercise 1



Needs water

Must remain dry



Ahmad's family needs to water their fields that grows only flowers. To do so, it is possible to control opening and closing the black water gates by clicking on them by one click, and if they are open, the water will flow through the channel to the fields (from the lake at the top of the mountain to the bottom).

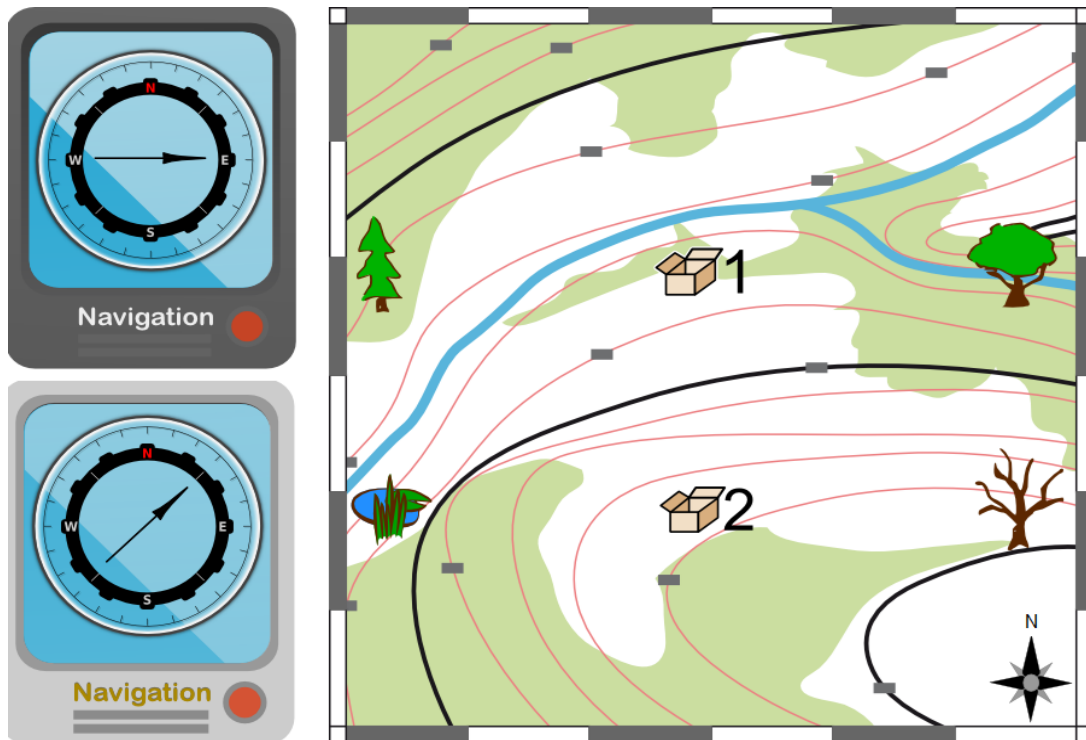
Question

Help Ahmad's family by identifying the correct gates to open them to water only the blooming fields?

- A 3 portals must be opened to complete the mission
- B 4 portals must be opened to complete the mission
- C 5 portals must be opened to complete the mission
- D 6 portals must be opened to complete the mission

Exercise 2

The two friends Fahad and Ayman are searching for small treasure boxes hidden somewhere in the landscape of nature in the picture below. These two friends have applications in their smartphones that show them the direction to the treasure that has been chosen. There are two types of treasures in the picture. Fahad seeks to search for the treasure with number 1, while Ayman seeks to search for the treasure with number 2. Both friends are standing in the same place. In the picture, you can see their device to the left of the treasures map drawing, and we do not know which of the two devices belong to Fahad and which one belongs to Ayman.



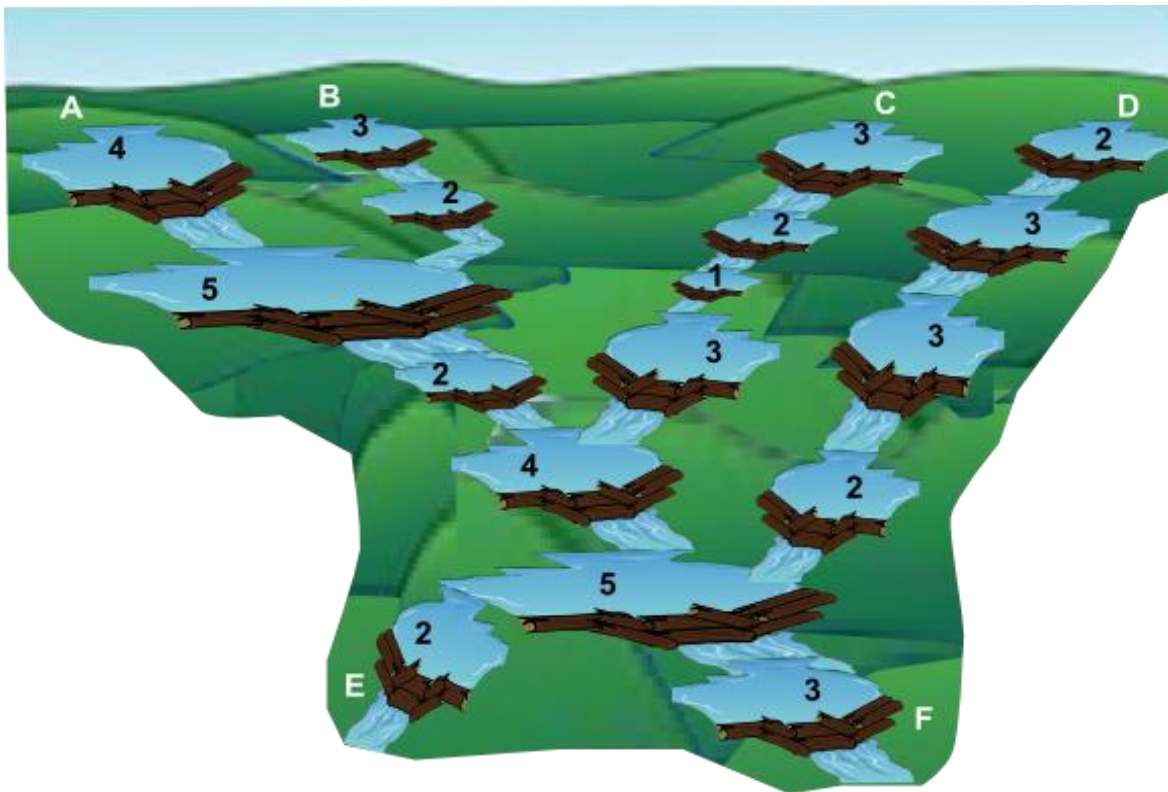
Question

Where do Fahad and Ayman stand in the picture?

- A  B  C  D 

Exercise 3

In a single place in the beavers town, beavers made many dams to hold water as shown in the figure below. So, several basins were formed, some are larger than others, in each pond there is a pipe to the next pond, the numbers shown on the picture indicate the maximum flow rate Water (liters per second) goes down through the tube from one pool to another.



Question

Which route achieves the highest flow rate through the pipes?

A

A-E

B

C-E

C

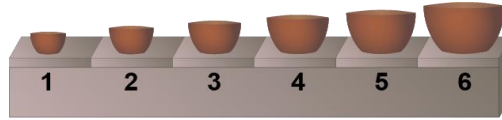
B-F

D

D-F

Exercise 4

A factory produces groups of 6 plates of different sizes. The long conveyor belt moves the dishes one after the other from left to right. The six dishes that were produced from each group are placed on the belt, assembled together, but in random order, so before packing, the dishes must be sorted as it follows:



To help with sorting, the factory places workers along the conveyor belt. When a group of dishes passes by a worker, he will exchange any of the adjacent plates in the wrong order "See how the order of the group of dishes changes as it passes in front of one worker":



Question

In the following picture, how many workers must the plates pass in front of in order to obtain a screening?

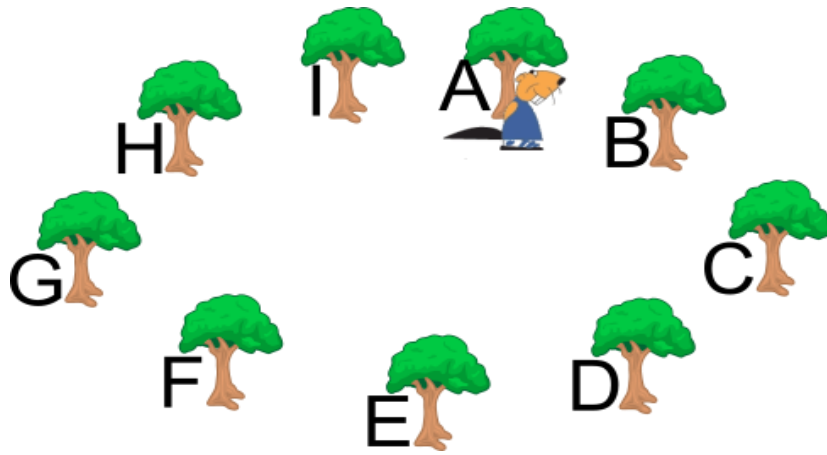


- A 4 workers
 B 3 workers
 C 5 workers
 D 6 workers

Exercise 5

The beaver wants to cut a circle consisting of 9 trees, as he is initially standing next to tree A.

