

SCENARIO

Title	OCEAN CLEANER
Summary	During this exercise, the student will learn to synchronize elements, switch between platforms according to the device, record score, lives.
Author/s	AIJU

DIDACTIC OBJECTIVES

- Teach basics of coding by block with SCRATCH
- Learning about lives, scores, and multi-platforms.

Music **X** Mathematics Information Technology **X** Robotics Programming **X**

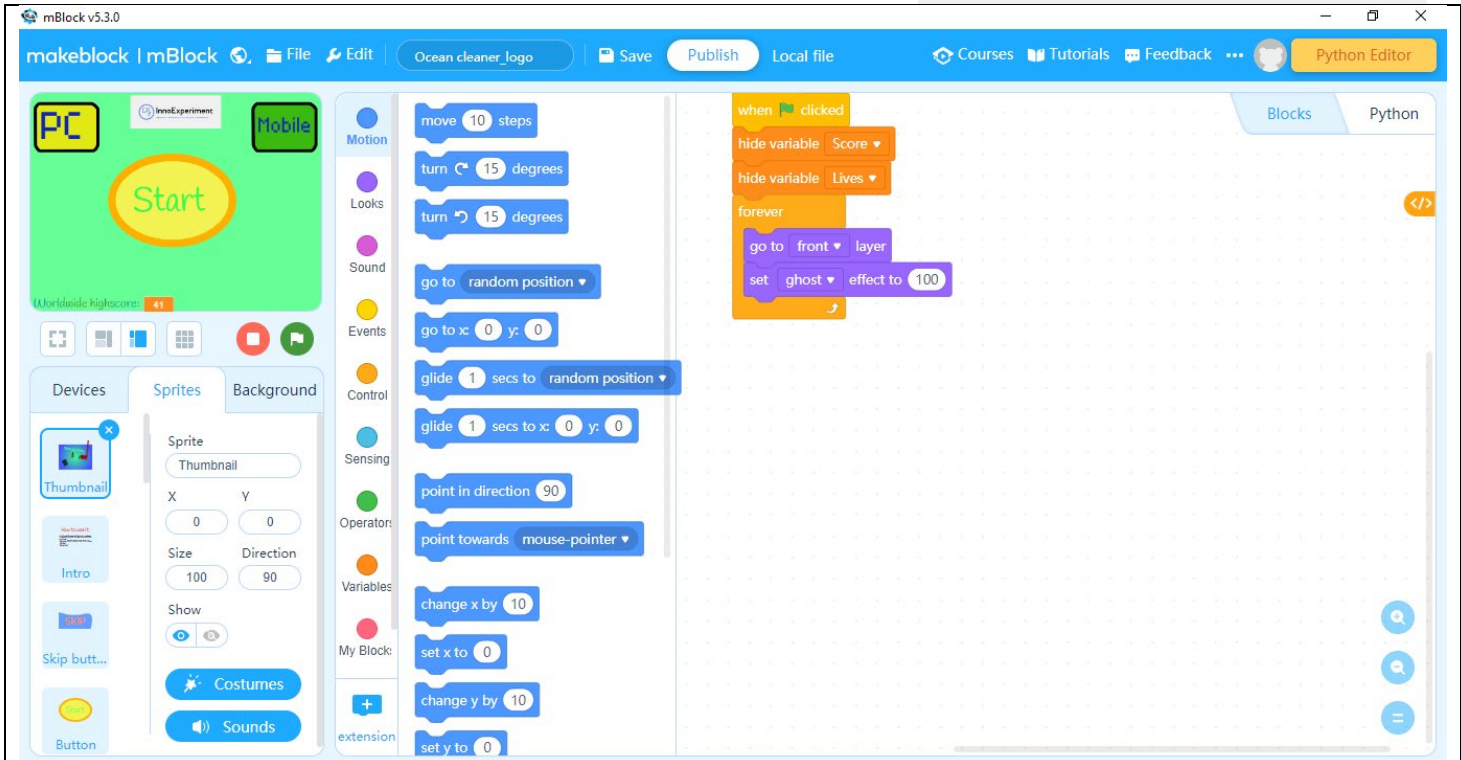
Education Level: 10-12 years 12-14 years **X**

PROBLEM STATEMENT

Begin to teach programming to students through simple block language and image assignment. In a simple way, students begin to understand concepts such as variables, assignments, conditionals.

