

PROJECT BOOKLET FOR CODING CURRICULUM

GRADE VIII

Volume 1.0



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DISPLAYING IF A NUMBER IS ODD OR EVEN USING MINECRAFT

Chapter: Conditionals in Details.

This activity will help you determine if a number is odd or even with the help of Minecraft.

Problem Statement: You have learned about finding whether a number is odd or even in Mathematics. This can be done using a computer program also. Consider you have been given a number. You need to determine whether the number is odd or even using a computer program. Can you write a program for the same using python in Minecraft?

Learning Outcome: At the end of this exercise, you will learn:

- How to translate the mathematical concept of determining a number as odd or even into a computer program using a step-by-step approach.
- How to use IF ELSE condition within a program in Minecraft.

Solution: You should try this exercise on the Minecraft Education Edition. You may set up the Minecraft education edition from <https://education.minecraft.net/get-started>.

At the end of this activity, you can expect following output on screen:

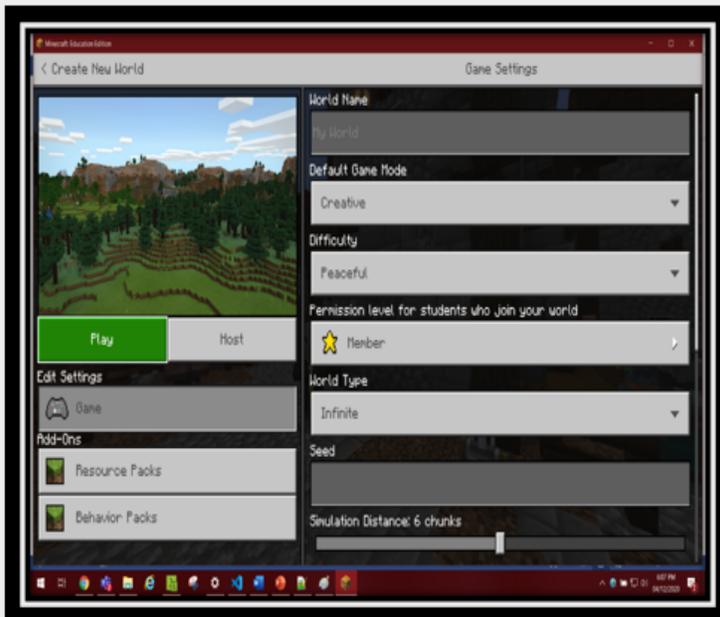


Let us now follow below steps to replicate this output on screen:



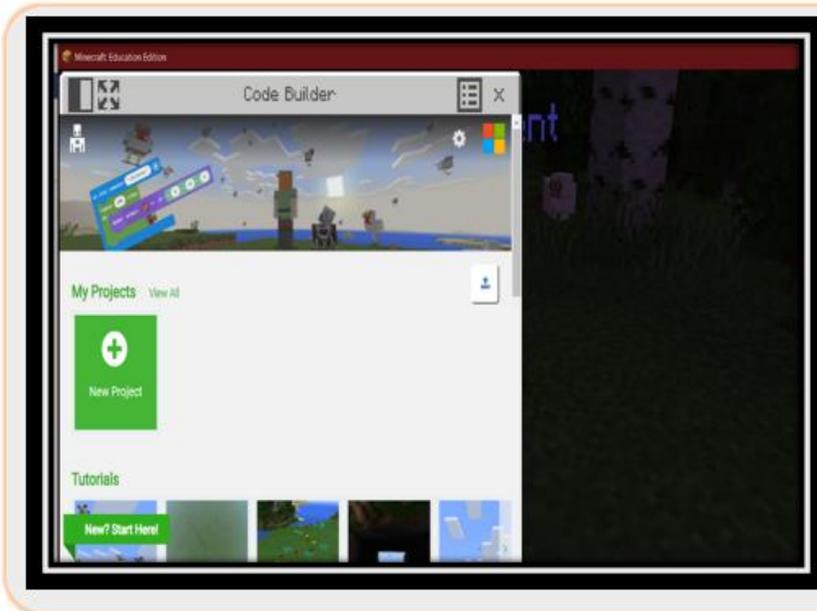
Minecraft Code Editor

Open Minecraft Education Edition application, login and click on **Play** button



A new screen will appear, Click on **Create New** button as highlighted below, and from options make sure to click on **New** option. This will take to the **Create New World** screen. In this screen you will get to create new Minecraft world for yourself.

From the Create New World screen, make sure to choose Default Game Mode option as Creative. When you are done with that, click on the big Play button



Press Key **C** to bring up code editor. A screen will pop up asking you to create new project. Click on **New Project** button, give it a name.