In the first turn, the beaver goes forward clockwise to the first tree (which is Tree B), and when it reaches there, it cuts that tree. In the second turn, it steps counterclockwise to the second remaining tree (not cut) and when it arrives there He cuts that tree.



The beaver continues to cut trees in the same way, alternating between moving clockwise and counterclockwise with one additional step taken per turn, in addition to skipping all the trees that have been felled.

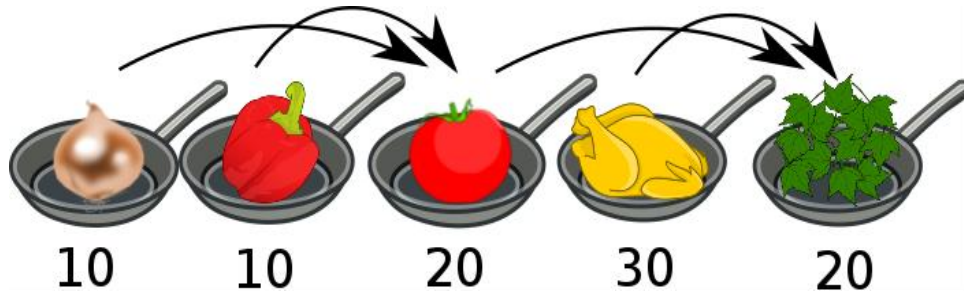
Question

What trees will remain standing that have not been cut after 7 rounds?

- A A and C
- B E and I
- C E and H
- D A and H

Exercise 6

Sarah loves to cook, and when she cooks in the garden, she uses the stove and takes the following actions step by step:



10 min	Cooking onions	1
10 min	Sweet pepper	2
20 min	Combine the cooked onion with the cooked bell pepper, add the tomatoes and cook together	3
30 min	Cooked chicken	4
20 min	Gather everything from steps 3 and 4, add some spices, and cook it all.	5

You need a total of 90 minutes to prepare the chicken meal. When Sarah cooks at home, she has several stoves and can use it to prepare a ready meal as soon as possible.

Question

Which of the following statements is incorrect?

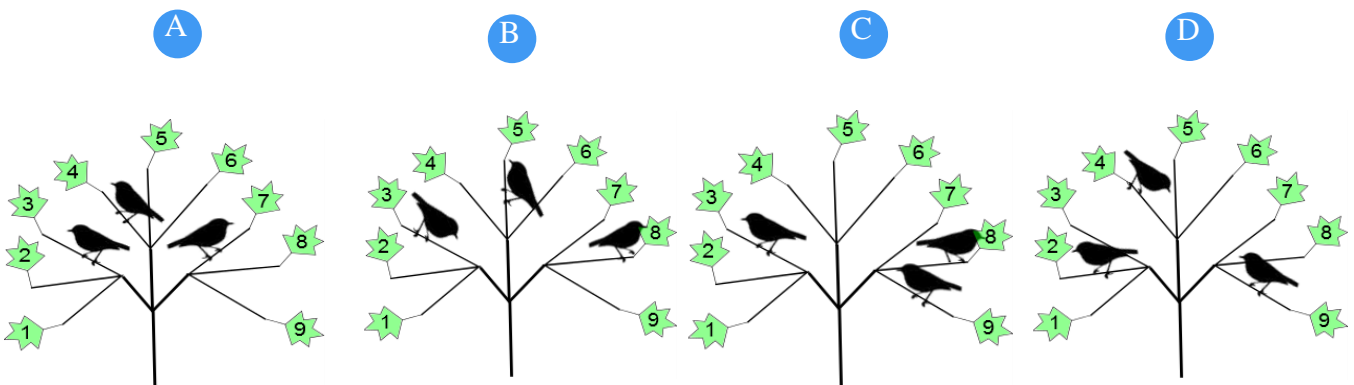
- A Sarah can reduce the cooking time to 10 minutes when using 2 stoves.
- B Sarah can reduce the cooking time to 30 minutes when using 2 stoves.
- C Sarah can reduce the cooking time to 40 minutes when using 3 stoves.
- D Sarah can reduce the cooking time to 50 minutes when using 4 stoves.

Exercise 7

Three small birds stand on the branches of the tree, every three seconds two of them move to the other neighboring branches on which they were standing, but not directly from Branch 9 to Branch 1, nor from Branch 1 to Branch 9.

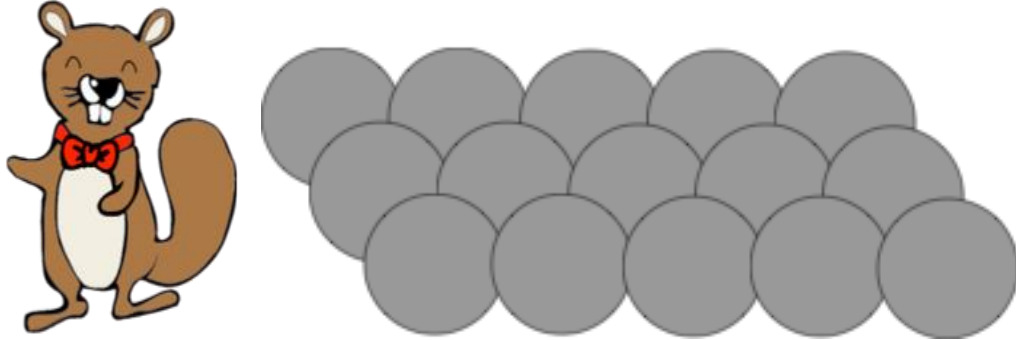
Question

After some time, all birds can congregate in branch 1 of a tree. Which tree is it?



Exercise 8

In a game you play with a beaver, there are some stones that players take turns to pick up, in each turn the player can pick up 1, 2 or 3 stones. The player who captures the last stone wins.



The game was originally played with 9 stones, and previous playing experiences show that the first player can always win the game by starting to take one stone, regardless of what the opponent does next. Now you and the beaver will play with 15 stones.

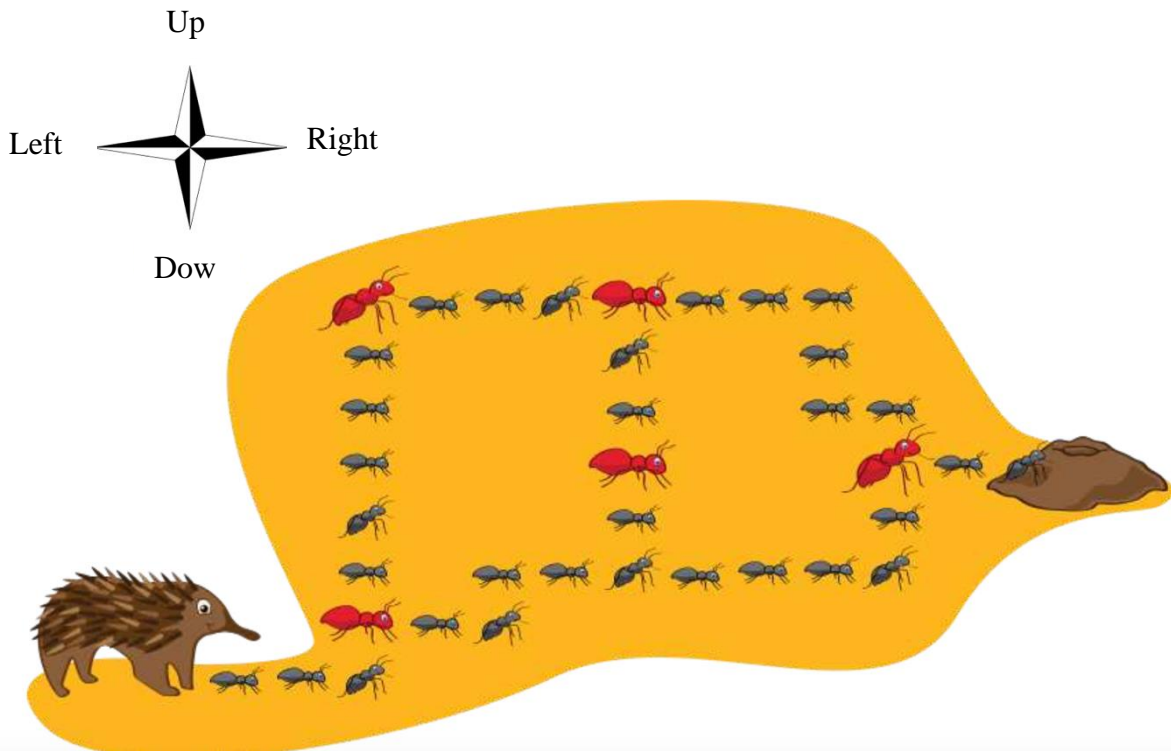
Question

You now began the game, how many stones must you pick up to ensure your victory in the game?

- A 1
- B 2
- C 3
- D There is no strategy that guarantees winning the game.