BOM (Bill Of Materials needed)

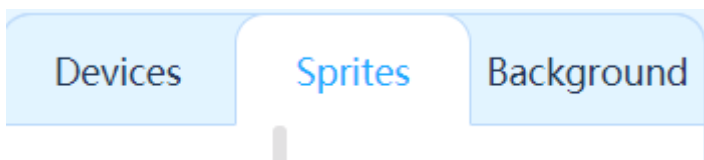
- SCRATCH
- Assets from SCRATH software



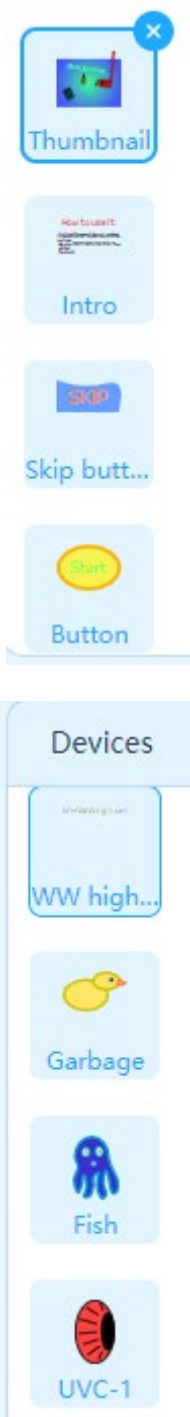
ACTIVITY DESCRIPTION

The objective of the activity is to develop a game in which we will receive an email in which they tell us a task that we must do, we have to clean the ocean with a machine that absorbs all the garbage. We will select whether we are on a pc or mobile. Once inside we are going to clean all the garbage without absorbing the fish since they take your lives and you lose.

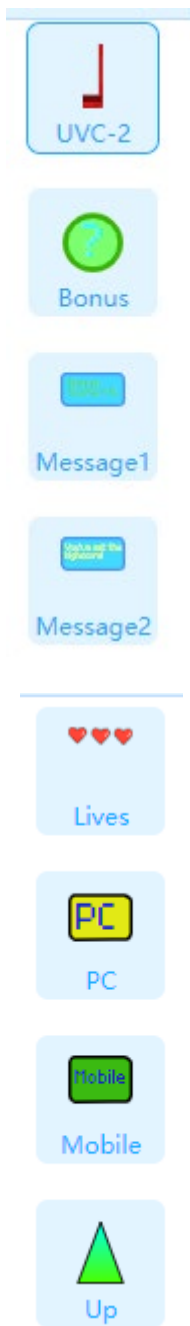
First, we need to create scene, go for Sprites and find assets:



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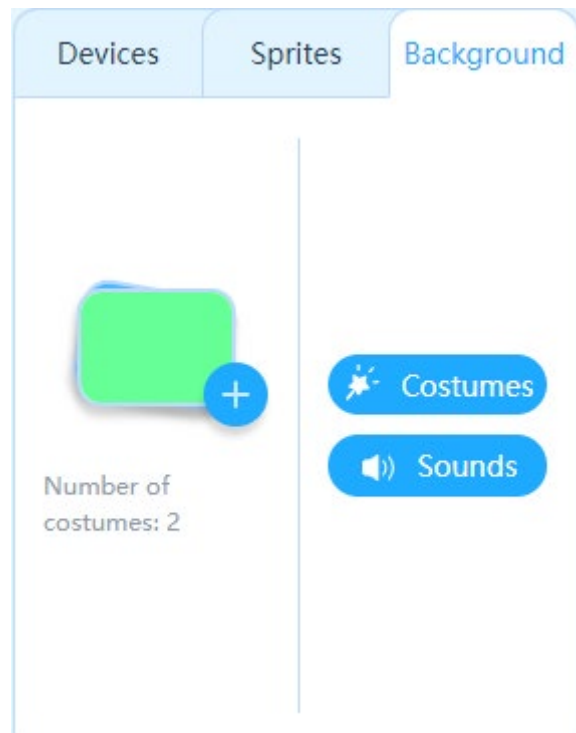
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And background:



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Erasmus+



InnoExperiment

INNOVATIVE APPROACH TO TEACHING THROUGH EXPERIMENT

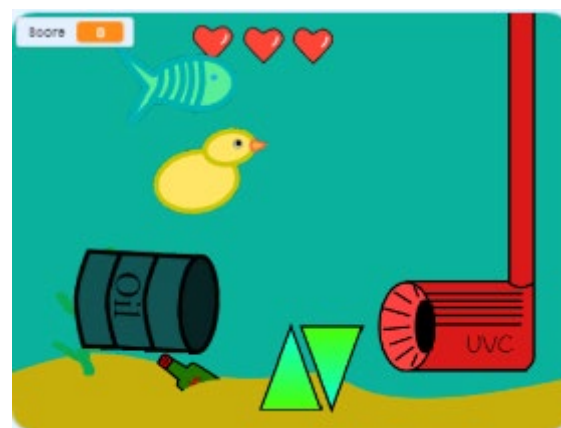


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Create visual scene:



