RACING AND WRESTLING

STEMJAM Teaching Guide

Developing make spaces to promote creativity around STEM in schools
Acronym: STEMJAM
Project no. 2016-1-ES01-KA201-025470

www.stemjam.eu

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RACING AND WRESTLING

ABSTRACT

The controlling mBots by Bluetooth and wireless technology. Preparing the rough surface for mBots wheels to prevent skidding. Preparing the fields for mBots racing and wrestling.

Through a game programmed in Scracth (mBlock Software), the students will have to answer different questions, if they succeed the mBot will advance, but if they fail, it will go back. But there is more, the two mBot will be linked through a rope, so the first one that manages to push the other mBot towards his field, will win the battle.

DIDACTIC OBJECTIVES

TECHNOLOGY

- Writing the necessary codes by keyboard control.
- Wireless technology knows how to control the mBot.
- Bluetooth and wireless technology controls the mBot on narrow road and bordered field.
- Student's interest increases with amusing learning.

Learn to program a game, know general culture questions and the strategy to answer before or after the rival team.

STEM Subject: Science☒ Technology ☒ Engineering☐ Mathematics☐

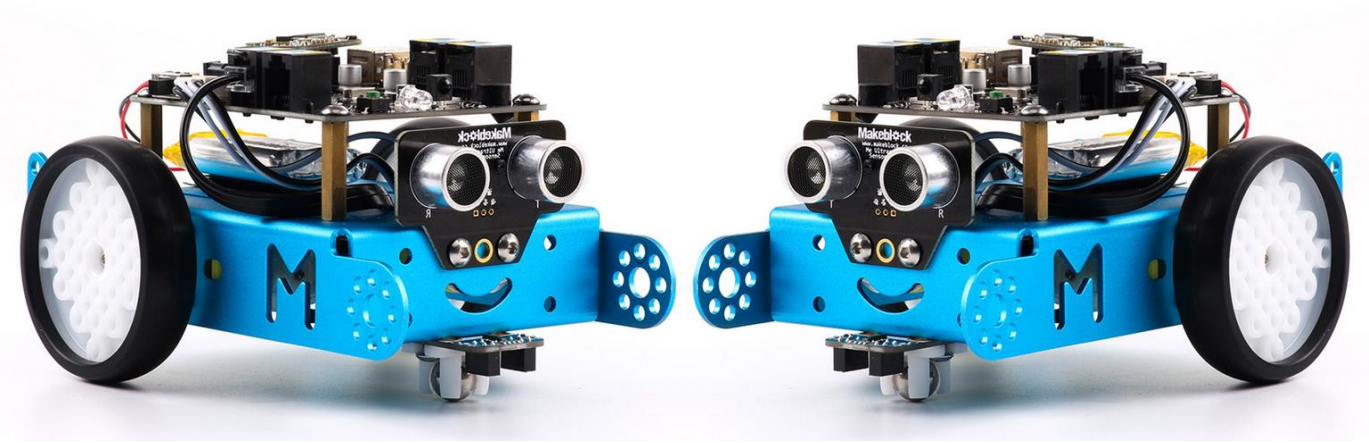
Education Level: 12-14 years☐ 14-16 years☒

PROBLEM STATEMENT

Create a video game with Scratch and at the same time be connected to the mBot.

BOM (Bill of Materials Needed)

- (x2) mBots => Ref. 90054



- Different beams and structures:

- Cardboards, pens, painting, etc.
- Colourful tapes.
- Rough Surface.
- A Rope.