Exercise 9

A Giant anteater wants to reach the anthill, and to get there he must collect all the red ants (the largest ants), you can help him by watching him walk upright and asking him to walk (right, left, up and down as shown below) on the map.







Question

Which command should you give to Giant anteaters?



- A Right, Up, Right, Down, Right, Up, Right.
- B Right, Up, Right, Up, Right, Up, Right, Down, Right, Down, Right.
- C Right, Up, Right, Up, Left, Down, Right.
- D Right, Up, Right, Down, Right, Down, Right.

Exercise 10

Maha loves to go camping with her family. She takes a different set of tools for camping, and the choice of tools depends on the places she plans to go.



National park			Mountains	
Sea			River	

Maha stores camping gears after every trip in the warehouse; newly used camping gears are placed to the left of the unused items. Below are photos of the warehouse before and after the trip to the park.

Before the camping trip	After the camping trip
	

Question

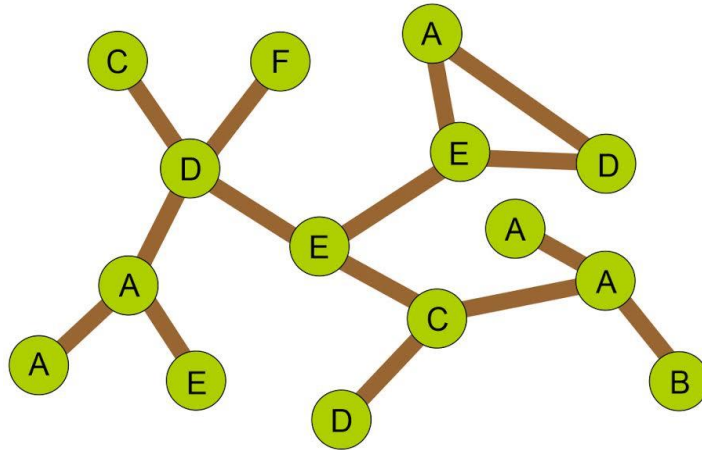
Maha's family went to two trips to the camp recently. Here are pictures of Maha's warehouse before and after the two trips. Where did the Maha family go to camp?

Before two camping trips	After two camping trips
	

- A Theme park, sea.
- B Park, river.
- C Sea, mountain.
- D Park, mountain.

Exercise 11

The following image is a map of a garden. The green circles with letters represent trees, and the brown lines are paths. Note that some letters are used to name more than one tree. The walk from tree F to tree B will be described as FDECAB



Last Sunday, two families walked in the park. The Soad family's trip (from left to right) was $B A A A C E D E E D A$ while the Ibrahim family journey (from left to right) $\{ \{ F D C D A E A D E D A$, bearing in mind that it is possible to go and return in the same lane.

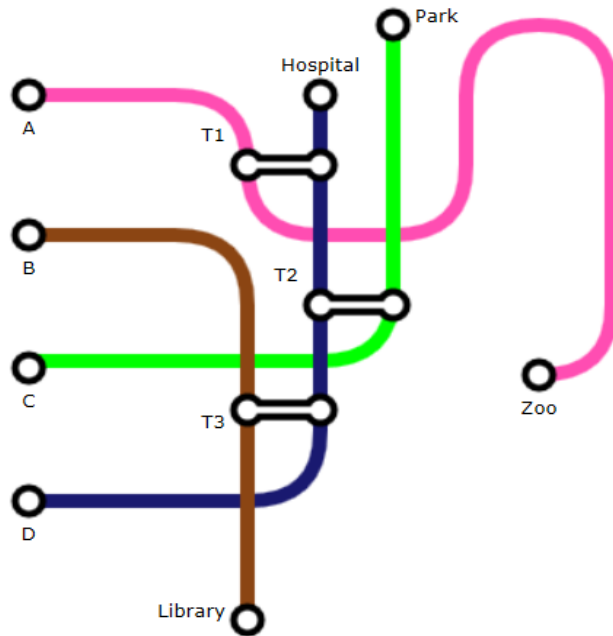
Question

Suppose that both families start walking at the same time and walking from tree to tree takes the same time. How many trees did the two families meet together in front of?

- A One time.
- B Twice.
- C Three times.
- D They never met during their last Sunday walk.

Exercise 12

The following figure shows the road network for the subway train in the Sultan's village. Four subway lines are starting from the stations A, B, C and D. There are also three other transit stations T1, T2 and T3 for changing from one line to another on the subway.



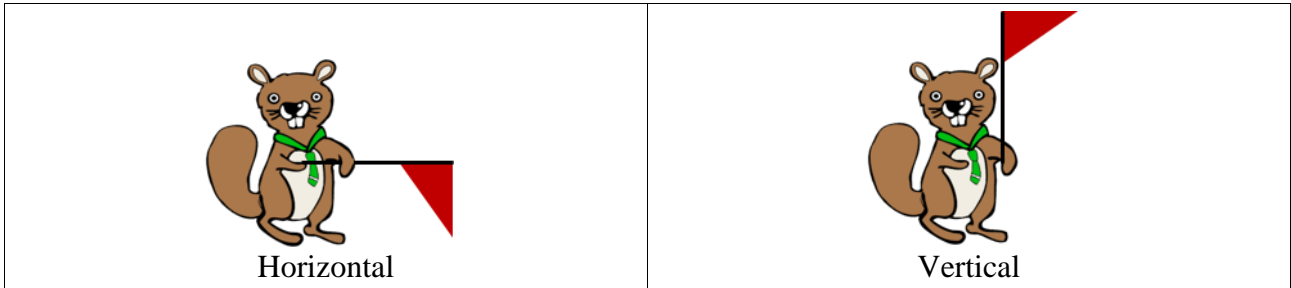
Question

Sultan went to the Zoo and only changed lines once. At which station did Sultan start his tour?

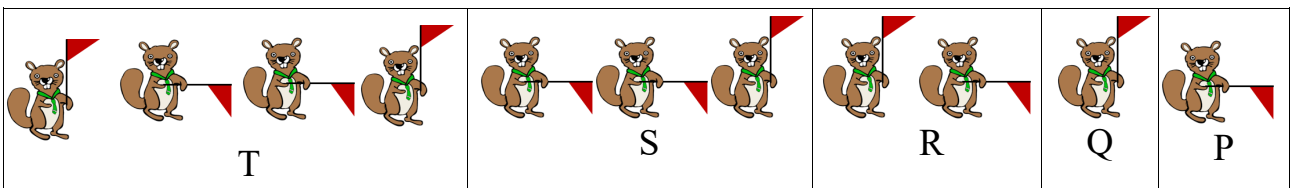
- A
- B
- C
- D

Exercise 13

Beavers communicate in the village by carrying flags, they either carry flags horizontally or vertically.

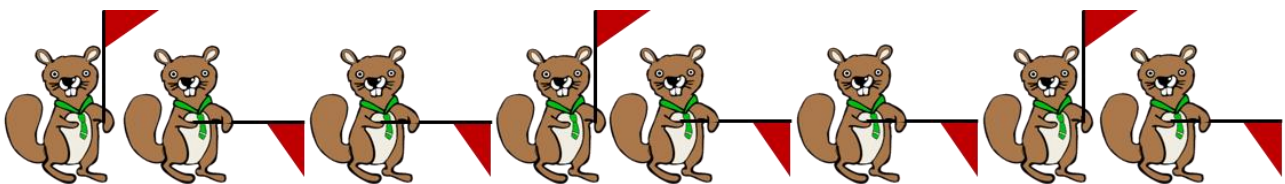


Beavers send their friends five different characters P,Q,R,S,T so that they send each letter by showing the flag in different places one after the other in the following way:



Question

The Beaver displays the following set of flag positions from left to right:



Which of the following messages was sent?

- A TSQ
- B RPQSR
- C RPSP
- D QPPTP

Exercise 14

Salem sells electronic devices and encodes the main features of his devices using 0 and 1. Code 0 means that the device does not contain the feature, while the number 1 means that it contains the feature. Below is a table of four devices and their features:

	Is the device recyclable?	Does it include Wi-Fi?	Does it include a screen?	Does it include a remote control?
A	0	1	1	0
B	0	1	1	1
C	1	1	0	1
D	1	1	0	0

Question

You are interested in purchasing a device that is:

- either includes a screen.
- Or it can be connected to a WiFi network and have a remote control.

Which of the devices from A to D would you definitely not buying?