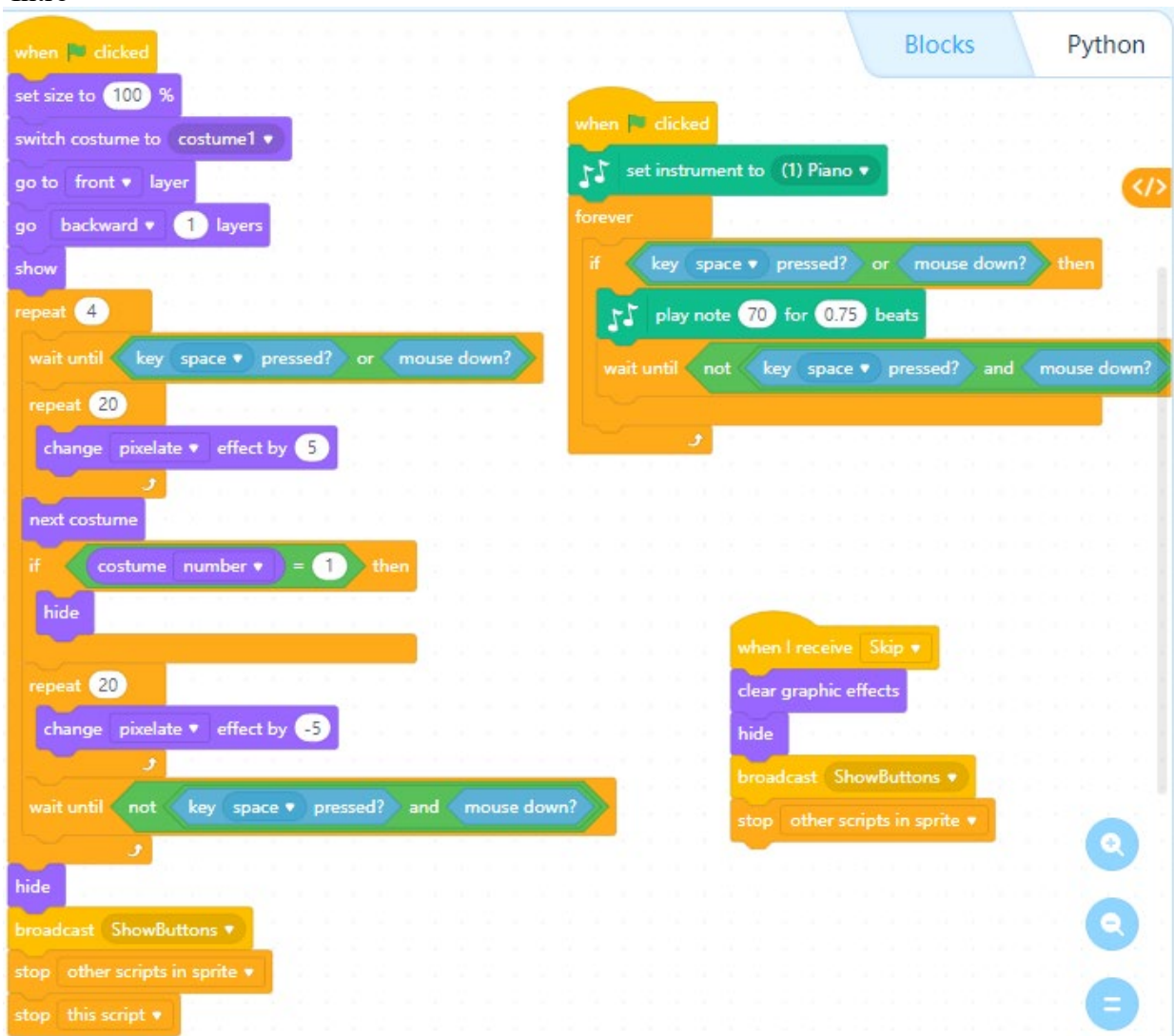
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Add coding for each assets:

Thumbnail

```
when clicked
hide variable Score
hide variable Lives
forever
go to front layer
set ghost effect to 100
```

