Tasks T1 – T7 carry 3 points each
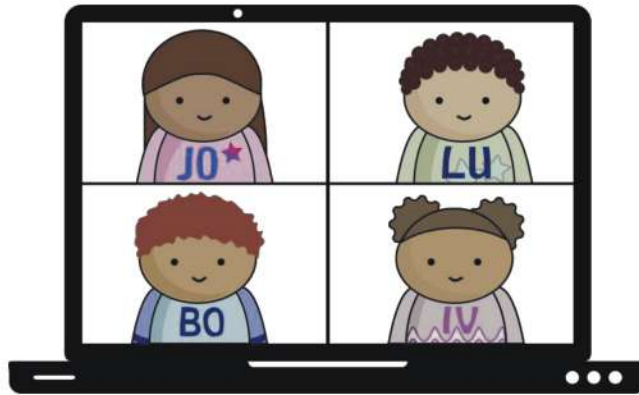
T1. Look in a mirror

In online meetings, you usually see your own image mirrored on your screen and don't even notice it, because you are so used to seeing yourself in the mirror.

Your friends BO, JO, LU and VI meet in a video chat. You can recognize them by the names on their shirts. One of them sent you a picture of their screen.

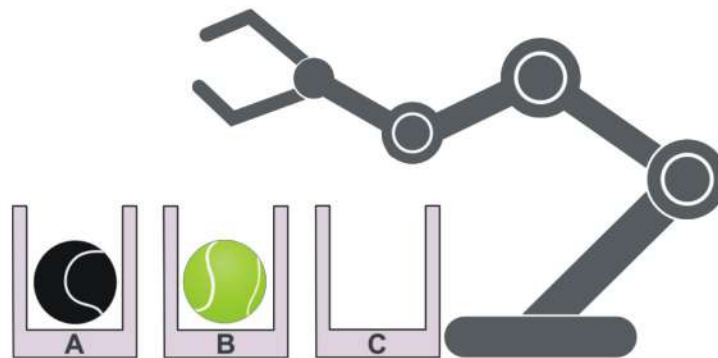### Question / Challenge

Whose screen are you looking at?

A) BO **B)** JO **C)** LU **D)** VI

T2. Robot Arm

There are two balls: one in tray A, and another in tray B. Tray C is empty.
The robot arm follows these steps in order:
1. Pick up the ball in A and put it in C.
2. Pick up the ball in B and put it in A.
3. Pick up the ball in C and put it in B.

Question / Challenge

When the robot arm is finished, which one of the following statements is true?

A) There are two balls in tray A. **B)** There are two balls in tray B.
C) Tray C is empty. **D)** Nothing has changed. Each ball is back in its place.

T3. Orange juice

The beavers are playing a logic game to drink orange juice.

John can drink from a bottle where:
- A) there is a bottle with less juice immediately to the left of this bottle, and
- B) there is a bottle with more juice immediately to the right of this bottle.

Question / Challenge

How many bottles can John drink from?

A) 3   **B)** 2   **C)** 5   **D)** 6

T4. Cupcakes

Bebras Bakery produces cupcakes for the hard-working hungry beavers in the town. Each cupcake is decorated with three sweet layers. Firstly, each cupcake gets an icing layer, then a toppings layer, and finally a fruit layer. Each of the layers is changed from one cupcake to the next.

The icing layer changes by the following pattern:

green → white → red → blue → [repeats again starting with green]

The toppings layer changes by the following pattern:

sprinkles → chocolate flakes → toasted nuts → [repeats again starting with sprinkles]

The fruit layer changes by the following pattern:

cherry → kiwi → strawberry → orange → blueberry → [repeats again starting with cherry]

The picture below shows cupcakes on the production line at some point during the day, as they move in a left to right manner.
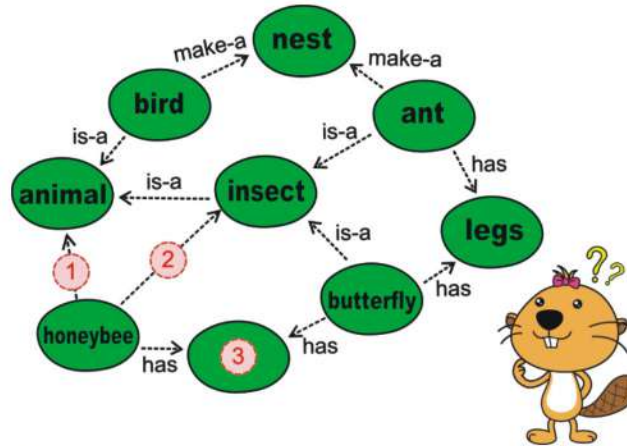

Question / Challenge

What will the cupcake marked with "**X**" look like?