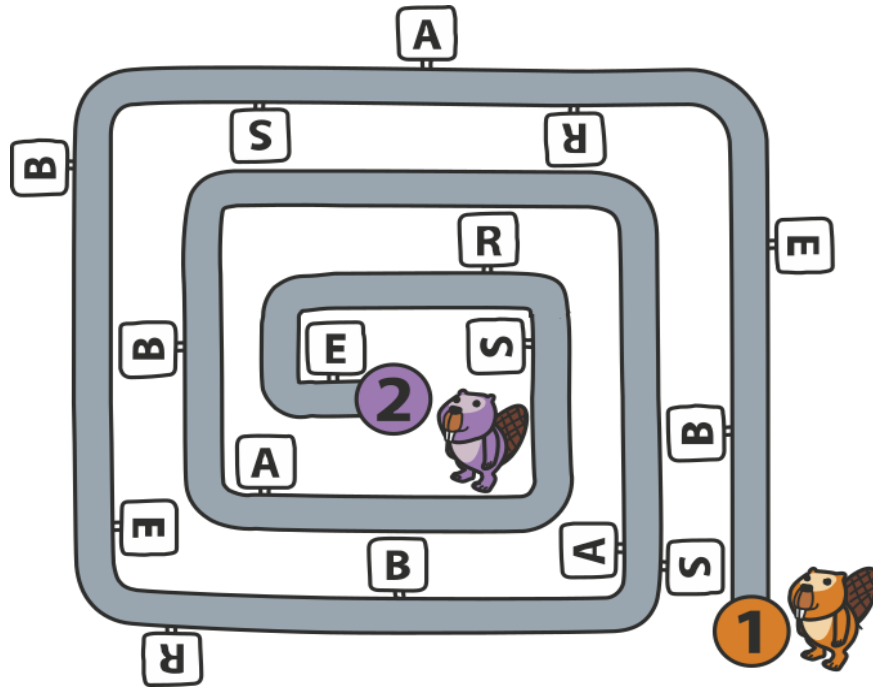
- A
- B
- C
- D

Exercise 15

The beaver Moufid and his colleague Adeeb want to walk across the road in the picture. Mofeed wants to travel from point 1 to point 2, and Adeeb wants to travel from point 2 to point 1.

Along the path there are letters ('B', 'E', 'R', 'A', 'S')

Mofid and Adeeb must collect letters. Mofid and Adeeb can only read letters to their left. When Mofid and Adeeb reach the end, they will collect the obtained letter string.



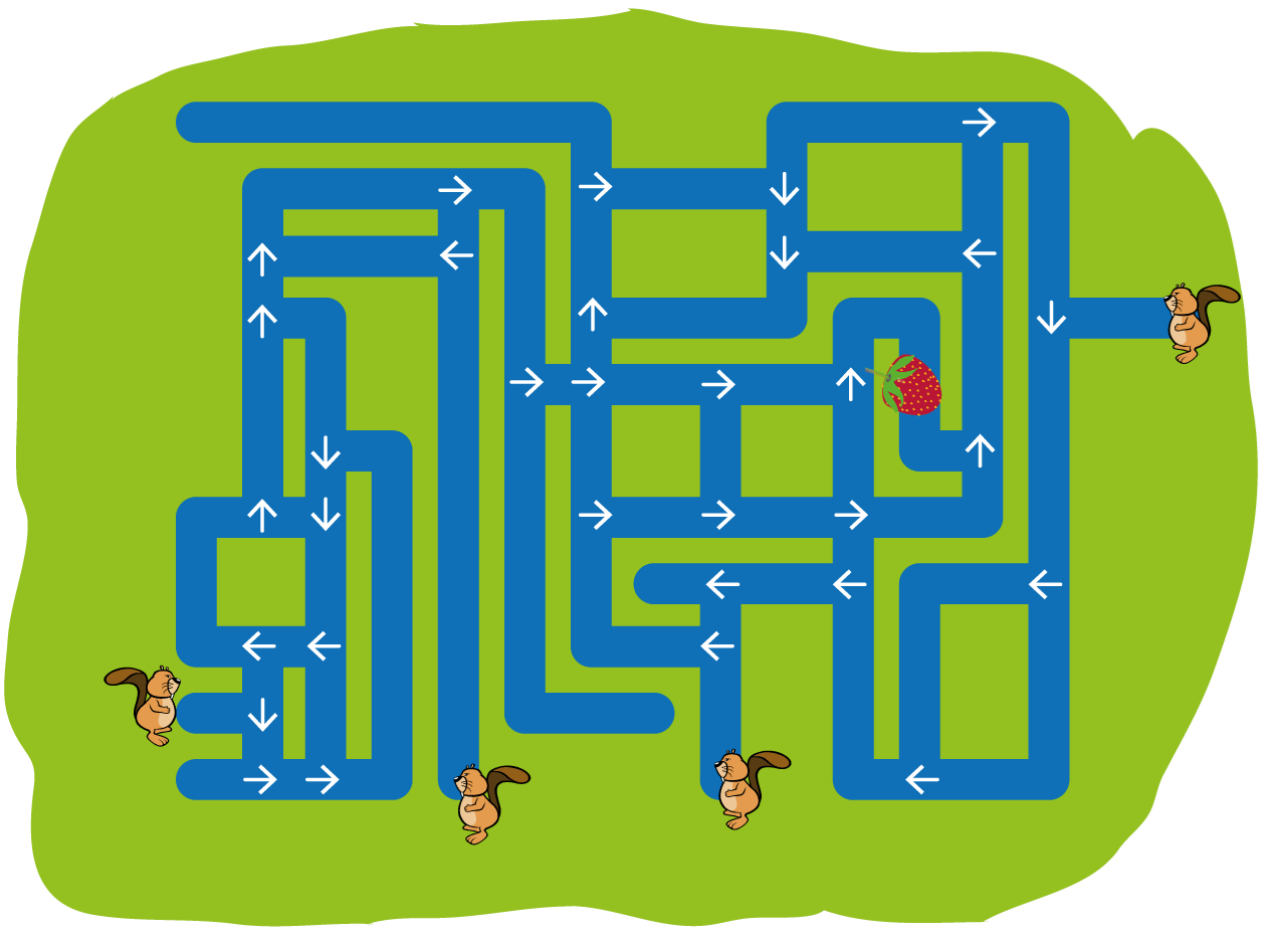
Question

What is the sequence of letters (from left to right) that the beaver Moufid and his colleague Adeeb will be upon reaching the end of the road?

- A Moufid BRSEBAASE Adeeb RBSRBAE
- B Moufid BRSEBAASE Adeeb RBBSRBAE
- C Moufid BRSEBAASE Adeeb RBSRBAE
- D Moufid BRSEBAAS Adeeb RBSRBE

Exercise 16

Four Beavers start swimming in different places. They always Swim forward and follow arrows.



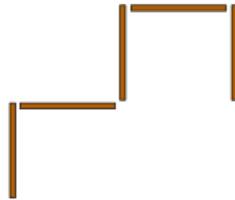
Question

How many beavers will reach strawberries?

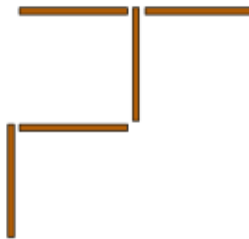
- A Two beavers
- B Three beavers
- C Four beavers
- D One beaver

Exercise 17

Walid has five sticks, and he put them on the table forming this shape:



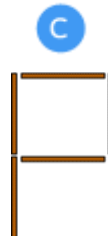
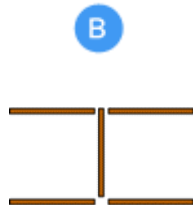
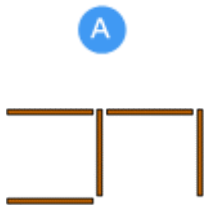
Hoda approached the table, took one stick and placed it in a different place, forming this shape:



Then Ahmed approached the table, took one stick and put it in a different place.

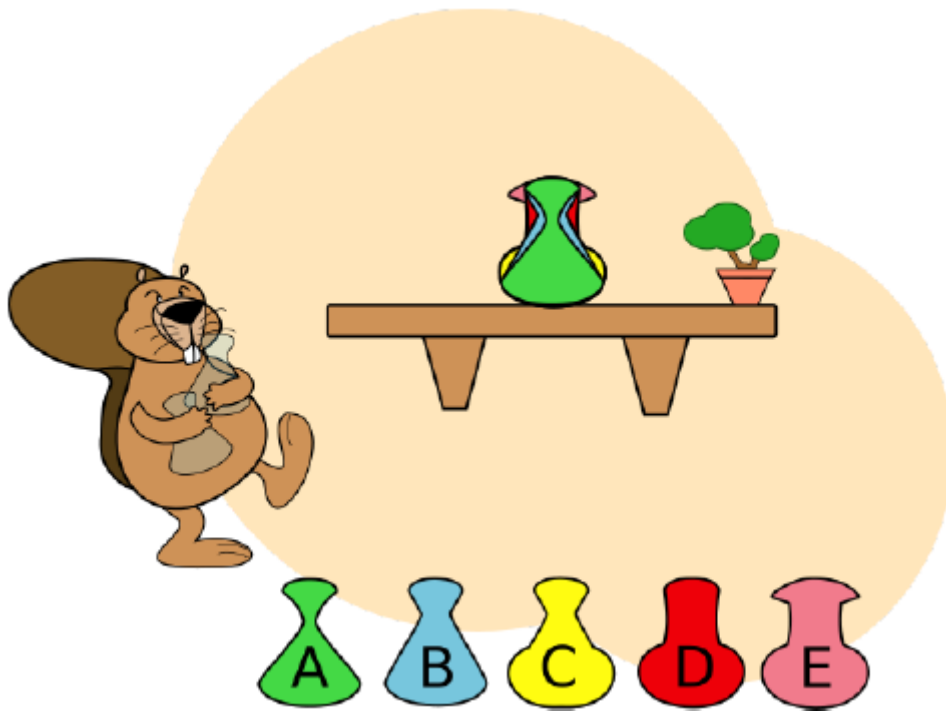
Question

What shape that Ahmed couldn't make?