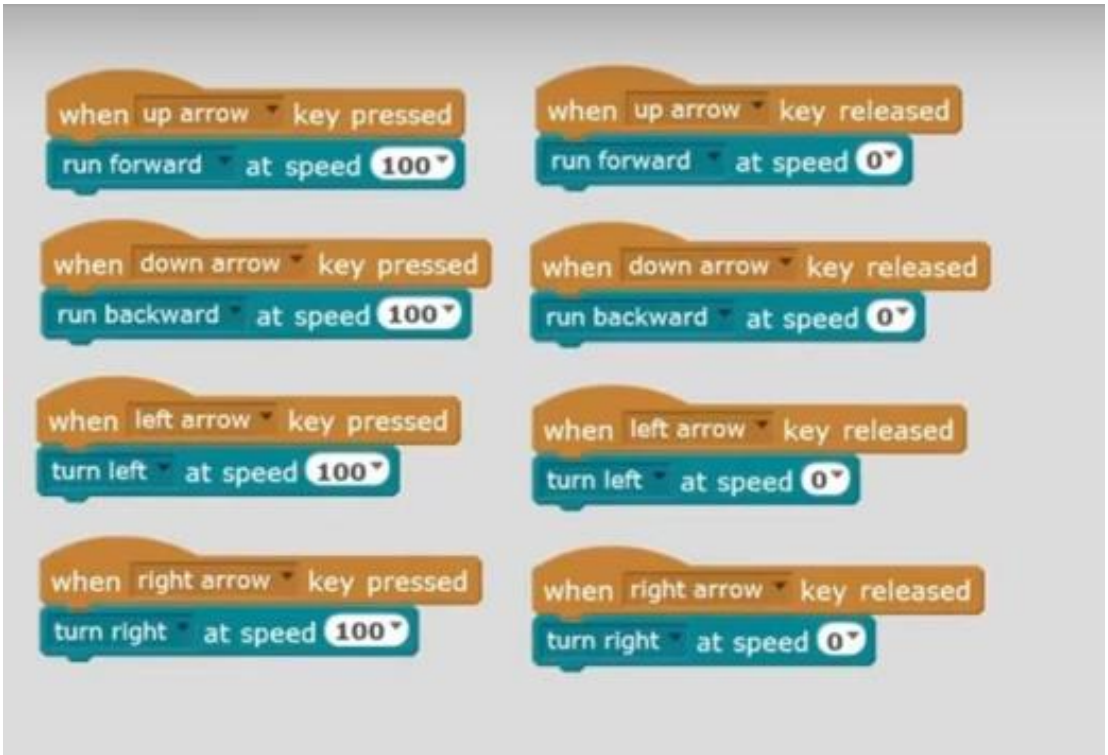
ACTIVITY DESCRIPTION

First version

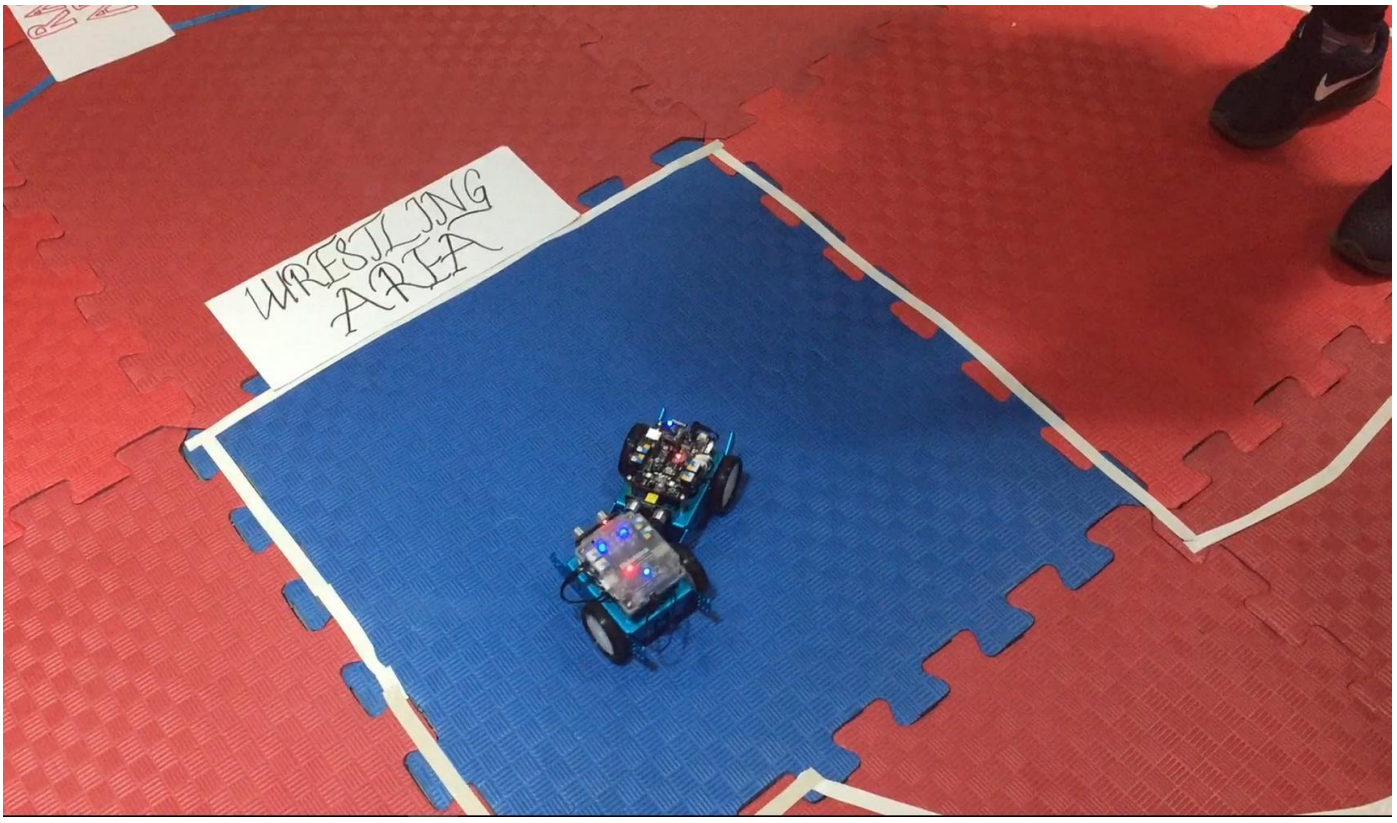
Step 1: Rough surface is prepared for comfortable movement of mBot.