Intro



```
when clicked
set size to 100 %
switch costume to costume1
go to front layer
go backward 1 layers
show
repeat 4
wait until key space pressed? or mouse down?
repeat 20
change pixelate effect by 5
next costume
if costume number = 1 then
hide
repeat 20
change pixelate effect by -5
wait until not key space pressed? and mouse down?
hide
broadcast ShowButtons
stop other scripts in sprite
stop this script

when clicked
set instrument to (1) Piano
forever
if key space pressed? or mouse down? then
play note 70 for 0.75 beats
wait until not key space pressed? and mouse down?

when I receive Skip
clear graphic effects
hide
broadcast ShowButtons
stop other scripts in sprite
```

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Skip button:

```

when clicked
  go to front layer
  show
  forever
    if touching mouse-pointer ? then
      set color effect to 30
      if mouse down? then
        broadcast Skip
      else
        set color effect to 0
  when I receive ShowButtons
    hide
    stop other scripts in sprite
  
```

Button:

```

when I receive ShowButtons
  show variable Worldwide highscore
  hide variable Score
  show
  set size to 100 %
  go to front layer
  forever
    if touching mouse-pointer ? then
      repeat 3
        change size by 5
      wait until not touching mouse-pointer ?
      repeat 3
        change size by -5
    when this sprite clicked
      go to x: 0 y: 0
      hide
      when this sprite clicked
        repeat 12
          change size by 20
        hide
        broadcast Start game
        wait 1 seconds
        stop other scripts in sprite
        stop this script
    when this sprite clicked
      set instrument to (4) Guitar
      play note 67 for 0.25 beats
      play note 65 for 0.25 beats
      rest for 0.25 beats
      play note 72 for 0.25 beats
  
```

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WW highscore:

```

when clicked
hide

when I receive ShowButtons
go to x: -160 y: -170
show

when I receive Start game
hide
    
```

Garbage:

```

when clicked
hide variable Stop_Game?
hide variable Score
hide variable Worldwide highscore
hide

when I receive Start game
set Stop_Game? to 0
hide variable Worldwide highscore
show variable Score
set Score to 0
forever
create clone of myself
wait pick random 1 to 3.5 seconds

when I receive Start game
set Hardness to 1
forever
wait 8 seconds
change Hardness by 1

when I receive Stop game
set Stop_Game? to 1
    
```

Let the garbage and the fish move faster every 8 seconds.

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```
when I start as a clone
set x to -150
set y to pick random -90 to 125
point in direction pick random 0 to 359
go to front layer
switch costume to pick random 1 to 6
set size to 100 %
show
forever
if Stop_Game? = 0 then
change x by Hardness
if pick random 1 to 50 = 1 then
if pick random 1 to 10 = 1 then
turn pick random 1 to 150 degrees
else
turn pick random 1 to 150 degrees
if touching edge ? then
delete this clone
if distance to UVC-1 < 50 then
point towards UVC-1
stop all sounds
```

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```
start sound recording1
repeat 4
  move 2 steps
  change size by -8
change Score by 1
delete this clone

if Score > Worldwide highscore then
  set Worldwide highscore to Score
  broadcast Set_highscore
else
  stop other scripts in sprite
  delete this clone
```

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Fish:

```

when clicked
  hide variable Lives
  hide

when I receive Start game
  set Lives to 3
  forever
    create clone of myself
    wait pick random 1 to Frequency_of_fish_appearance seconds

when I receive Start game
  forever
    if 6 > Hardness then
      set Frequency_of_fish_appearance to 6 - Hardness

when I start as a clone
  set x to -150
  set y to pick random -90 to 125
  point in direction pick random 75 to 115
  go to front layer
  switch costume to pick random 1 to 5
  set size to 100%
  show
  forever
    if not Lives = 0 then
      change x by Hardness
      if touching edge? then
        delete this clone
      if distance to LVC-1 < 50 then
        point towards LVC-1
        stop all sounds
        start sound recording1
        repeat 4
          move 2 steps
          change size by -8
        if Score > 0 then
          change Score by -1
          change Lives by -1
          delete this clone
        else
          broadcast Stop game
          broadcast ShowButtons
          stop other scripts in sprite
          delete this clone
  
```

I don't know if this works, but maybe...