The beaver, in front of you, places five bottles on the table, so that part of each bottle appears slightly.

It places the first bottle at the back of the table and places each new bottle in front of the bottles that were previously placed.



Question

What is the correct arrangement of the letters of the bottles (from left to right) according to their appearance in the previous figure (starting from the shape in the back, up to the shape in the front)?

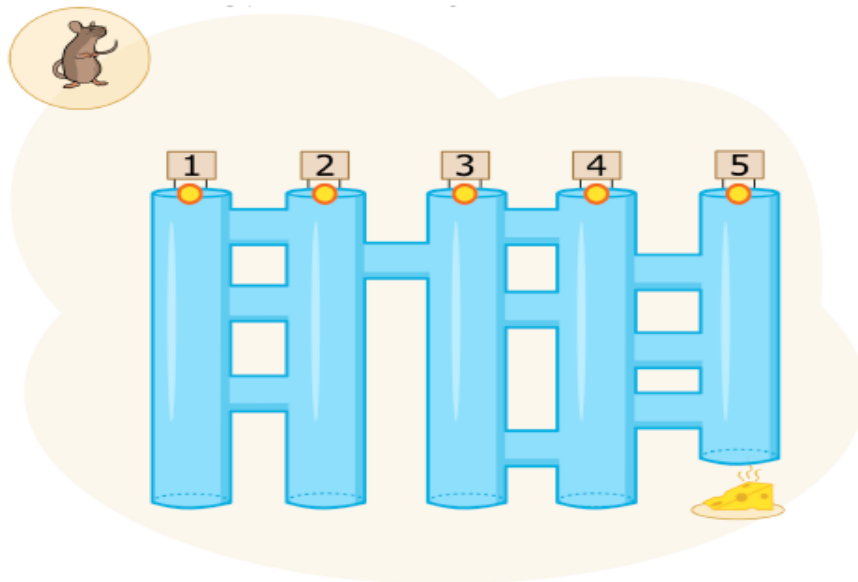
- A E D C B A
- B D B C A E
- C E C D A B
- D D C E B A

Exercise 19

A mouse stands at the entrance to a set of tubes. He wants to get to the cheese at the end of the fifth tube.

The mouse must follow these instructions to get to the cheese:

1. Go down to the intersection.
2. At the intersection, the mouse will get through the crossing hole to the next tube on the right.
3. repeats the same steps (1,2) only one more time.



Question

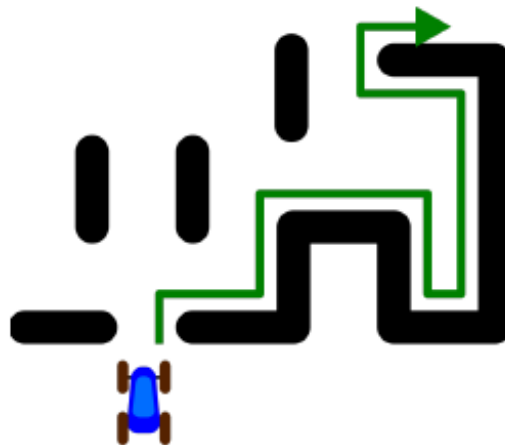
In which tube should the mouse start until it reaches the cheese following the previous instructions in a row?

- A Tube one
- B Tube Two
- C Tube Three
- D Tube Four
- E Tube Five

Exercise 20

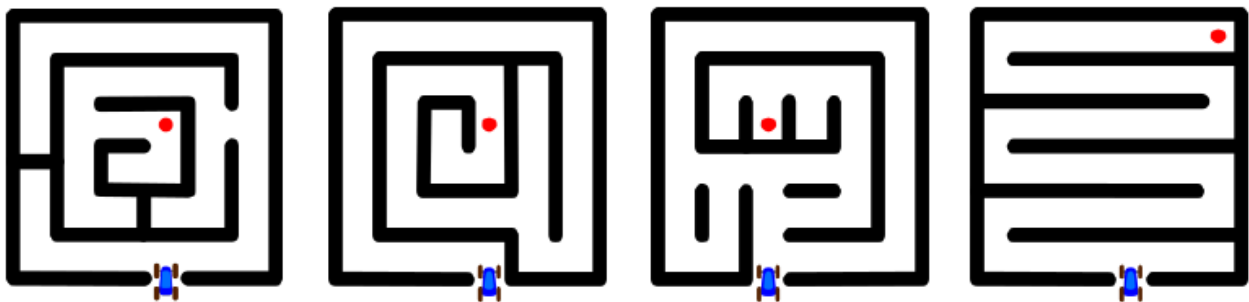
Robot cars using a simple rule to help them navigate the maze: (crossing over on the right side of the black line in the maze)

The following image shows an example of how the robot is walking through a maze.



Question

Using this method, how many following mazes will the car reach the red spot?

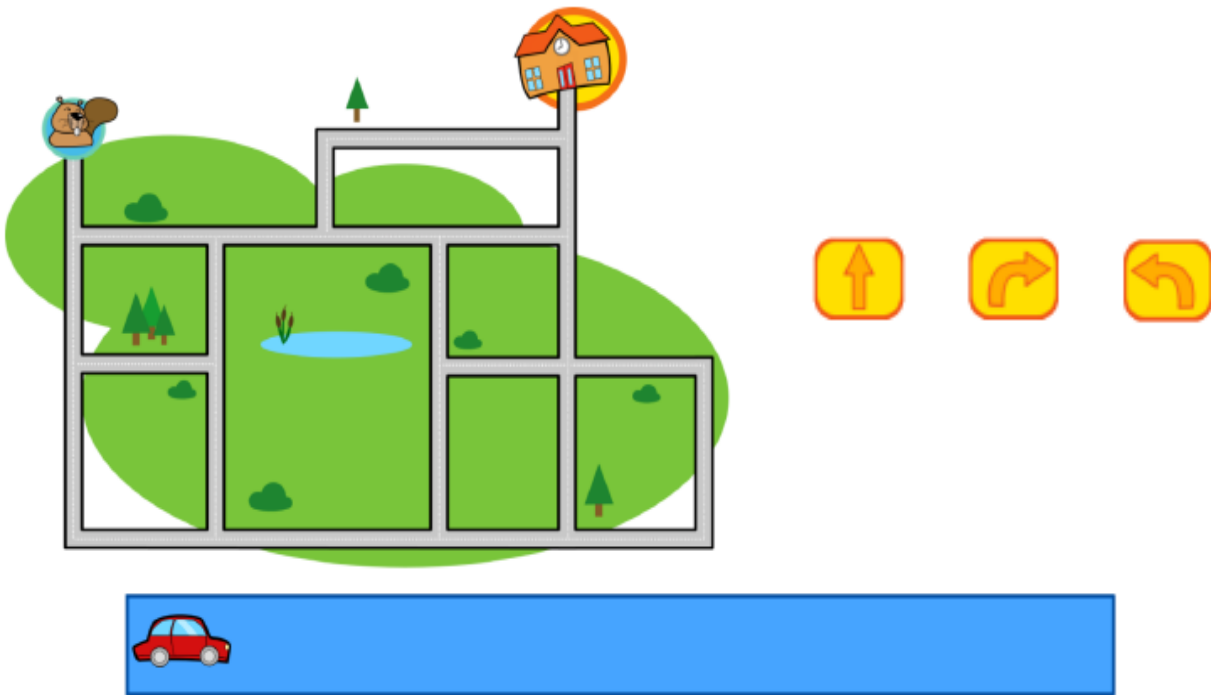


- A 0
- B 1
- C 2
- D 3
- E 4

Exercise 21

You need a self-driving car to take a student to school. The car is programmed to follow certain instructions only, namely:

- Turn Left: - a 90-degree turn to the left
- Turning right    the right
- forward: Move forward until the car cannot advance.



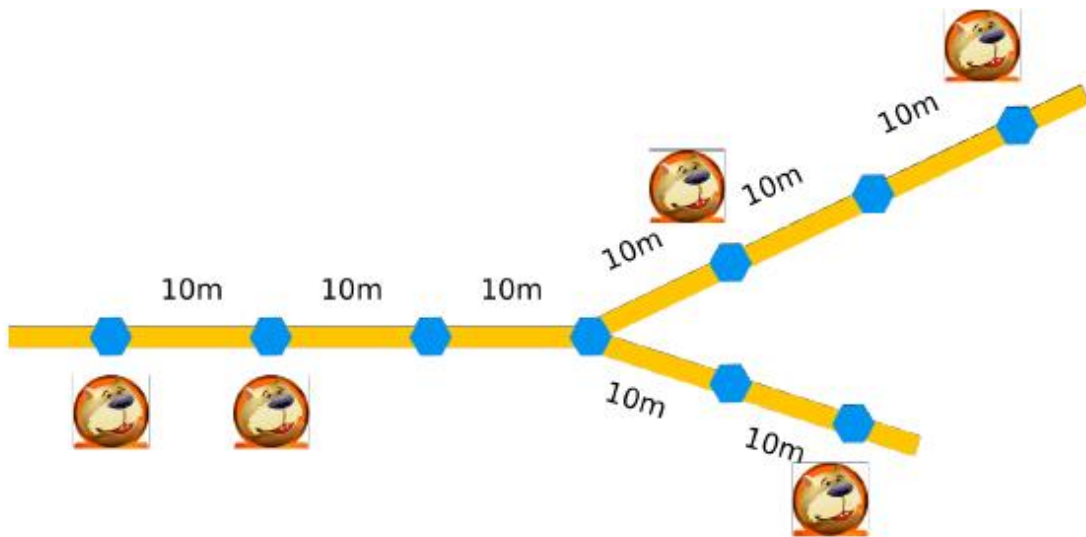
Question

Write a set of instructions (program) that makes the red car go to take the beaver to school by using the three yellow instructions in front of you.