Step 2: Information about areas of racing and wrestling

Step 3: To Code for Wireless connection and to set Bluetooth connection

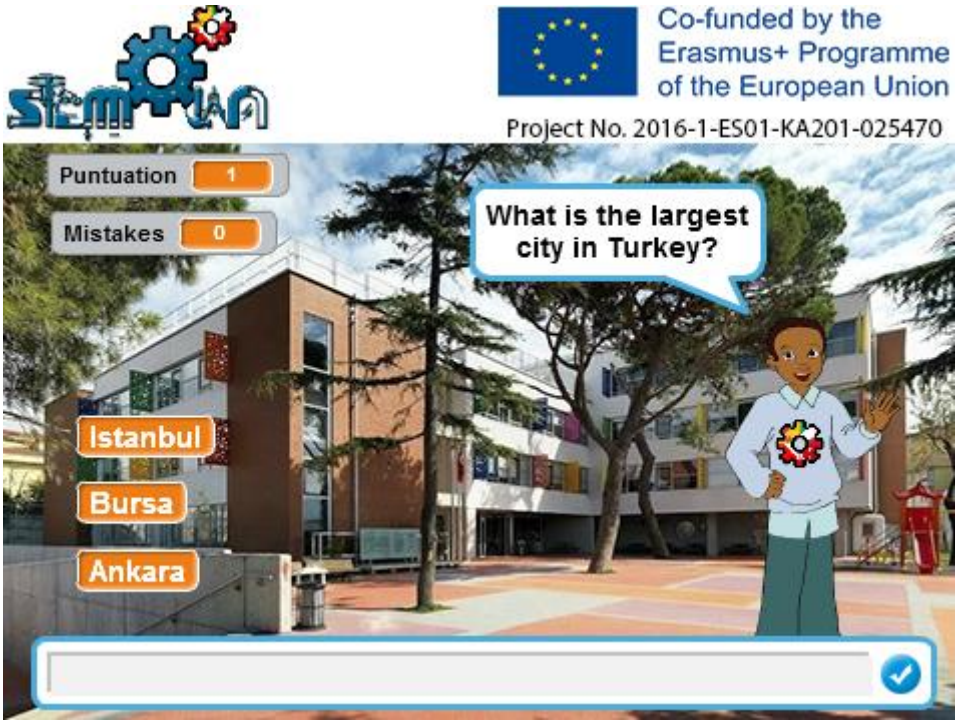


Step 4: Improvement of mBot control ability.