UVC-1:

```

when I receive Up
  change y by 5

when clicked
  hide

when I receive Start game
  go to x: 100 y: -90
  set MaxY to -90
  show
  forever
    if key up arrow pressed? then
      broadcast Up
    if key down arrow pressed? then
      broadcast Down

when I receive Stop game
  hide
  stop other scripts in sprite
  
```

UVC-2:

```

when I receive Down
  if y position > MaxY then
    change y by -5

when clicked
  hide

when I receive Start game
  go to x: 100 y: 50
  set MaxY to 50
  show

when I receive Up
  change y by 5

forever
  if key up arrow pressed? then
    change y by 5
  if key down arrow pressed? and y position > MaxY then
    change y by -5

when I receive Stop game
  hide
  stop other scripts in sprite
  
```

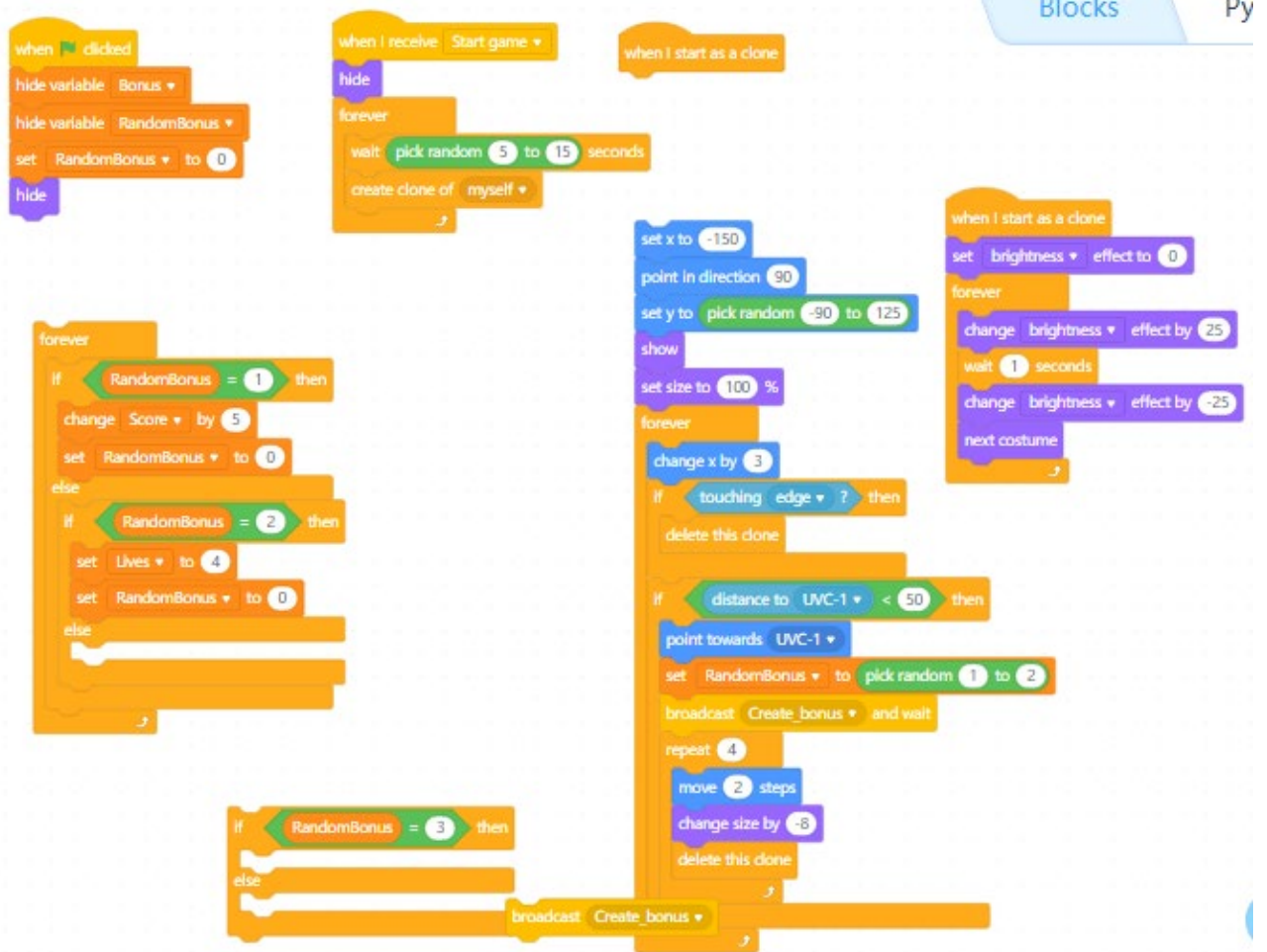
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Bonus:

Blocks Py



The image shows a collection of Scratch code blocks for a game. The blocks are organized into several functional groups:

- Initialization:**
 - When clicked: hide variable Bonus, hide variable RandomBonus, set RandomBonus to 0, hide.
 - When I receive Start game: hide, forever loop containing wait pick random 5 to 15 seconds, create clone of myself.
 - When I start as a clone: set x to -150, point in direction 90, set y to pick random -90 to 125, show, set size to 100%, forever loop containing change x by 3, if touching edge? then delete this done, if distance to UVC-1 < 50 then point towards UVC-1, set RandomBonus to pick random 1 to 2, broadcast Create_bonus and wait, repeat 4 times (move 2 steps, change size by -8, delete this done).
- Game Logic:**
 - When I start as a clone: set brightness effect to 0, forever loop containing change brightness effect by 25, wait 1 seconds, change brightness effect by -25, next costume.
 - Forever loop:
 - If RandomBonus = 1 then: change Score by 5, set RandomBonus to 0.
 - Else: If RandomBonus = 2 then: set Lives to 4, set RandomBonus to 0.
 - If RandomBonus = 3 then: broadcast Create_bonus.

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Message 1:

```

when clicked
  hide
  forever
  
```

```

if RandomBonus = 1 then
else
  if RandomBonus = 2 then
  else
  
```

```

when I receive Create bonus
  if RandomBonus = 0 then
    hide
  else
    if RandomBonus = 1 then
      change Score by 5
      set RandomBonus to 0
      switch costume to bonus1
      show
      wait 4 seconds
      hide
    else
      if RandomBonus = 2 then
        set Lives to 4
        set RandomBonus to 0
        switch costume to bonus2
        show
        wait 4 seconds
        hide
      else
        if then
        else
        
```

Message 2:

```

when clicked
  hide
  
```

```

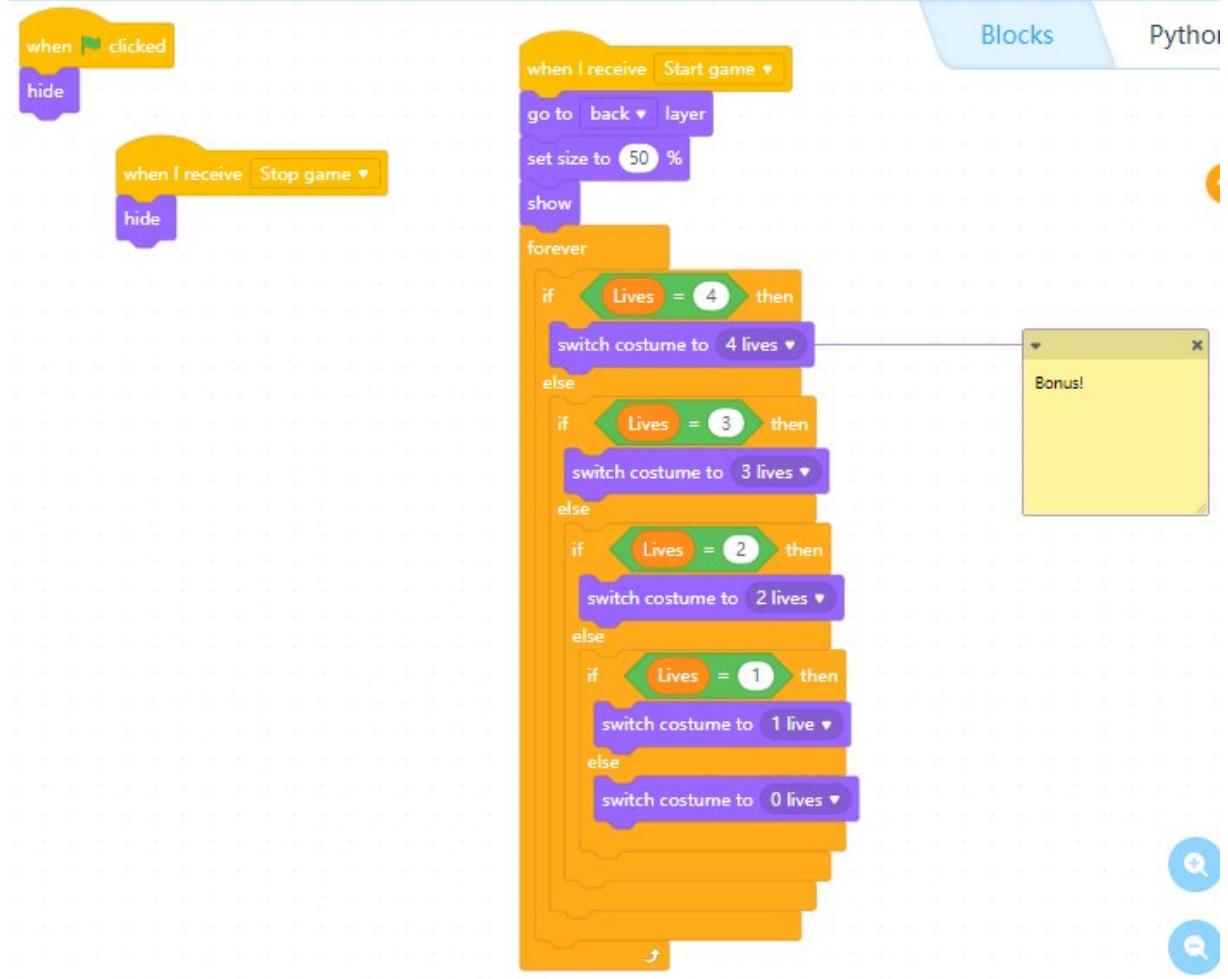
when I receive Set_highscore
  go to x: 30 y: -150
  show
  
