BRAINIACS OLYMPIAD

GRADES 5-7

CODING SAMPLE CHALLENGES

ORGANIZED BY ©BRAINIACS OLYMPIAD COMMITTEE

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CODING SAMPLE PAPER-GLOBAL FINAL
Grade: 5-7
Time: 120 minutes
Total points: 100
Equipment: Laptop

Easy challenges

Task 1
Goal: Create a program in Scratch where the sprite calculates how many years remain until the user turns 50.
Requirements:
The sprite asks the user: “How old are you?”
The sprite calculates: 50 – age.
The sprite says: “In ___ years you will be 50.”

Task 2
Goal: Create a program in Scratch where the sprite changes color when clicked.
Requirements:
Each time the sprite is clicked, its color changes to a new one.
One click = one color change.
Colors can be any, as long as the change happens on every click.

Task 3
Goal: Create a program in Scratch that determines the sign of the entered number and changes the sprite’s color.
Requirements:
The sprite asks the user: “Enter a number.”
The sprite says: “The number is positive/negative/zero.”
If the number > 0 → the sprite turns red.

If the number < 0 → the sprite turns blue.

If the number = 0 → the sprite keeps its original color.

Task 4
Goal: Create a “Traffic Light” animation with a moving car.
Requirements:
Draw sprites: a traffic light and a car.
Red light → the car stops (“Stop”).

Yellow light → play an engine sound (“Wait”).

Green light → the car drives forward (“Go”).

Task 5
Goal: Create a program in Scratch where the sprite says a random compliment.
Requirements:

The sprite randomly selects one of five compliments:
“You look great today”
“You have amazing eyes”
“Nice hairstyle”
“Excellent book choice”
“You play football well”
After selecting, the sprite says or displays the compliment.

Task 6 – Date Check
Task: Create a program in Scratch where the sprite checks whether the entered date exists.
Program logic:
The sprite asks the user:
“Enter the day number (day of the month):”
If the user enters a number from 1 to 31 (inclusive), the sprite says:
“The stars say you’ll be lucky today!”
If the number is negative, 0, or greater than 31, the sprite says:
“Such a date does not exist in a month.”

Task 7
Goal: Create a program in Scratch where a basketball jumps a specified number of times.
Requirements:
The sprite “Basketball” asks the user: “Enter a number N.”
The ball jumps N times (up–down animation).

Task 8
Goal: Create a Scratch program — a sleep time calculator.
Requirements:
The sprite asks the user: “How many hours do you sleep per day?”
The sprite calculates: hours × 7 days.
The sprite says: “You sleep ___ hours per week.”

Medium challenges

Task 1
Goal: Create a Scratch program that compares two numbers.
Requirements:
The sprite asks: “Enter the first number” and “Enter the second number.”
The sprite says which number is greater.
If the numbers are equal, the sprite says: “The numbers are equal.”

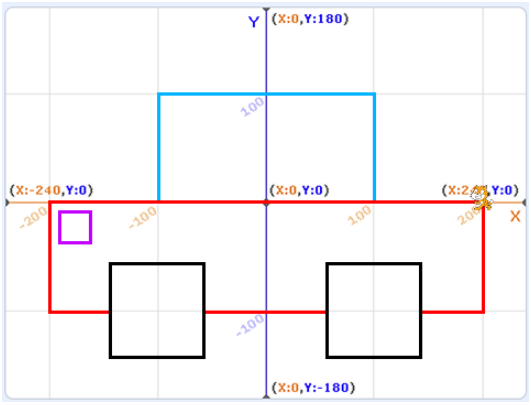
Task 2
Goal: Create a Scratch mini-quiz for addition.
Requirements:
The sprite selects two random numbers a and b from 0 to 100.
The sprite asks: “What is the sum of a + b?”
If the answer is correct → play an applause sound.

If the answer is incorrect → play an “ouch” sound.