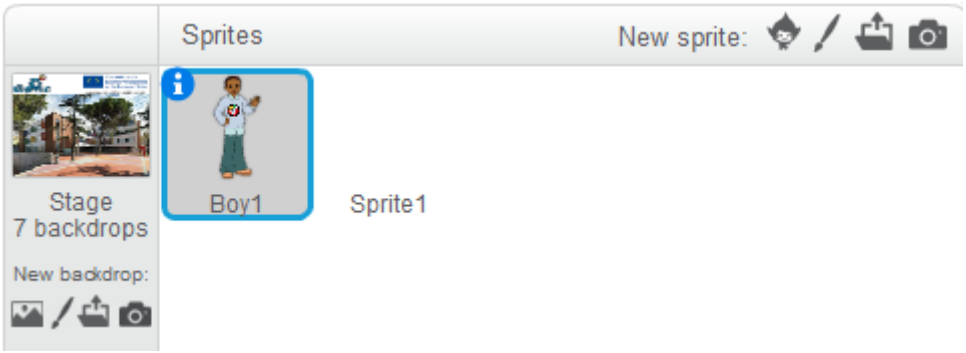


Second version

First, we will decide what kind of game we want to play. In this case, we have opted for a game of questions and answers (quiz game).

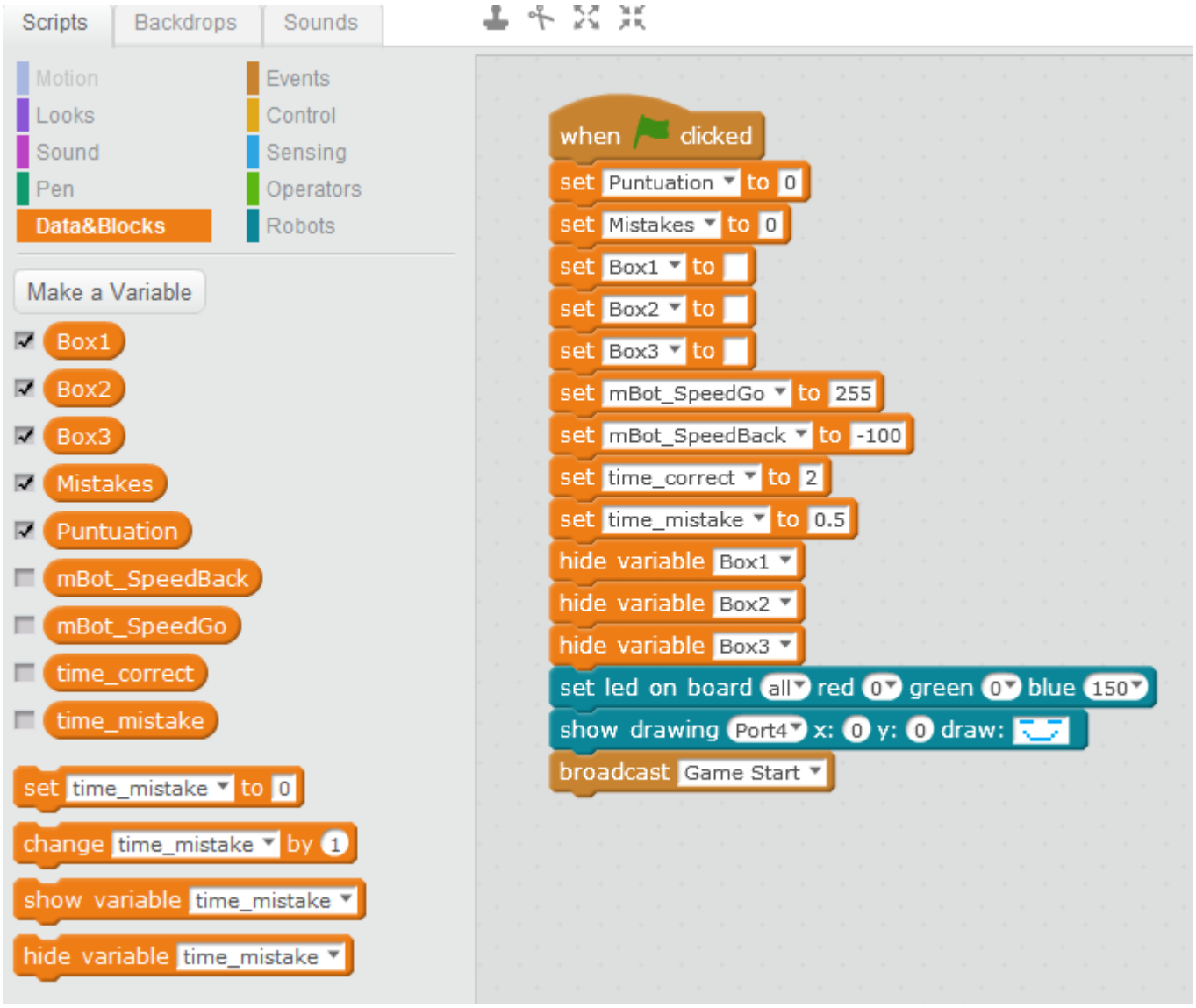


Now, we start to program the game code. First, select