Red, sprinkles, orange	White, chocolate flakes, kiwi	Blue, toasted nuts, strawberry	Blue, sprinkles, orange
A)	**B)**	**C)**	**D)**

T5. Chain of memories

Beaver Grace wanted to remember what she learned in class, so she expressed it in a picture as follows. In order to express 'An insect is an animal', she drew an arrow pointing from 'insect' to 'animal', and wrote 'is-a' on it.
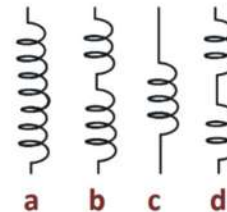

Question / Challenge

Which of the following is correct for ①,②,③ in her picture given above?

	①	②	③
A)	has-a	is-a	wings
B)	has-a	has-a	head
C)	is-a	make-a	bone
D)	is-a	is-a	wings

T6. Springs

Beaver Dan used 4 steel wires (a, b, c and d) to make the following springs.
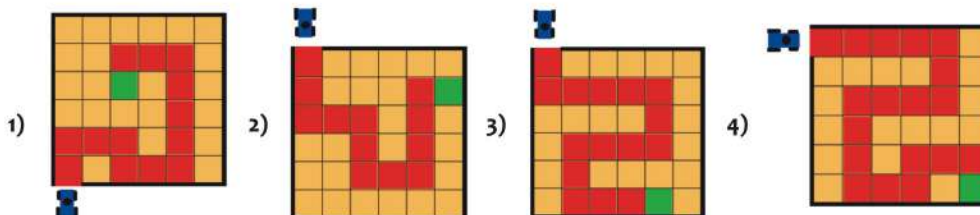

Question / Challenge

Which of the following sequences shows the 4 wires in the ascending order of their length?

A) a < b < c < d   **B)** c < d < b < a   **C)** a = b = c = d   **D)** c < d = b < a

T7. Cars

Cars are John's hobby and today he practiced the right turn. John's routes are marked in red on the following maps. The starting point is the blue car and the arrival point is the green square.

Question / Challenge

In which case does the car make more than two right turns to reach the green square?
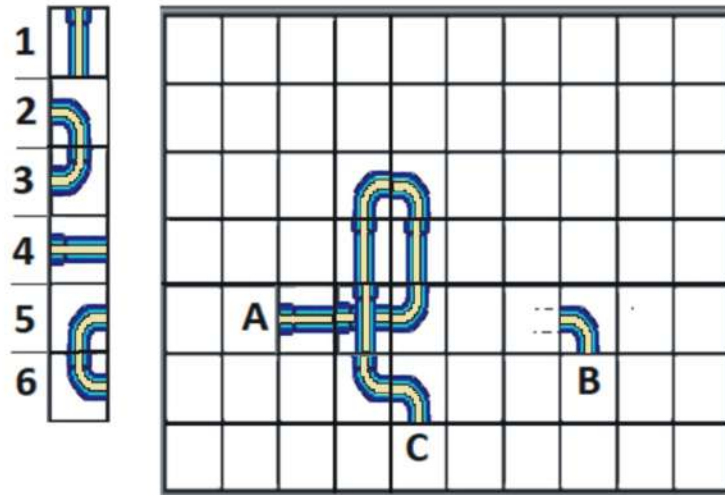
A) 1   **B)** 2   **C)** 3   **D)** 4

Time Allowed: 120 minutes

Tasks T8 – T14 carry 4 points each

T8. Pipe puzzle

Dan has to complete the puzzle such that a pipe will join points A and B from the next image. He can use pieces 1-6, which are available in any quantity, but he cannot rotate or mirror them.