You will arrive to the Minecraft world that you have created

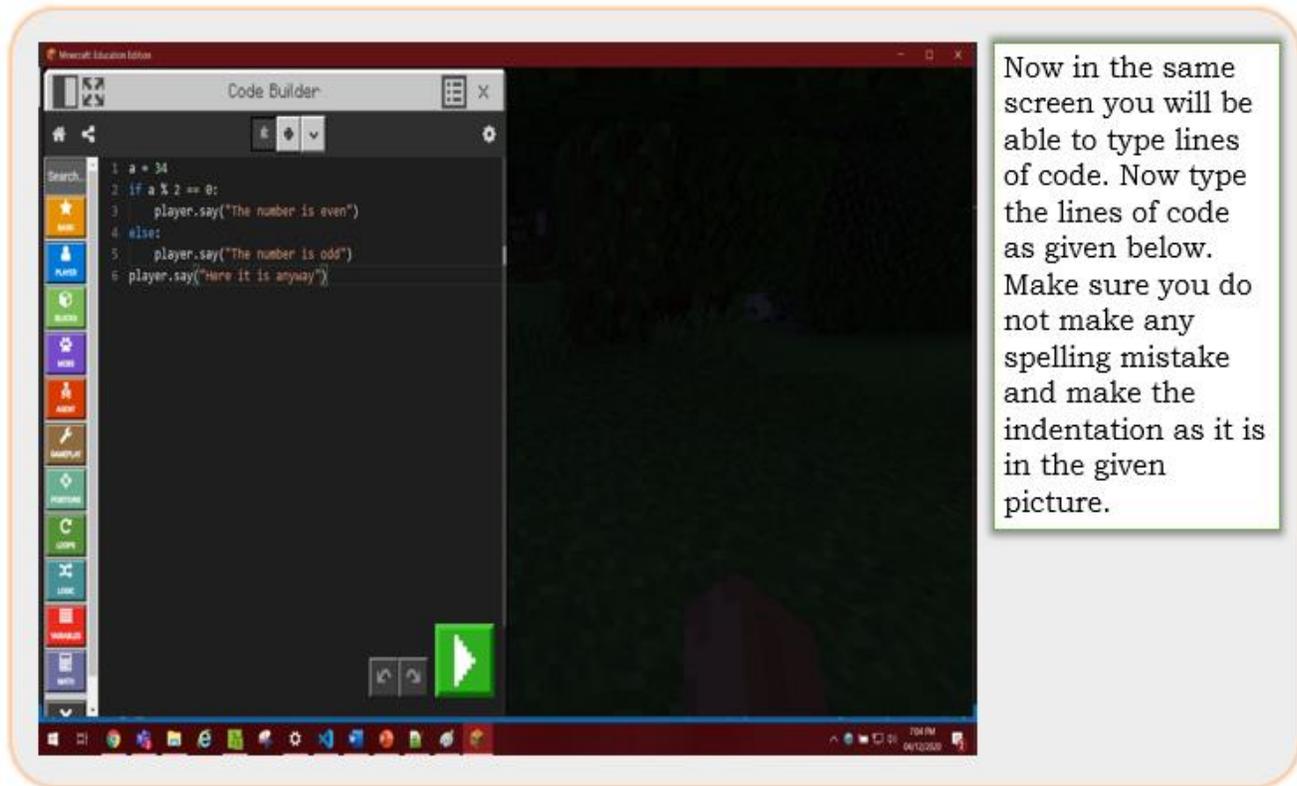


Press **Key C** to bring up the code editor



From code editor click on the highlighted dropdown button and select the option **Python**. You might see some code, make sure to clear all that

Now we will implement the example of odd-even to display some messages on the



screen.

The program that you have written assigns 34 to a variable named as a. Then, in the next lines of code, it checks whether variable a is now divisible by 2. If it is divisible, we are displaying a message on the screen. At line 3, 5 and 6 the statement **player.say** is used for displaying the message in the screen.

When you are done with typing the necessary lines of code, click on the green **Start** button to execute the program. You will see the below result displaying number is even.





THE NESTED DIVISION PROBLEM

Chapter: Conditionals in Details.

To check if a number is divisible by 4 or 5 or both 4 and 5.

Problem Statement: In mathematics, you have learned about finding whether a given number n_1 is divisible by number n_2 or n_3 or both (n_2 and n_3). This can be done using a computer program also. Consider you have been given a number. You need to determine whether the number is divisible by 4 or 5 or both 4 and 5 using a computer program. Can you write a program for the same using python in Minecraft?

Learning Outcome: At the end of this exercise, you will learn:

- How to translate the mathematical concept of determining whether the number is divisible by 4 or 5 or both 4 and 5 into a computer program using a step-by-step approach.
- How to use nested IF ELSE condition within a program in Minecraft.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

Now that you have Minecraft Code Editor opened, type down the program as given below. Make sure the indentations are correct.

```
1 number = 44
2 if number % 4 == 0:
3     if number % 5 == 0:
4         player.say("The number is divisible by both 4 and 5")
5     else:
6         player.say("The number is divisible by 4 only")
7 elif number % 5 == 0:
8     if number % 4 == 0:
9         player.say("The number is divisible by both 5 and 4")
10    else:
11        player.say("The number is divisible by 5 only")
12 else:
13    player.say("The number is divisible by neither 5 nor 4")
```



After you are done with typing the code, click on the green **Start** button to execute the program.