```

```

when I receive Stop game
  hide
  
```

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Lives:



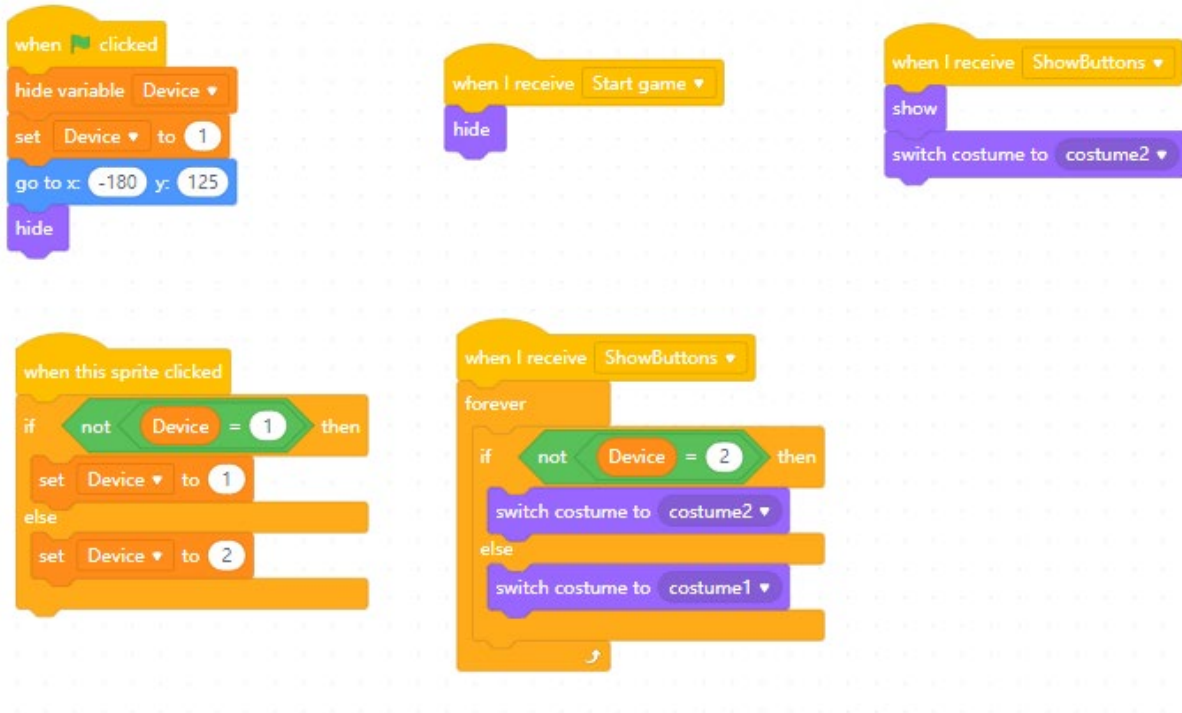
The image shows a Scratch code editor with a script for 'Lives'. The script is as follows:

- when I receive Start game ▾
 - go to back ▾ layer
 - set size to 50 %
 - show
 - forever
 - if Lives = 4 then
 - switch costume to 4 lives ▾
 - else
 - if Lives = 3 then
 - switch costume to 3 lives ▾
 - else
 - if Lives = 2 then
 - switch costume to 2 lives ▾
 - else
 - if Lives = 1 then
 - switch costume to 1 live ▾
 - else
 - switch costume to 0 lives ▾

A message box titled 'Bonus!' is visible on the right side of the editor.