Question / Challenge

If the ordered sequence of pieces 4-4-3-1-2-5-1-1-6-2 describes the portion AC of the pipe, which of the following sequences could represent the portion CB of the pipe?

A) 6-4-3-1-5-2   B) 6-3-1-1-4-2-6   C) 6-6-3-1-5-2   D) 6-4-3-1

T9. Sharing

Ana has received a candy and wants to share it with one of her friends, Yvonne or Magdalena. Magdalena is also friend with Mary and Rebecca. Yvonne is also friend with Rebeca.

Ana   Mary   Magdalena   Rebecca   Yvonne

After Ana shares her candy with Yvonne or Magdalena, they will give her back half of their candies as well as half of the candies of all their other friends. In the picture you can see all the girls, each with the number of the candies they have.
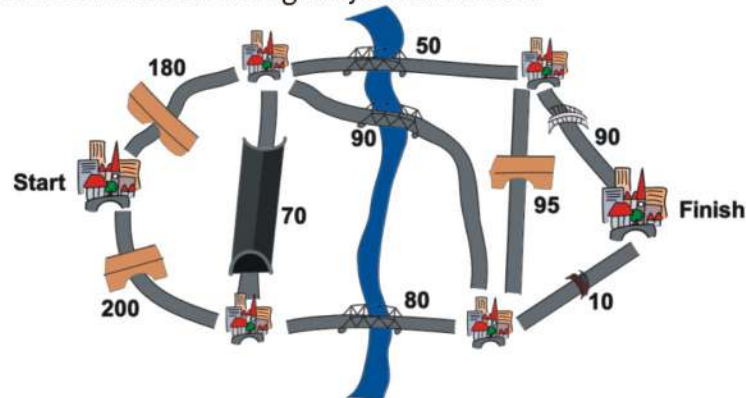
Question / Challenge

What is the maximum number of candies that Ana could receive when sharing her candy with Yvonne or Magdalena?

A) 4   B) 5   C) 9   D) 10

T10. Best Route

Trucks travel between cities on the highways shown below.

Bridges and tunnels limit how high trucks can be. Specifically, the label on each highway is the maximum height of a truck that can use the highway.

Question / Challenge

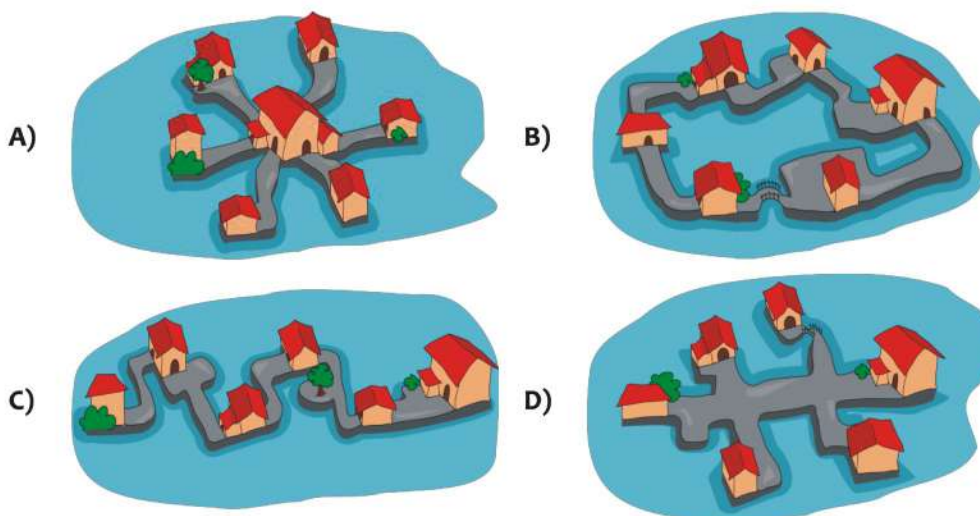What is the maximum height of a truck that can be sent from Start to Finish?