Result:

You will now see that message is displayed according to the logic we have written in our program. It assigns 44 in a variable called **number**. Then it goes through our nested if-elif blocks to display the result. If you have typed the lines of code properly, clicking on **Start** button will display a message like below.



Now press C key to go back in the code editor. You can change the value of the variable and run it again. By doing that, you can verify if the program is behaving as you have expected.

CAT RAIN

Chapter: Get Creative With Loops.

To rain cats from the sky using Minecraft coding platform.

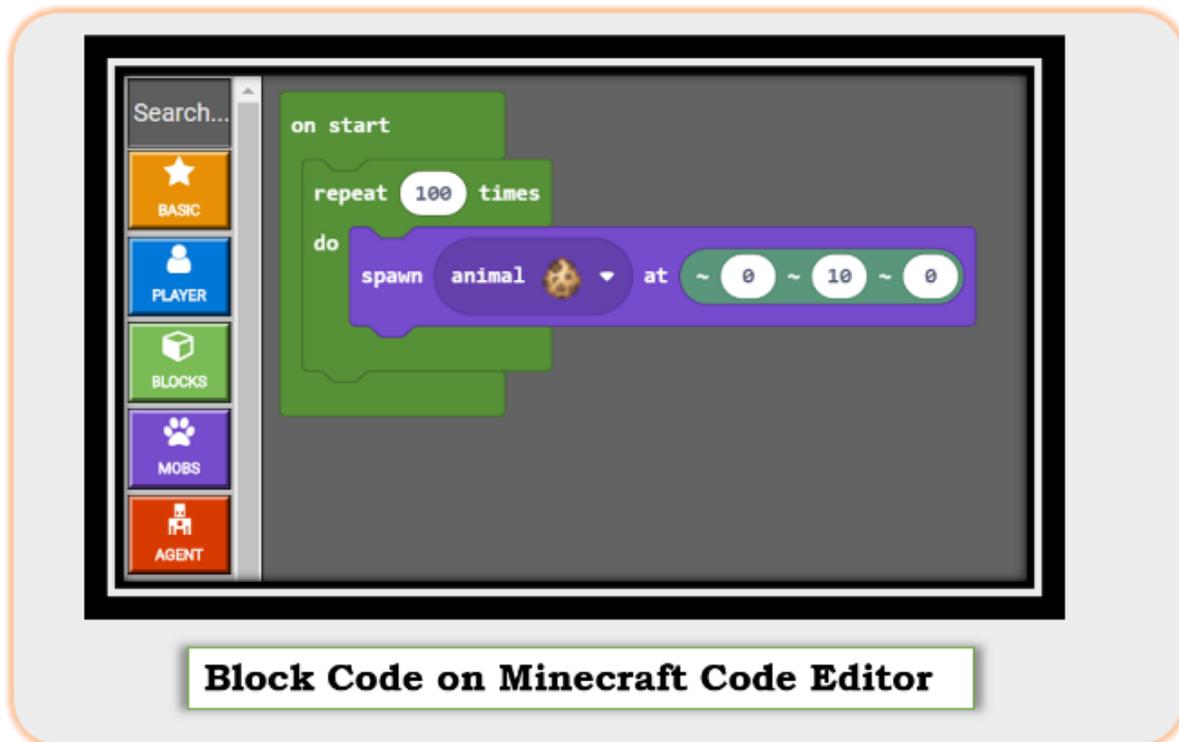
Problem Statement: When you use the term “Raining cats and dogs”, you mean to say that it is raining unbelievably hard. Similar concept can be replicated in a computer program, by raining cats from the sky in Minecraft. Can you write a program in Minecraft to rain cats from the sky?

Learning Outcome: At the end of this exercise, you will learn:

- How to create an animal object like cat in Minecraft.
- How to use FOR loop within a program in Minecraft to display raining cats.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

Below is how the exercise will look when implemented with block coding with Minecraft

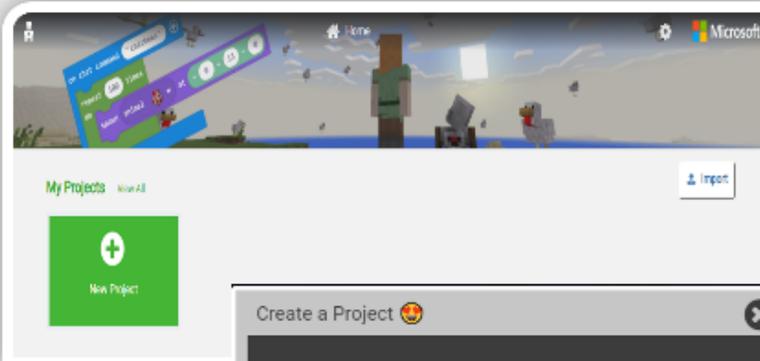


The final output of this exercise should look like as shown in the image below.