Exercise 22

On the map in front of you is the huts of a group of beavers. Beavers want to locate a bus station at one of the blue hexagonal points, since all of these points are 10 meters apart.

The beavers decided that the total distance between their huts and the bus station should be as short as possible.



Question

Choose the best point for the bus stop.

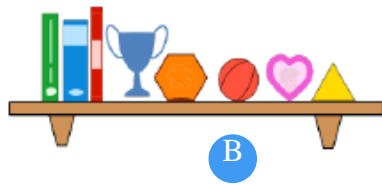
Exercise 23

Dana tries to arrange her shelf. where the collation rule is used:

1. That tall objects should not be next to each other.
2. Circular objects should not be next to rectangular objects.

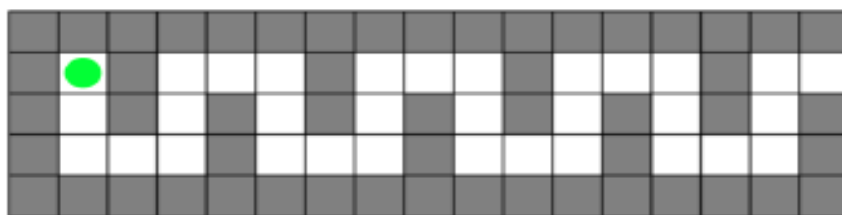
Question

Which of these shelves followed the correct arrangement according to the arrangement rule?



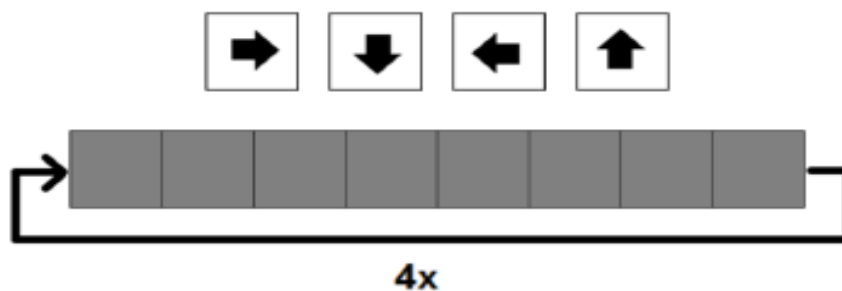
Exercise 24

Help the green robot put a set of instructions for him to exit the maze using the arrows and the robot will repeat the instructions only four times.



Question

Use the appropriate arrows to place a set of instructions for the robot:



Exercise 25

Amal placed her breakfast table as shown in the following image:



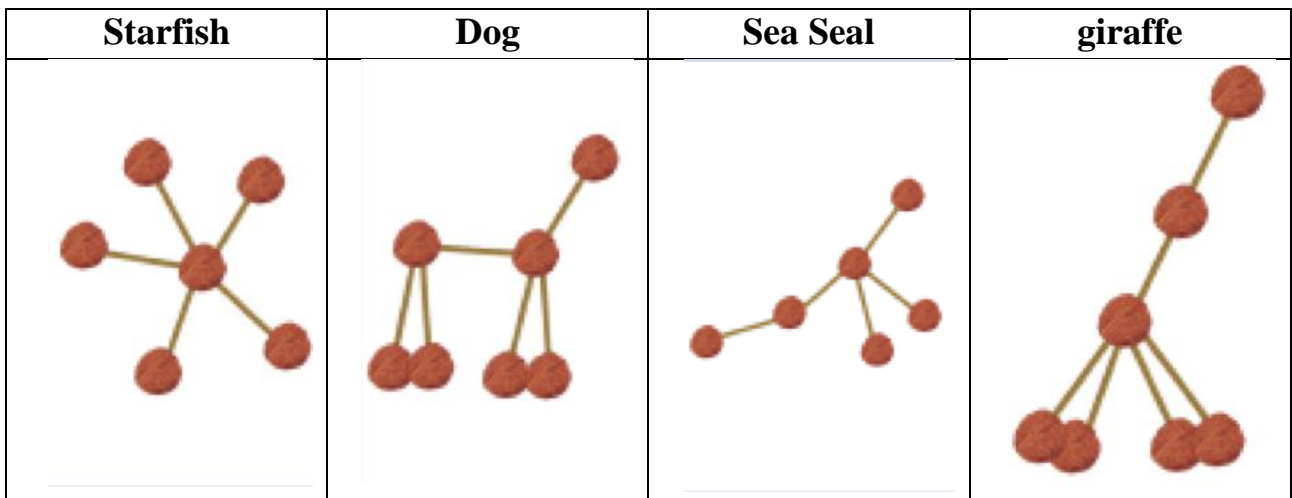
Question

In what order Amal put things on the table:

- A The table - the napkin - the cup and its Saucer - the knife - the plate
- B The table - the napkin - the cup and its saucer- the plate - the knife
- C The napkin - the knife -The table the cup and its saucer - the plate
- D The table - the napkin - the cup and its Saucer - the knife - the plate

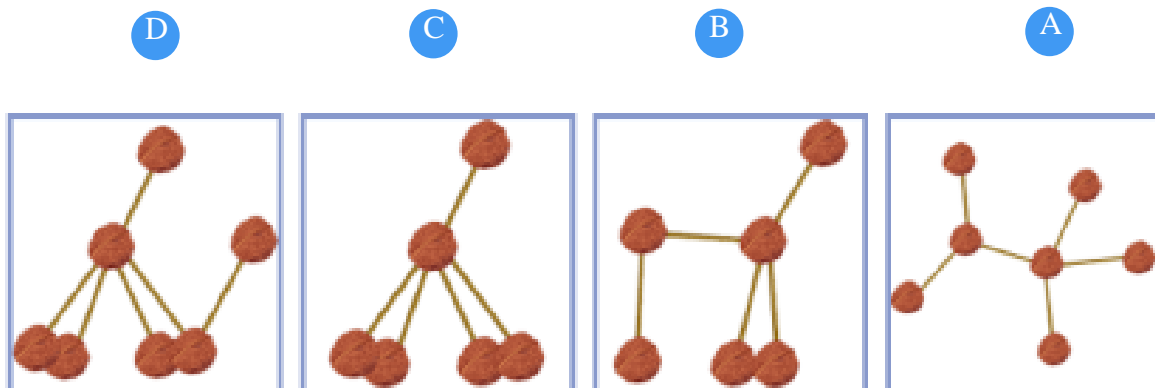
Exercise 26

Ahmed and his sister Fatima were playing in the woods. And Ahmed used pieces of wood and sticks to build four figures of animals. Fatima bends one of the sticks from the animals, thus creating the shape of the animal-dog.



Question

Any of the sticks in the following animal shapes can be folded back and rebuilt the dog animal shape.

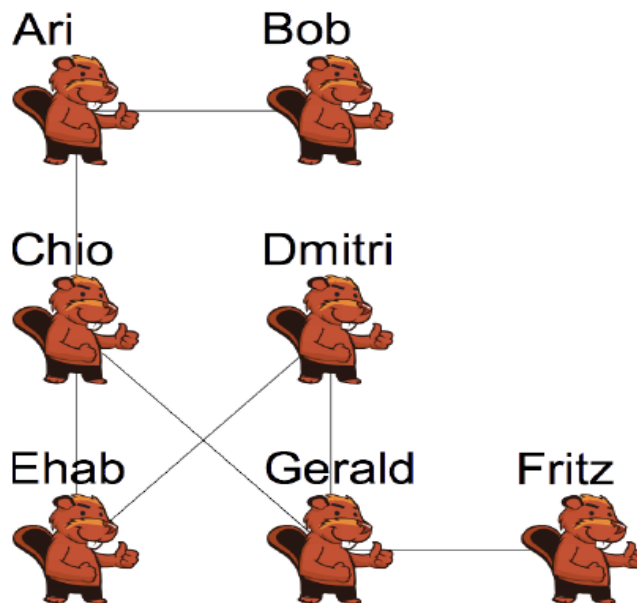


Exercise 27

We have seven beavers in a social network on the Internet, which is Instagram, as this network allows them to view pictures on their own pages and also on the pages of their friends.

In this chart in front of you: If the two are friends, we will find a line between them.

Usually, after the summer vacation, everyone publishes pictures of themselves on all of their friends' pages.