A) 70   B) 85   C) 90   D) 120

T11. Visits in a lake village

There are 4 villages on the Turquoise lake. The inhabitants of a village like to visit each other. Because they do not have any boats they only use the roads connecting houses. Everybody who visits any other house locks their own house so nobody else could go through their house. Some of these villages are built better so that visiting is easier to do.

Question / Challenge

Which is the village where anyone can visit anybody else independent of how many inhabitants are at home?

A)   B)

C)   D)

T12. Self Health B

Beaver Dean visits a self-help health website because he is not feeling well. He gets a list of questions that everyone needs to answer. Depending on his answer to each question, he will be directed to some advice or another question. He starts at question 1.

1. Have you had a fever for the past three days?
   If your answer is YES, then go to Question 2.
   If your answer is NO, then go to Question 4.
2. Are you feeling pain in any part of your body?
   If your answer is YES, then go to advice 3.
   If your answer is NO, then go to Question 5.
3. Go to see a medical doctor immediately!
4. Can you count down from 20 to 1?
   If your answer is YES, then go to advice 7.
   If your answer is NO, then go to advice 8.
5. Are you feeling dizzy?
   If your answer is YES, then go to advice 6.
   If your answer is NO, then go to Question 4.
6. There is something wrong and you should give your body a rest immediately!
7. Your concentration is intact, but you should give your body a rest.
8. Your concentration seems to be failing, please ask a friend to sit beside you.

Question / Challenge

Dean's answers in order are: YES, NO, NO, NO. What advice does he get?

A) 1   **B)** 2   **C)** 4   **D)** 8

T13. Presents program

A group of friends give each other presents according to these rules:
- Rule 1: No friend can give a present to themselves.
- Rule 2: Each friend must give one present.
- Rule 3: Each friend must receive one present.

For instance, a group of **two friends**, they would give each other presents as in this figure:

which means that Cathy Cat should give a present to Mo Mouse, and Mo Mouse should give a present to Cathy Cat.

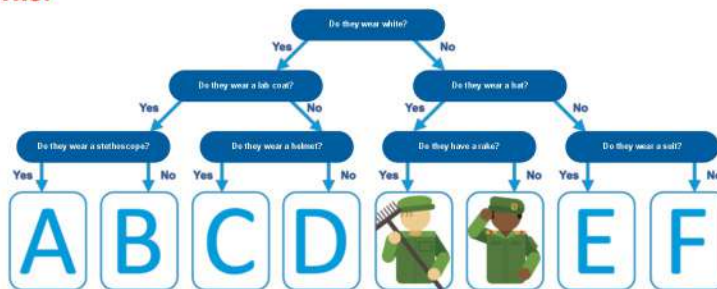For a group of **four friends**, you are given the following options.

Question / Challenge

One of the following figure does not follow the rules! Which one?

A)

B)

C)

D)

T14. Guess Who?

A B C D E F

Jack and Jill each have the same 8 cards with a picture of a person and their profession on them. They are playing a quiz game using the cards. Jack hides one of his cards and Jill must guess the profession on the hidden card through several questions. Jill only asks one question at a time and Jack must answer only 'yes/no'.

These are Jack and Jill's cards (left to right, top to bottom): painter, gardener, scientist, carpenter, businessman, doctor, astronaut, soldier.

Question / Challenge
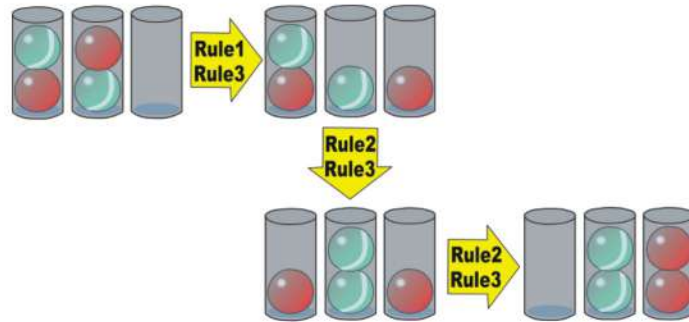
What is the profession in spaces A to F in order?