Final Output – Cat Rain Activity

However, in this exercise, we will try to implement the same code using python.



Creating New Project

You can create a new project by clicking on green box labeled as 'New Project'. A dialog box will appear prompting you to give a project name.

Giving Your Project A Name

You need to type down a name in the text and click on 'Create' button



Follow the below code block. We have used a for loop with range 100 – This means that the loop will run 100 times.

So, the line **mobs.spawn(CAT, pos(0, 10, 0))** will be executed 100 times.



Cat Rain



After you click on play 100 cats will rain from the sky.

CREATE A STAIRCASE USING FOR LOOP

Chapter: Get Creative With Loops.

To create a block of stairs with for loops using Minecraft coding platform.

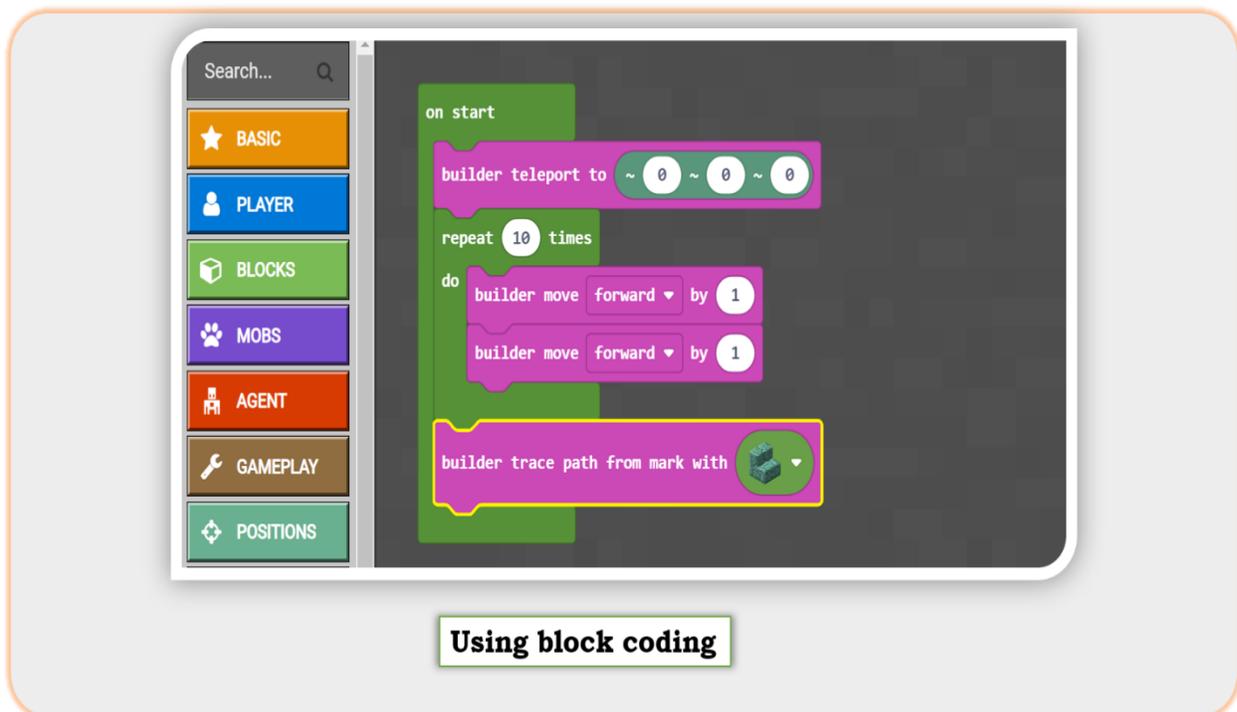
Problem Statement: When a block of stairs is created, two things need to be considered. First is the number of stairs present in the block of stairs. Second is that each staircase should be of identical dimension. This activity of building a block of stairs can be done using a computer program in Minecraft. Can you write a program in Minecraft to build a block of stairs using for loop.

Learning Outcome: At the end of this exercise, you will learn:

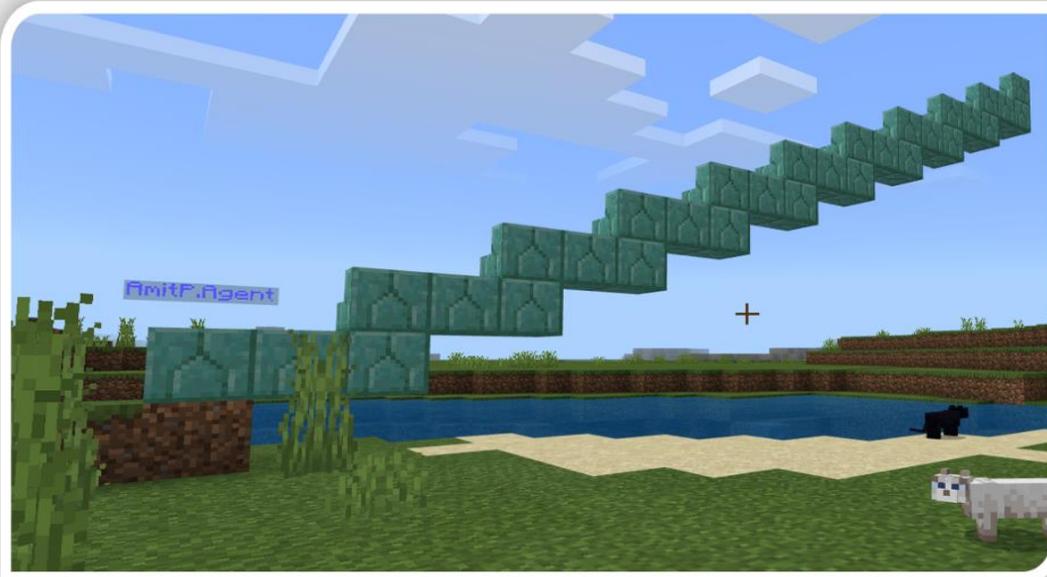
- How to use FOR loop within a program in Minecraft to build block of stairs.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

Below is how the code will look when implemented with block code using Minecraft education edition.



At the end of this exercise, the final output should look like shown in the below image.



Final Output - Create staircase using for loop activity

```
1 builder.teleport_to(pos(0, 0, 0))
2 for index in range(10):
3     builder.move(FORWARD, 2)
4     builder.move(UP, 1)
5 builder.trace_path(TUBE_CORAL_BLOCK)
```

Using python



So, we see how the same action is performed using a for loop. The detailed explanation of the previous code is given below:

Step 1: Teleporting the builder to the specified position

Step 2: Creating a for loop which will run 10 times

Step 3: Inside the for loop we will move the builder forward by 2 steps

Step 4: Move the builder up by 1

Step 5: Finally the builder traces the path travelled and puts a block on the position

Step 6: Click on play. You will see a flight of stairs of height 10 and having width of 3 blocks.

CREATE A STAIRCASE USING WHILE LOOP

Chapter: Get Creative With Loops.

To create a block of stairs with **while** loops using Minecraft coding platform.

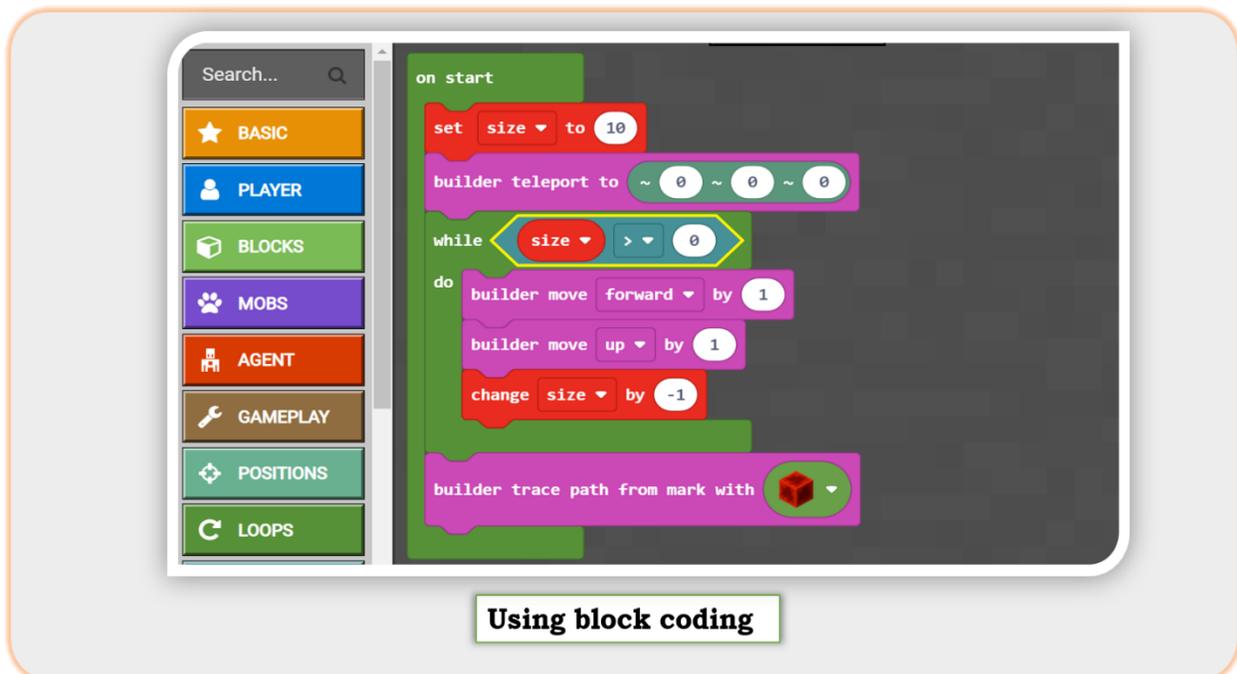
Problem Statement: When a block of stairs is created, two things need to be considered. First is the number of stairs present in the block of stairs. Second is that each staircase should be of identical dimension. This activity of building a block of stairs can be done using a computer program in Minecraft. Can you write a program in Minecraft to build a block of stairs using while loop.