the background and the sprite that we want to display in the game:

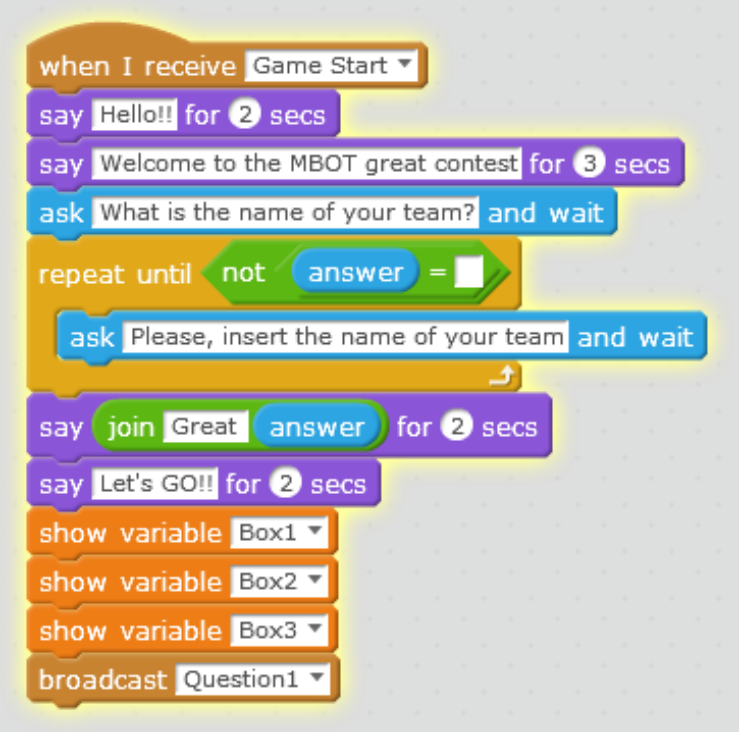



Scripts
Costumes
Sounds
New costume:
boy1-a
Clear
Import
1
boy1-a
89x191
2
STEMJAM L...
108x54
3
Favicon
132x130
4
boy1-a2
89x191
200%
Vector Mode
Convert to bitmap