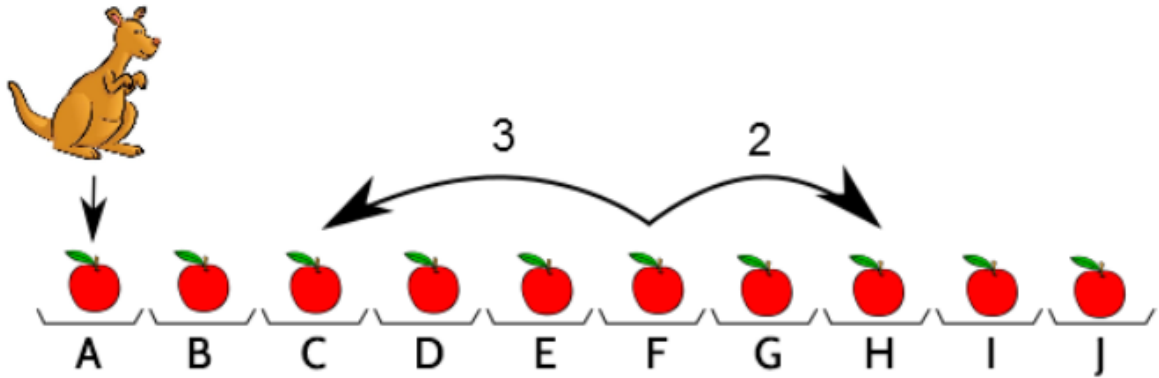
Question

Who is the beaver whose picture will be seen by the largest number of friends?

- A Ari
- B Bob
- C Chio
- D Ehab or Dmitri

Exercise 28

We have ten trays arranged in a row. There is one apple on each plate. Kangaroo loves to jump, so the kangaroo will first jump to the far left on the plate, which is symbolized by the letter A. For every single jump, he jumps two plates forward or back three plates in order to collect apples.



Question

If a kangaroo collects 10 apples, what is the last dish that the kangaroo collects apples from?

- A (A or B)
- B I or J
- C C or D
- D E or F

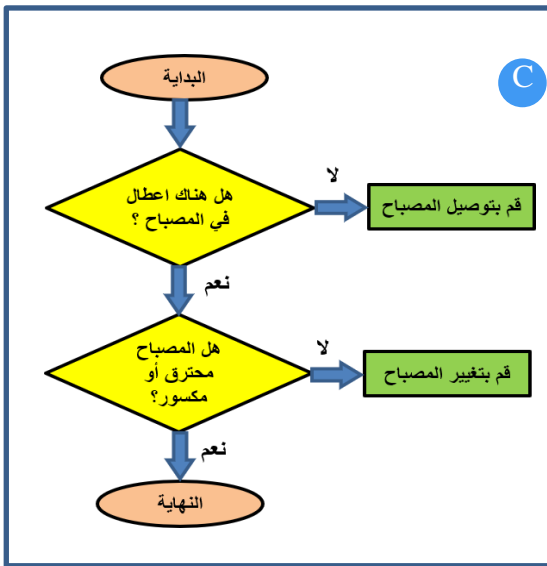
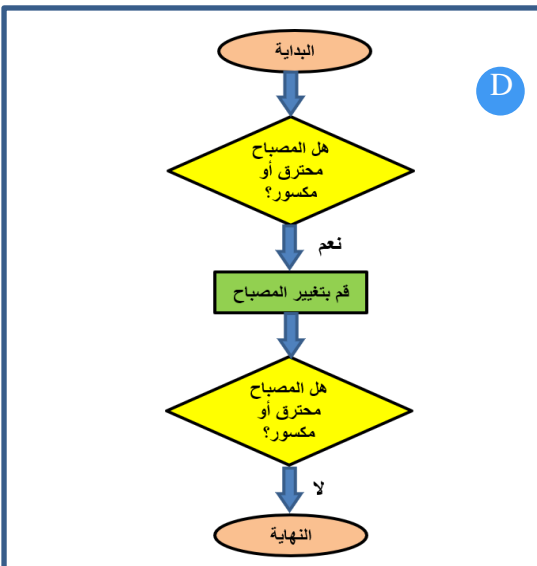
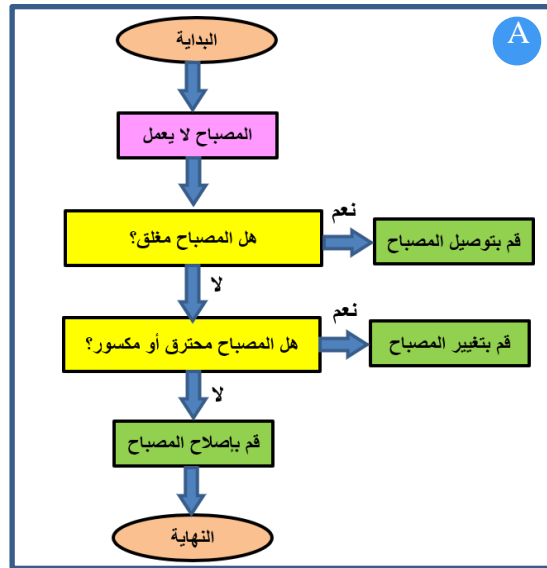
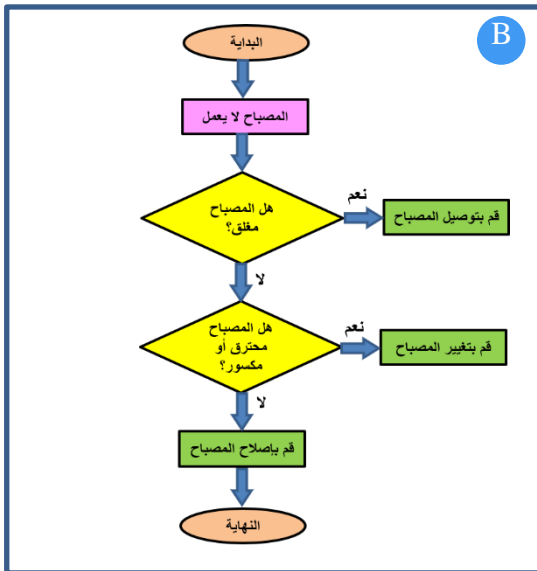
Exercise 29

Sarah wants to draw a flowchart that shows what she must do when the lamp fails. so that when the lamp is not working, she must do the following:

- Connect the lamp if it is switched off.
- Changing the lamp if it was broken or burnt.
- Repair the lamp except that.

Question

What flowchart did Sara draw for troubleshooting lamp faults?



Exercise 30

We want to create a program that draws the shape (1) by clicking on the buttons on the left. Figure (2) shows the order of the instructions needed to draw Figure (1), so the first instruction that will be placed will be executed first, then the second, and so on. The instruction style we create is repeated six times. .

Figure (2)

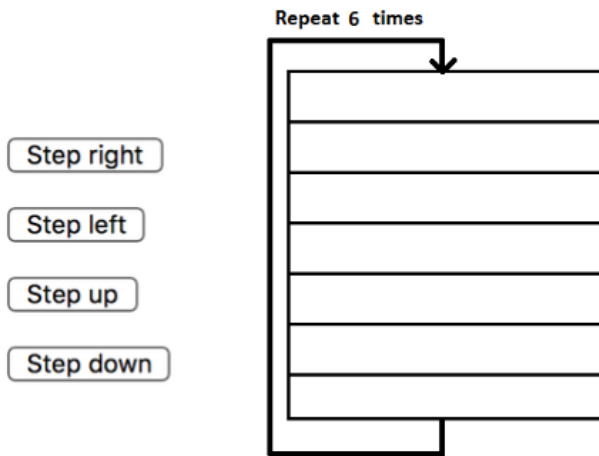
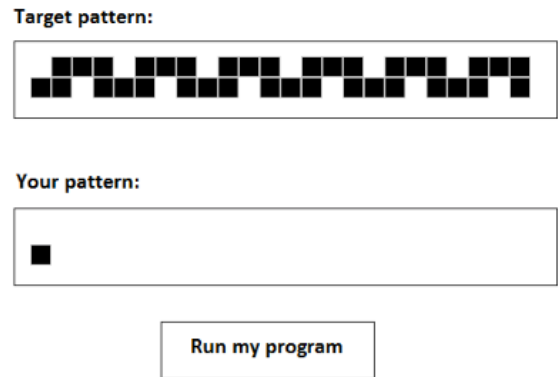


Figure (1)



Question

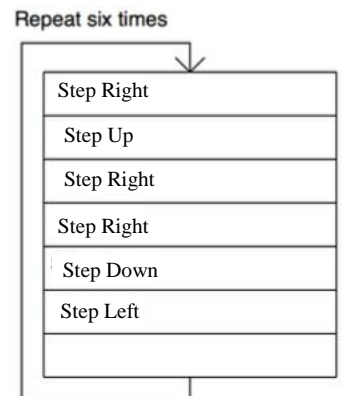
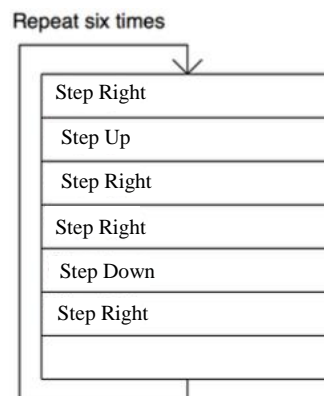
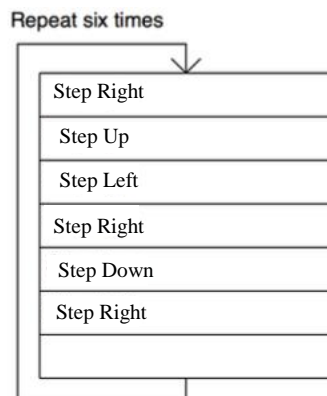
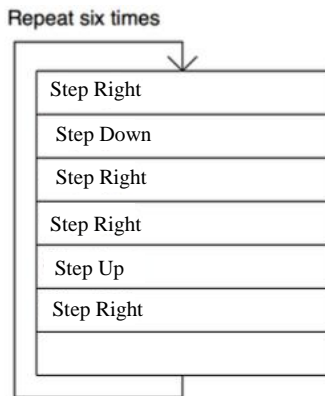
Which of the following is the correct order of instructions for configuring the target pattern?