Learning Outcome: At the end of this exercise, you will learn:

- How to use WHILE loop within a program in Minecraft to build block of stairs.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

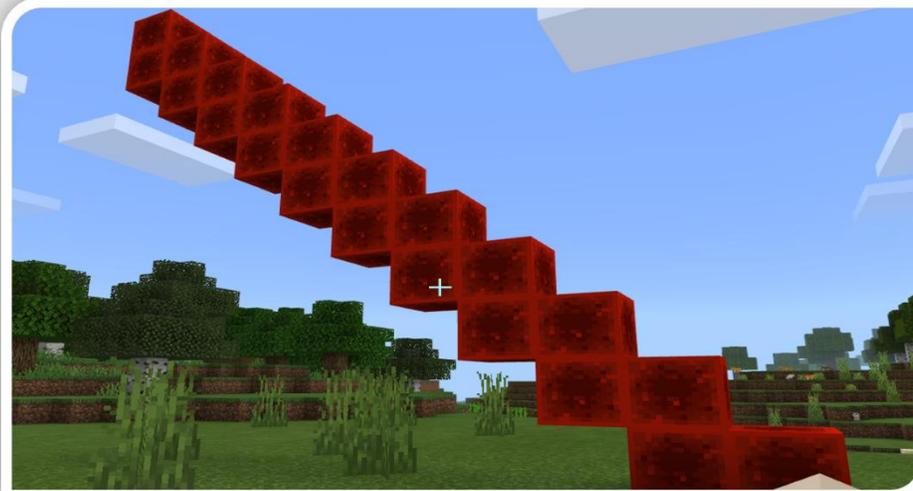
Below is how the code will look when implemented with block code using Minecraft education edition.



```
1 size = 10
2 builder.teleport_to(pos(0, 0, 0))
3 while size > 0:
4     builder.move(FORWARD, 1)
5     builder.move(UP, 1)
6     size += -1
7 builder.trace_path(REDSTONE_BLOCK)
```

Using Python

At the end of this activity, the final output should look like shown in the image below.



Final Output – Create staircase using while loop activity

Below are the detailed steps:



Step 1: Set the value of size variable to 10

Step 2: Teleport the builder to a specified position

Step 3: Create a while loop of size greater than zero

Step 4: Inside while loop move the builder forward by 1 step

Step 5: Next, move the builder up by 1 step

Step 6: Update the size variable by $size = size - 1$

Step 7: Finally, the builder traces the path travelled and puts a block on the position

Step 8: Finally run the code by clicking on play then on the chat window type step 10

Results: You will see a stair of height 10 formed in your Minecraft world

RAINING PIGS AND PANDAS

Chapter: Get Creative With Loops.

To create raining Pigs and Pandas with while loop using Minecraft coding platform.

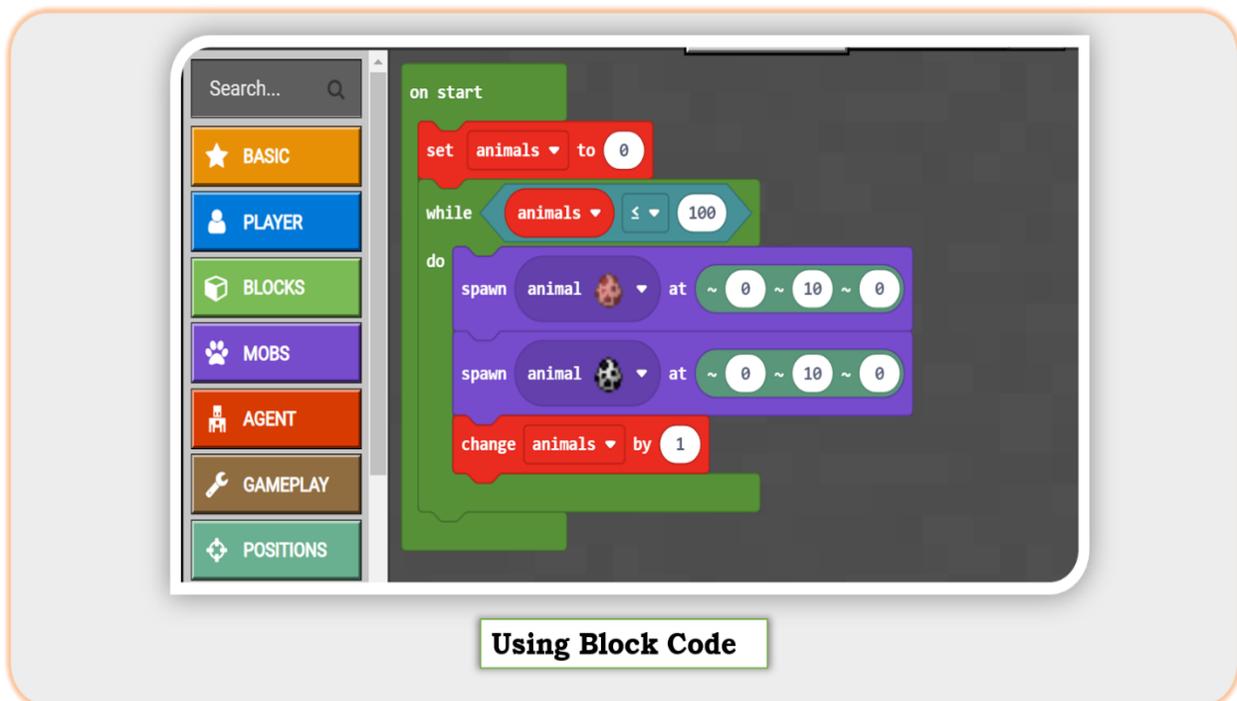
Problem Statement: When you use the term “Raining cats and dogs”, you mean to say that it is raining unbelievably hard. Similar concept can be replicated in a computer program, by raining pigs and pandas from the sky in Minecraft. Can you write a program in Minecraft to rain pigs and pandas from the sky using while loop?