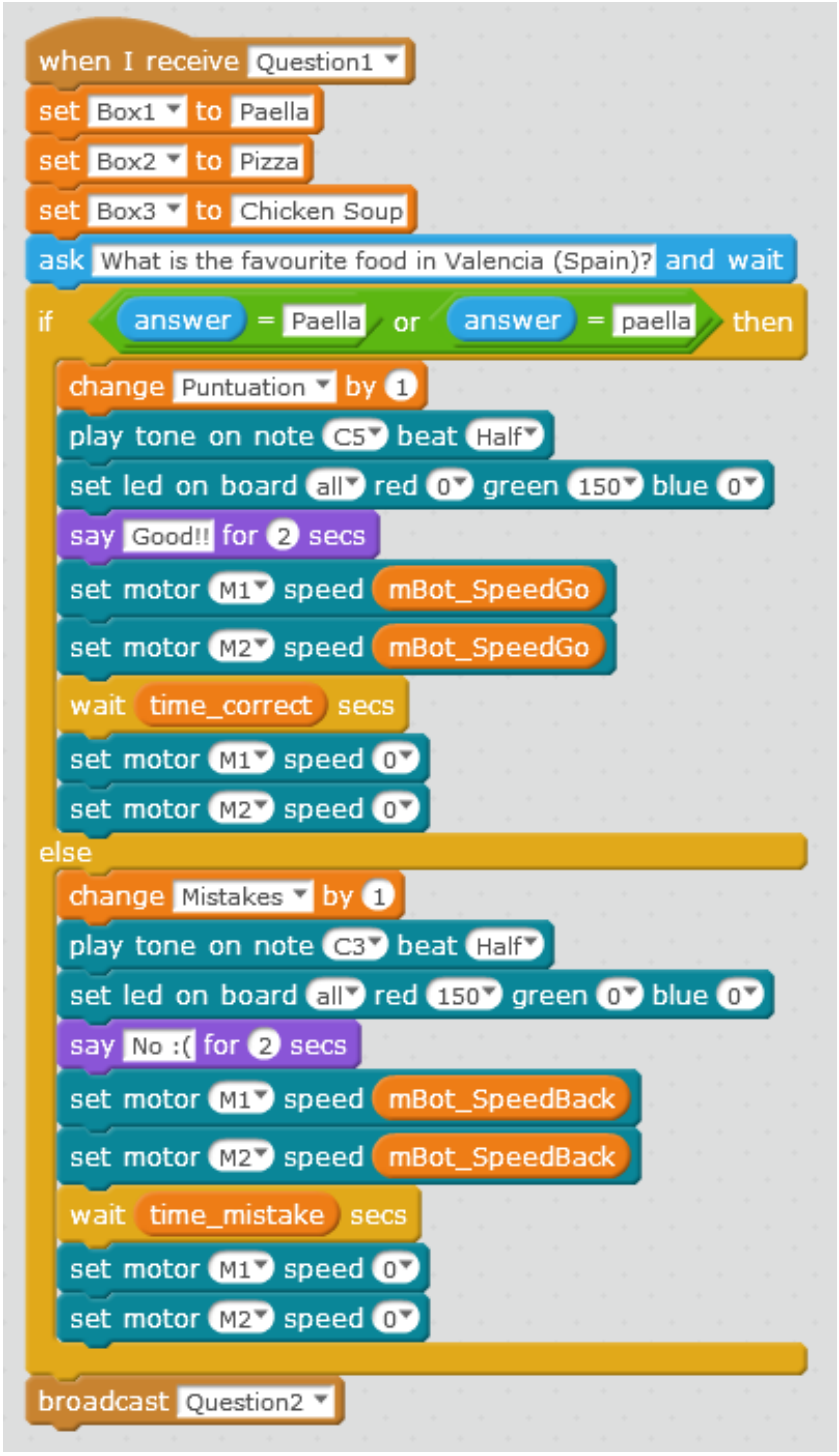
Then, we initialize the variables:



The next step is program the welcome to the game:



We establish the questions, the different options and what will happen if it is correct or wrong:



The answers options will display in option's boxes and our sprite ask the question.

If user answer correct, it adquires one point, and mBot run forward during 3 seconds. In the other case, if user answer wrong, it adquires one mistake and mBot run backward during 0.5 seconds.