A)

B)

C)

D)

Tasks T15 – T21 carry 5 points each
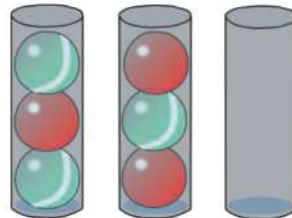
T15. Moving the ball

Beavers are playing a game of moving a ball in a cylinder. The goal of this game is to classify balls by color in cylinders. The rules of this game are as follows.

- Rule #1: The ball can be moved to another cylinder with no ball.
- Rule #2: When there is a space in the cylinder, the ball can only be moved on a ball of the same color in another cylinder.
- Rule #3: Only one ball at the top of a cylinder can be moved at one step.

Question / Challenge

Starting from the configuration below, what is the least number of moves you need to make to solve the game, according to the rules above?

A) 5   **B)** 6   **C)** 7   **D)** 8

T16. Bank Lock

In the Bebras Bank, the passcode to the safe is a combination of three out of eight symbols:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

The passcode automatically changes every day.

To change the passcode, each symbol is shifted to the right. That is:

The symbol is replaced by the symbol right to it.

The rightmost symbol is replaced by the leftmost symbol.

For example:

If on Sunday the passcode is ,

on Monday the passcode will be .

Last Sunday, a bank manager set the passcode to
Then, he wrote a list of passcodes for some days of the following week. But he made one mistake.

Question / Challenge
Which of the passcodes is **WRONG**?

A) Wednesday:

B) Thursday:

C) Friday:

D) Saturday:

T17. Beaver pong

A beaver plays with his friends. He throws 3 balls into jars. He's very good at this game and all three balls always end up in jars.
The score for each jar is shown on the picture below:

Question / Challenge
Which of the following scores the beaver could NOT have obtained?

A) 25   B) 33   C) 12   D) 28

T18. Cat Pictures

Aika loves taking pictures of her cat and posting them on Bebragram.
To make a time-lapse video of her kitten's first 3 years, she has to download all the pictures onto her computer and name them properly.
The computer orders pictures by name, from a to z and from 0 to 9. Aika wants her pictures ordered from oldest to newest, so she always adds the date to the name.
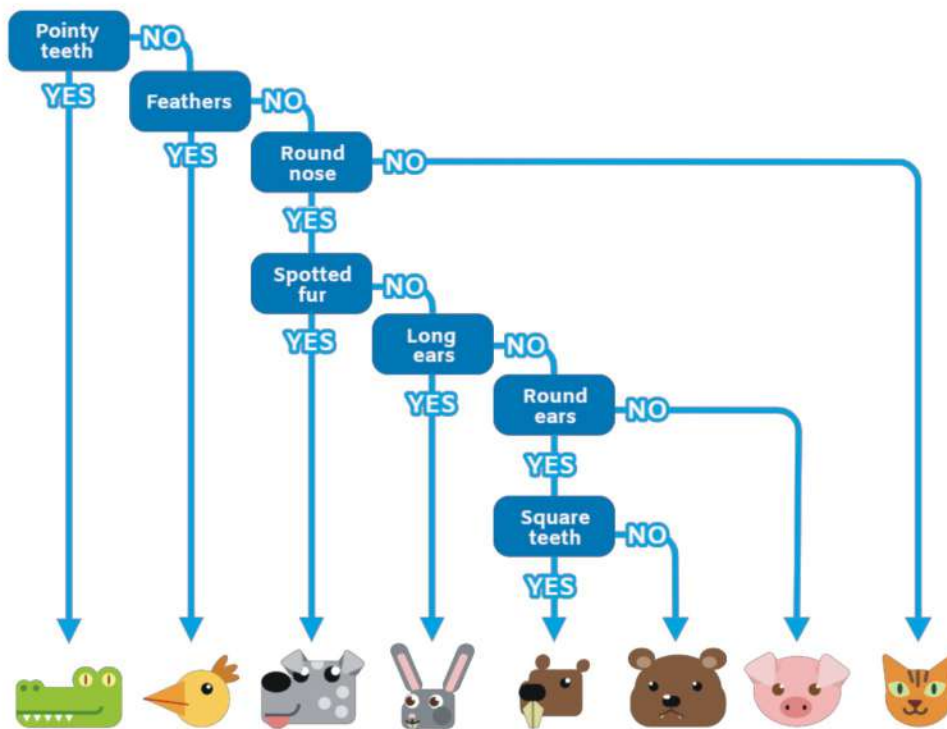
Question / Challenge

Which filename pattern should Aika use? (The examples are for August 19, 2021.)