Learning Outcome: At the end of this exercise, you will learn:

- How to create animal objects like pigs and pandas in Minecraft.
- How to use WHILE loop within a program in Minecraft to display raining pigs and pandas.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

Below is how the code will look when implemented with block code using Minecraft education edition.



And when done with Python, the code will look like below.

```
1 animals = 0
2 while animals <= 100:
3     mobs.spawn(PIG, pos(0, 10, 0))
4     mobs.spawn(PANDA, pos(0, 10, 0))
5     animals += 1
```

Using Python

At the end of this activity, the final output on screen should look like shown in the image below.



Final Output – Raining pigs and pandas activity

Below are the detailed steps:

Step 1: In the on start command, first set variable “animals” to 0.



Step 2: Now start a while loop which will run till the value of “animals” variable is less than or equal to 100.

Step 3: Inside while loop, set spawn of pigs to specified position.

Step 4: Inside while loop, set spawn of pandas to specified position.

Step 5: Lastly, update the value of variable “animals” to “animals = animals + 1”.

Step 6: Finally run the code by clicking on play then on the chat window type rain
100

Result: After you run the code you will see 100 pigs and 100 pandas dropping from the sky in your Minecraft Environment

CALCULATING VOLUME OF CUBOID

Chapter: Functions In Depth.

To calculate the volume of cube using Minecraft coding platform.

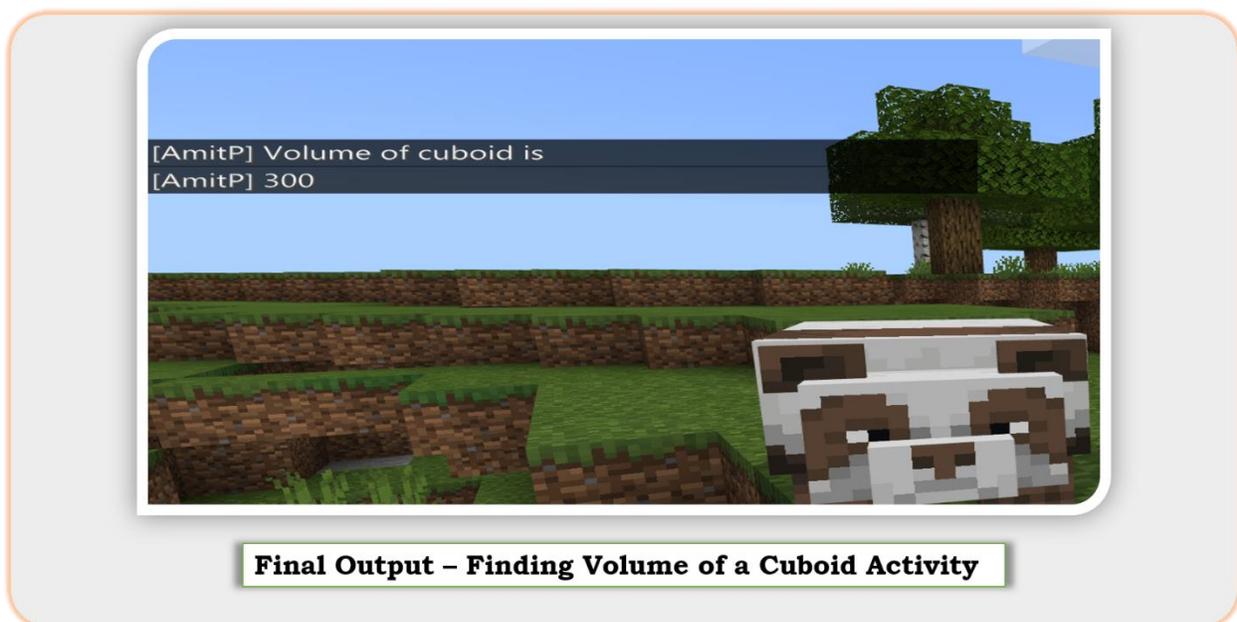
Problem Statement: In mathematics, you have learned about finding the volume of a cuboid with dimensions L, B & H. This can be done using a computer program also. Consider you have been given a cuboid with dimensions L, B & H. You need to determine the volume of the cuboid using a function within a computer program. Can you write a program for the same using python in Minecraft?