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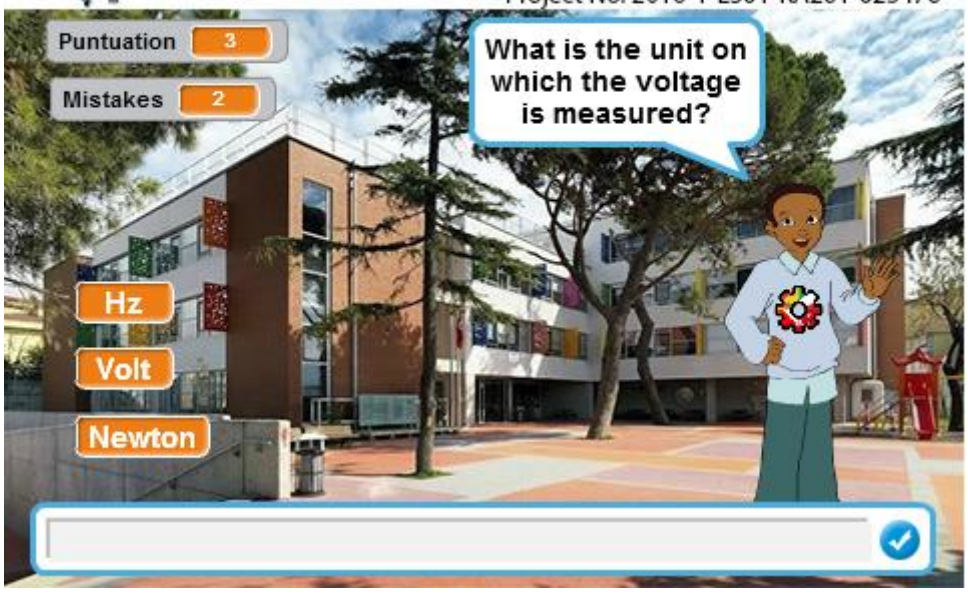
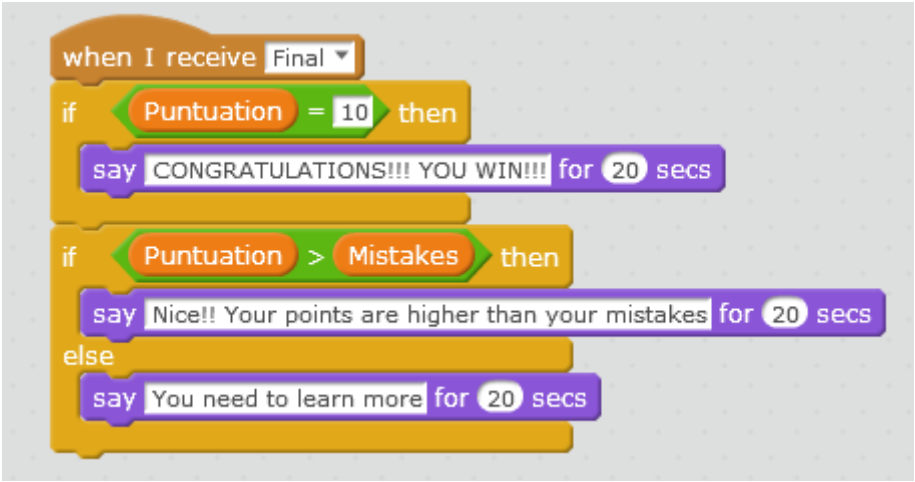


If the user has answered all the questions in the correct way, a message of “CONGRATULATIONS!!! YOU WIN!!!”. If the puntuation is higher than mistakes, will display “Nice!! Your points are higher than your mistakes”. In other case, “You need to learn more” message will appear.



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Once we have programmed the game, we must match a mBot to a computer, and the other mBot to the other computer.

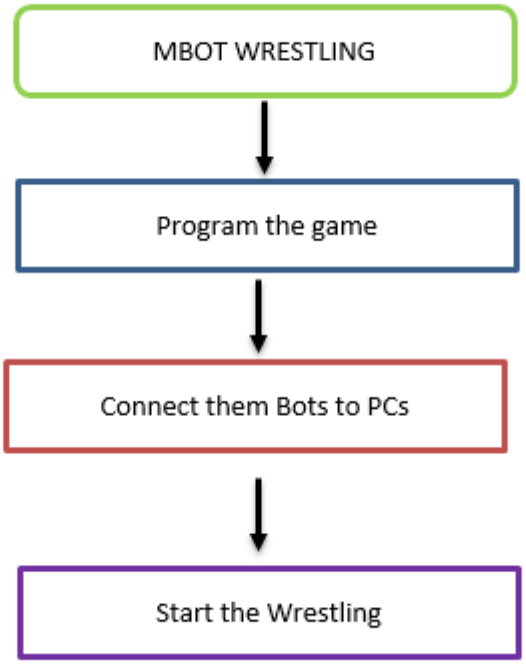
Also, with a rope, match one mBot with the other.