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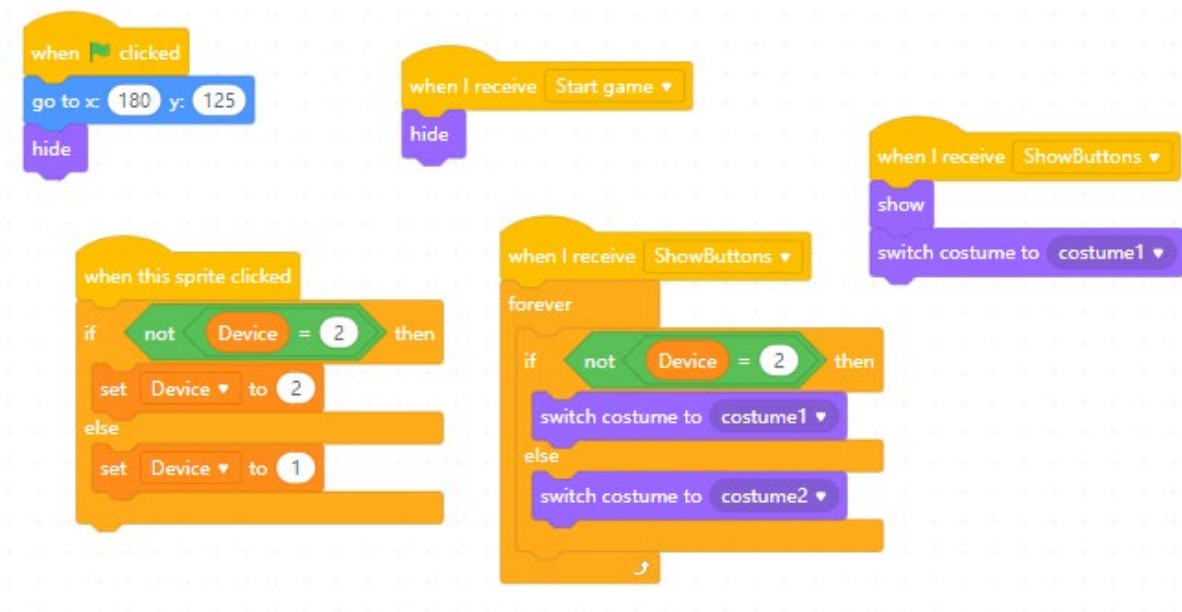
PC:



The PC version code consists of the following blocks:

- when clicked:** hide variable Device, set Device to 1, go to x: -180 y: 125, hide.
- when I receive Start game:** hide.
- when I receive ShowButtons:** show, switch costume to costume2.
- when this sprite clicked:** if not Device = 1 then set Device to 1 else set Device to 2.
- when I receive ShowButtons (forever loop):** if not Device = 2 then switch costume to costume2 else switch costume to costume1.

Mobile:



The Mobile version code consists of the following blocks:

- when clicked:** go to x: 180 y: 125, hide.
- when I receive Start game:** hide.
- when I receive ShowButtons:** show, switch costume to costume1.
- when this sprite clicked:** if not Device = 2 then set Device to 2 else set Device to 1.
- when I receive ShowButtons (forever loop):** if not Device = 2 then switch costume to costume1 else switch costume to costume2.

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Up:

```

when I receive Start game
  forever
    if touching mouse-pointer ? and mouse down? then
      broadcast Up
  
```

```

when I receive Start game
  go to x: 0 y: -90
  go to front layer
  if Device = 2 then
    show
  else
    hide
  
```

```

when clicked
  hide
  
```

```

when I receive ShowButtons
  hide
  
```

Down:

```

when I receive Start game
  go to x: 35 y: -90
  go to front layer
  if Device = 2 then
    show
  else
    hide
  
```

```

when I receive Start game
  forever
    if touching mouse-pointer ? and mouse down? then
      broadcast Down
  
```

```

when clicked
  hide
  
```

```

when I receive ShowButtons
  hide
  
```

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STUDENTS' EVALUATION

The way to evaluate the students would be for them to demonstrate on paper how they have developed the exercise and to use the program / game to check the solutions.

SCALABILITY

Regarding the concept of scalability, the complexity could be increased by adding more garbage, fish and decreasing lives.

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