Task 3
Goal: Create a Scratch program where the sprite draws lines while following the mouse.
Requirements:
The sprite follows the mouse pointer.
If the space key is pressed, the sprite leaves a line behind it (use the Pen tool).
If the space key is not pressed → no lines are drawn.

Lines should appear only while the space key is being held down.

Task 4
Using the Pen blocks, draw the picture shown below.

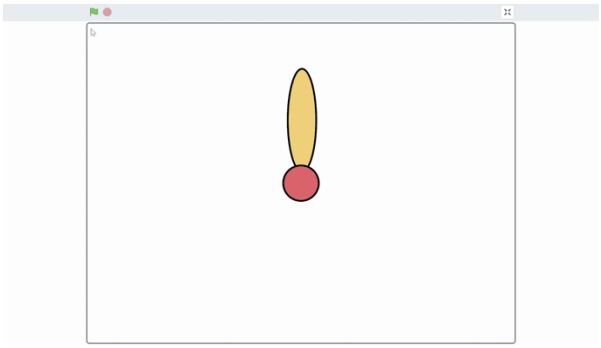


Task 5
Goal: Create a Scratch program that draws a flower with a specified number of petals.
Requirements:
Draw a sprite called “Petal.”
The sprite asks the user: “How many petals does the flower have?”
After the number is entered, the sprite creates cloned petals one by one.
Each new petal rotates by an angle: 360° ÷ number of petals.
Example:

3 petals → rotation 120°

5 petals → rotation 72°

As a result, a flower with evenly spaced petals appears on the stage.



Task 6
Goal: Create a Scratch program with a robot vacuum and clones of trash.
Requirements:
Add the sprite “Robot Vacuum” (size 50) and the sprite “Trash” (size 30).
The “Trash” sprite asks the user: “How much trash is on the stage?”
Trash clones appear in different random positions on the stage.
The robot vacuum follows the mouse pointer.
If the robot touches the trash → the trash disappears.

Task 7
Goal: Create a Scratch program that determines the time of day based on an entered number.
Requirements:
The sprite asks the user: “Enter the current time (0–23).”
After input, the sprite determines:
5–11 → “It’s morning!”

12–16 → “It’s daytime!”

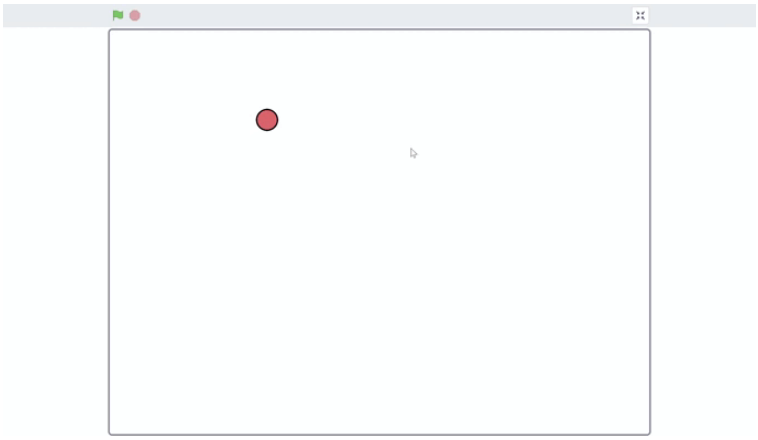
17–20 → “It’s evening!”

21–4 → “It’s night!”

The background changes depending on the time of day (night → background with the moon).
If an incorrect number is entered → the sprite asks to enter again.

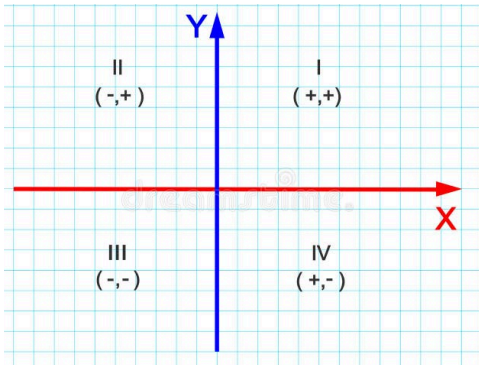
Task 8
Goal: Create a Scratch program in which the sprite draws a staircase with N steps.
Requirements:
The sprite asks the user: “Enter the number N (number of steps).”
After entering the number, the sprite draws a staircase consisting of N rectangular steps.