A

B

C

D



Informative Websites for Developing

Computer Thinking Skills

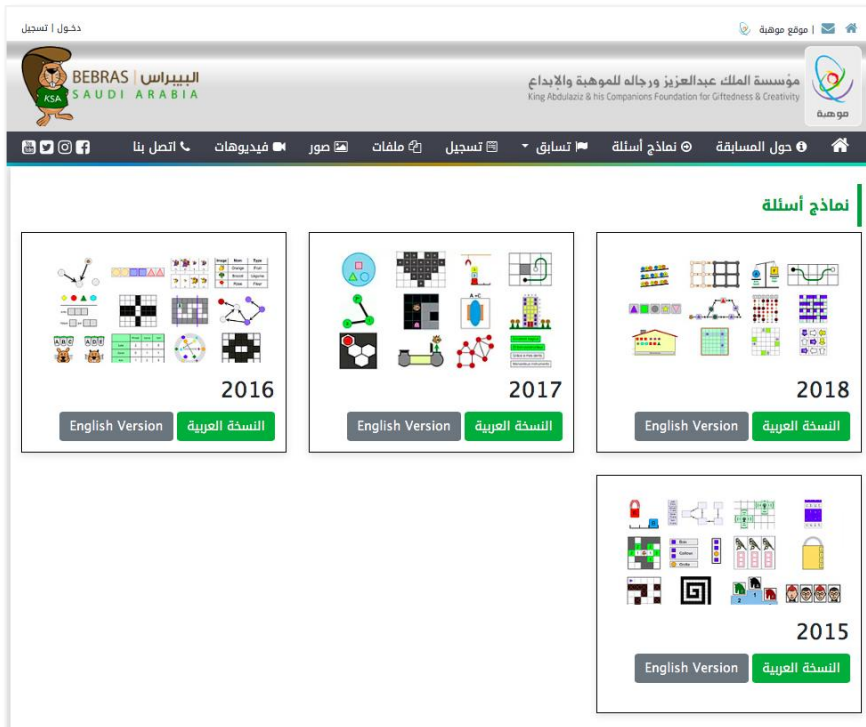


The Saudi Bebras website presents a set of interactive challenges that develop computer thinking skills. Challenges can be viewed by visiting the website via the link:

<https://www.bebrasksa.org/>



Choose the "Question Forms" tab and choose the challenges in either Arabic or English.



Each challenge reviews a set of interactive problems that must be solved all within 45 minutes, and upon solving each problem the student earns motivational points.

كامل الشاشة

ارجع لقائمة الأسئلة

44:27

point 0

<p>الأسهم الموجهه</p> <p>☆☆☆☆☆</p>	<p>الكرات الرخامية</p> <p>☆☆☆☆☆</p>	<p>لعبة الداما</p> <p>☆☆☆☆☆</p>	<p>من هناك</p> <p>☆☆☆☆☆</p>
<p>التبديلات</p> <p>☆☆☆☆☆</p>	<p>ترتيب الأعمدة</p> <p>☆☆☆☆☆</p>	<p>المسار المكتوب</p> <p>☆☆☆☆☆</p>	<p>قواعد الطلاب</p> <p>☆☆☆☆☆</p>
<p>المسار المزخرف</p> <p>☆☆☆☆☆</p>	<p>ميزان غير متناظر</p> <p>☆☆☆☆☆</p>	<p>الجدران المكسورة</p> <p>☆☆☆☆☆</p>	<p>اصطدام الروبوتات</p> <p>☆☆☆☆☆</p>

Each problem contains three levels, ranging from simple to more difficult.

كامل الشاشة

ارجع لقائمة الأسئلة

44:14

point 0

☆☆☆☆☆ من هناك

☆☆☆☆☆ المستوى

☆☆☆☆ المستوى

☆☆☆☆ المستوى

دخول

أبدا

فيما يلي الأشكال التي يمكن أن تدخل المنزل:

◆
■
▲
◈
★

لمساعدتك على التفكير، يمكنك إضافة نقاط أو خطوط هنا.

انقر على الزر الكبير "ابدا" للسماح للأشكال بدخول المنزل واحدا تلو الآخر.

يمكنك استخدام المربع الفارغ أثناء رسم نقاط أو خطوط لتذكير نفسك بما يجري.

في البداية، سيكون المنزل فارغ.

انقر على الزر الرمادي الكبير عندما يكون هناك 3 أشكال متماثلة في المنزل للحصول على درجة. قم بهذه العملية 3 مرات للحصول على الدرجة كاملة.

ابدأ من جديد

لم تحقق أي نقاط في هذا المستوى

bebras.org

About Organizing the contest Tasks Contacts

Bebras

International Challenge on Informatics and Computational Thinking



What is Bebras

Bebras is an international initiative aiming to promote Informatics (Computer Science, or Computing) and computational thinking among school students at all ages. Participants are usually supervised by teachers who may integrate the Bebras challenge in their teaching activities. The challenge is performed at schools using computers or mobile devices.



What does Computational Thinking involve?

Computational thinking involves using a set of problem-solving skills and techniques that software engineers use to write programs and apps. The Bebras challenge promotes problem solving skills and Informatics concepts including the ability to break down complex tasks into simpler components, algorithm design, pattern recognition, pattern generalisation and abstraction. [More about computational thinking.](#)



Dates

The second week of November is declared as World-Wide BEBRAS week for solving tasks. Some countries extended it to two weeks. Many countries run all-year-round Bebras activities like participants awarding events, second round of the challenge, summer campus, teacher workshops, collecting statistics and writing research papers. [Read more...](#)



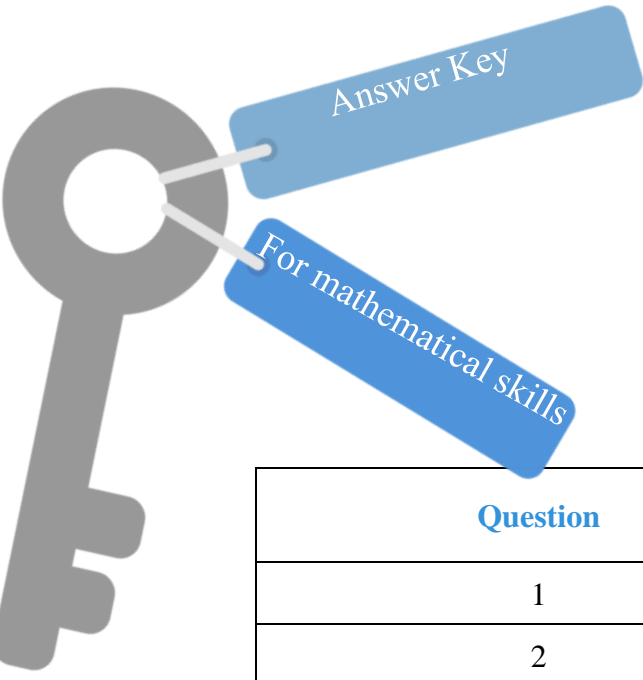





Keys to answers

Mathematics Skills and Computer Thinking Questions





Question	Correct Answer
1	A
2	E
3	B
4	E
5	C
6	D
7	B
8	D
9	A
10	B
11	B
12	D
13	A
14	A
15	B
16	C



Question	Correct Answer
1	B
2	C
3	C
4	A
5	D
6	D
7	D
8	C
9	A
10	C
11	D
12	D
13	D
14	D
15	C
16	A
17	D
18	A
19	C
20	D
21	
22	
23	C
24	
25	D
26	A
27	C
28	B
29	B
30	C

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- عزة علي آل كباس،(٢٠١٨/٨/١٦)، ما هو التفكير الحاسوبي ، خصائصه ومهاراته؟، رابط الموقع: <https://www.new-educ.com/Computer-Thinking-Its-Properties-and-Skills>

Foreign References

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- International Olympiad in Informatics. Available: <https://www.ioinformatics.org/>
- Egypt Beaver Competition Available: <https://www.beaveregypt.org/>
- 2019 Bebras - International Contest on Informatics and Computational Thinking workshop, Hungary.

prepared

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Done