Once we have it .....**May the best win**!

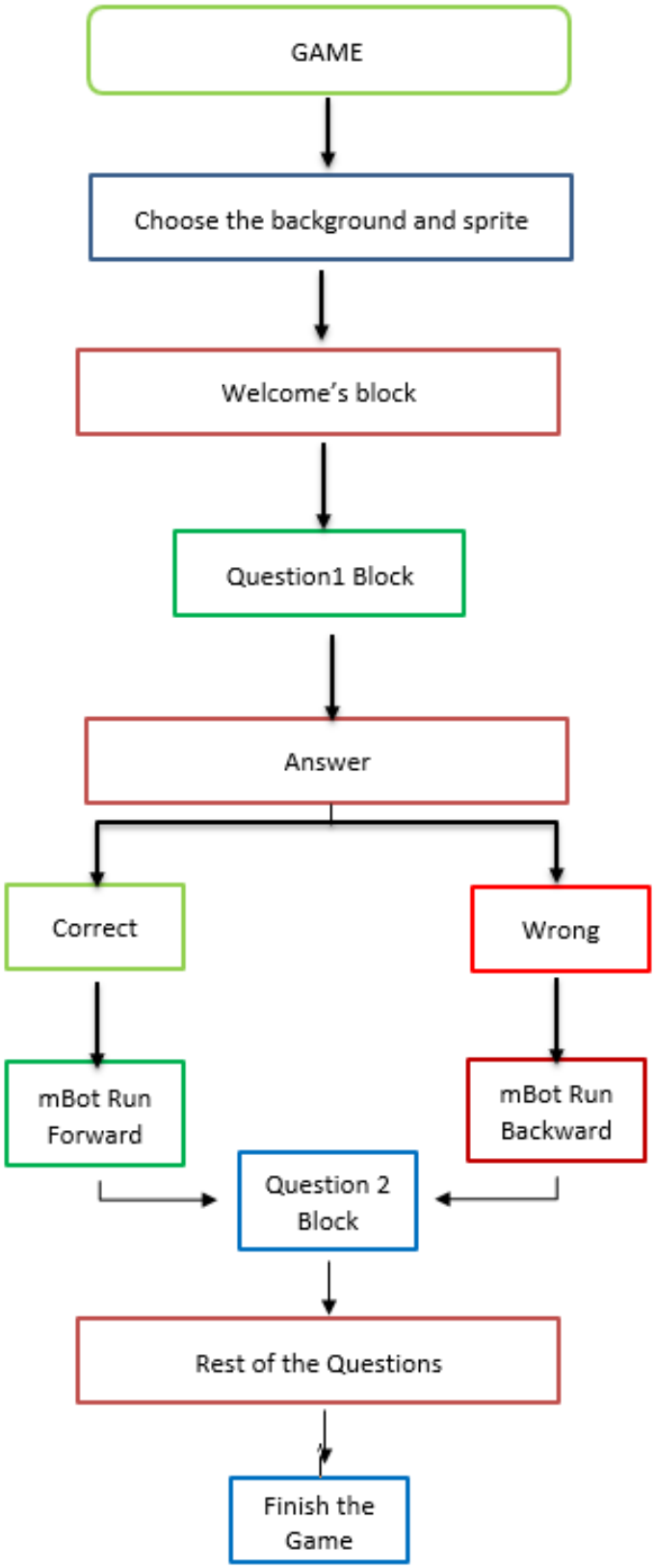

Puntuation 10
Mistakes 0
Congratulations!!!
YOU WIN!!!
Congratulations You win!

Second version

Schema of this activity:



Schema of game:



STUDENT'S EVALUATION

20 Stemjam team members participated in this project.

Project was completed in one week.

All students in the project are willing and excited.

BIBLIOGRAPHY

https://scratch.mit.edu/explore/projects/all

MORE INFORMATION

The game interface and the code is explain more detailed in "Developing videogames with Scratch" presentation.