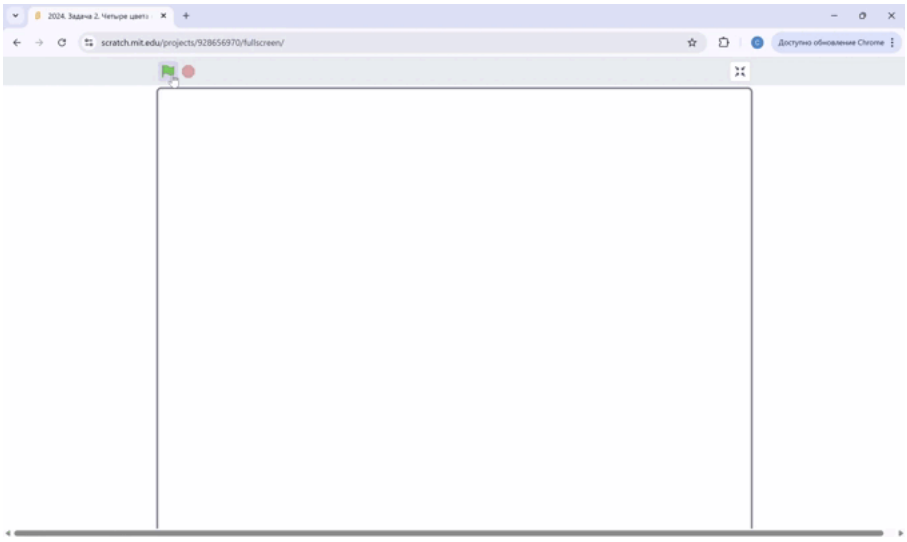
The pen color changes for each step so the staircase is multicolored.



Hard challenges

Task 1
Goal: Create a Scratch program where clones of the “Ball” sprite move across the stage and change color depending on the area.
Requirements:
Create a sprite called “Ball.”
Create 20 clones of this sprite.
The clones move across the stage as shown in the GIF animation.
Depending on their coordinates (stage area), the ball changes its color.
All movements and color changes occur simultaneously for all clones.





Task 2
Mini ATM
Goal: Create a Scratch program where a sprite works as a simple ATM.
Requirements:
The sprite asks the user to enter a PIN code.
If the PIN is incorrect → the sprite says “Error” and asks to enter again until the correct PIN is entered.
After the correct PIN, the sprite shows a menu: “Deposit money” or “Withdraw money.”
The user selects an action and enters an amount.
Deposit → the balance increases by the entered amount.

Withdraw → the balance decreases only if there are enough funds; otherwise the sprite says “Insufficient funds.”
After each operation, the sprite shows the current balance and displays the menu again.
The program continues until the user selects “Exit.”

Task 3
Goal: Create a Scratch program using clones and sprite interaction.
Requirements:
Add two sprites: “Dragonfly” (size 30%) and “Frog” (size 25%).
The “Dragonfly” sprite asks the user: “How many clones should be created?”
Example: if the user enters 2, then 2 clones of the dragonfly are created.
When a clone appears, it moves for 0.5 seconds to a random position on the stage.
If the dragonfly touches the frog → the clone disappears and a counter increases by 1.

The frog is controlled by following the mouse pointer.
The program displays how many clones were caught by the frog.

Task 4
Goal: Create a Scratch program that draws a Christmas tree with a specified height.
Requirements:
The sprite asks the user: “Enter number N — the height of the tree.”
The number N determines how many horizontal lines form the tree.
Using the Pen tool, the sprite draws the tree:
Each next line is shorter than the previous one.
Each line has a new color.
As a result, a tree made of N multicolored lines appears on the stage.