A) cat_august_19_2021 **B)** cat_19_8_2021
C) cat_2021_19_8 **D)** cat_2021_08_19

T19. Animal sorting

The animal species in Beavertown can be distinguished by their features. To identify an animal, we use a decision tree. When the answer to a question is yes you go down and when the answer to a question is no you go right.

The decision tree below distinguishes between eight different animal species. Some animals can be identified with just one question, others need seven questions before they are identified.

Question / Challenge

Which animals need more than three questions before we can identify them with this decision tree?

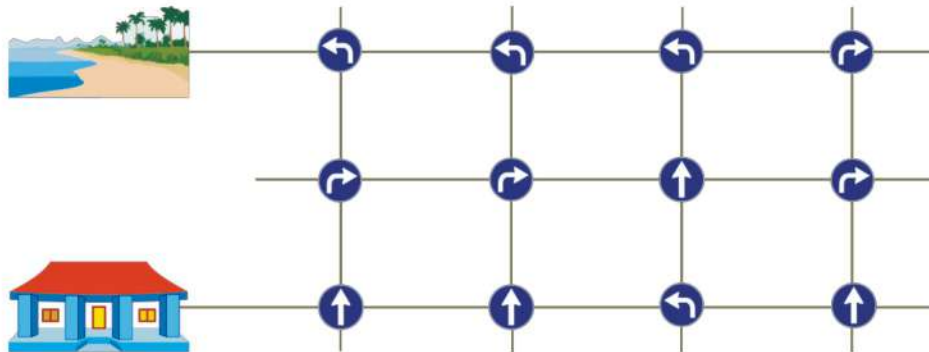### T20. Self-Driving Cars

Some new models of self-driving cars are under test. The cars can recognize traffic signs, but sometimes they fail to recognize a sign. When a car does not recognize a sign, it will ignore it and keep driving straight ahead. These are the signs used on the test track and their meanings:

↑	Drive straight ahead.
↱	Turn right here.
↰	Turn left here.

This is the map of the test track:

Each sign has always the same meaning, whatever is the direction of a car. For example, for a car just leaving the school, the sign on the first crossroad means "drive straight ahead", so that at the next crossroad it gets the same sign.
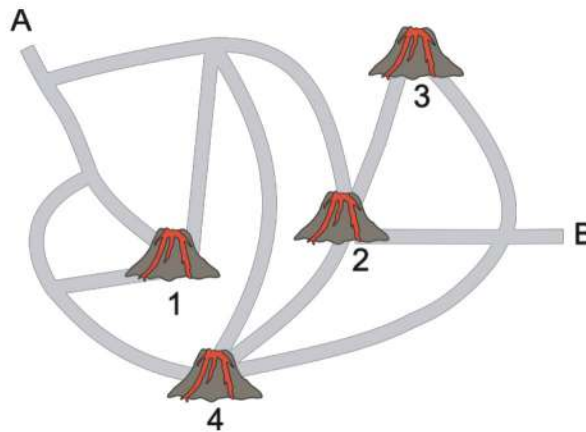
Question / Challenge

Starting from the school, which of the following cars reaches the beach?

A) Car A fails to recognize the third sign it encounters.
B) Car B fails to recognize the fourth sign it encounters.
C) Car C fails to recognize the fifth sign it encounters.
D) Car D fails to recognize the sixth sign it encounters.

T21. Volcanos

Dino wants to get from point A to point B.

For the safety reasons, if a volcano erupts, all the roads connected to the volcano are closed up to the next intersection.

Question / Challenge

Dino is very worried: if volcanoes erupt, will he be able to reach his destination?
Which two volcanoes must erupt at the same time so that Dino can NOT reach his destination?

A) volcanoes 1 and 2

B) volcanoes 3 and 4

C) volcanoes 2 and 4

D) volcanoes 1 and 4