Learning Outcome: At the end of this exercise, you will learn:

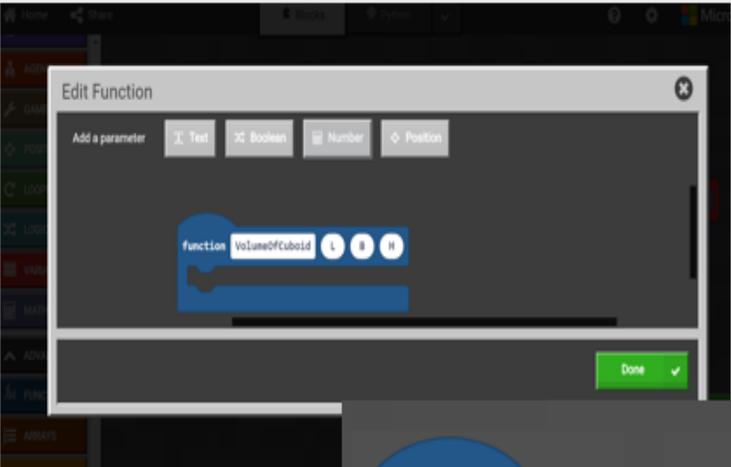
- How to use functions within a program in Minecraft to calculate and return volume of a cuboid.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

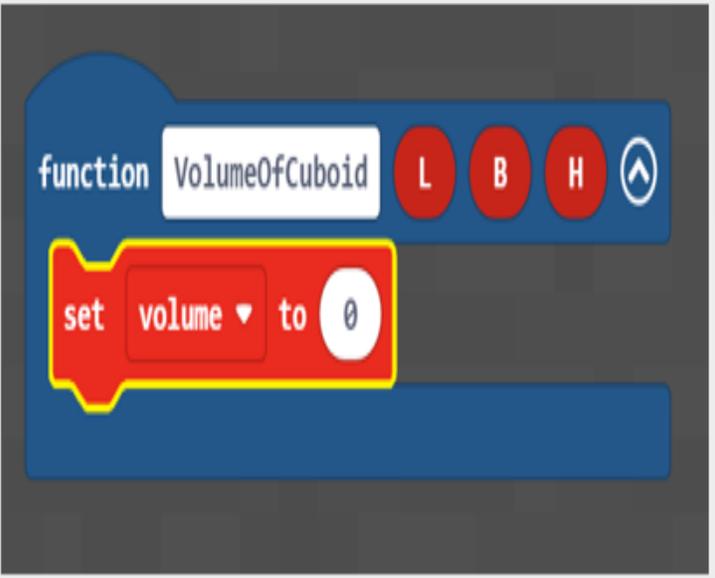
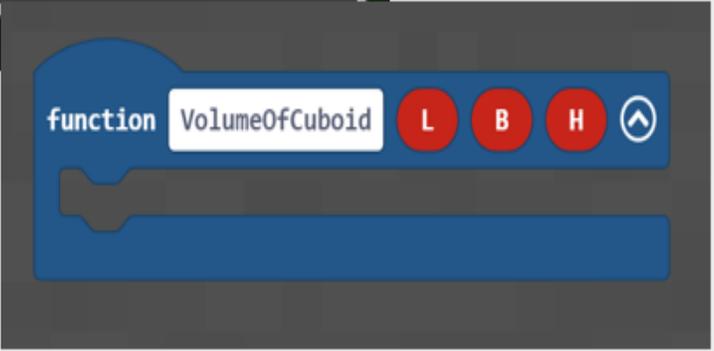
At the end of this exercise, the final output should look like shown in the screen below:



Let us now try to replicate this output on our screen by following the steps below:



Step 1: Create a new function named **VolumeOfCuboid** with three parameters.



Step 2: Create a variable named **volume** and set it to 0. Place this block within the function.



The screenshot shows the Scratch programming environment. On the left is a sidebar with categories: AGENT, GAMEPLAY, POSITIONS, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED. The 'MATH' category is selected, showing various math blocks like addition, subtraction, multiplication, and division. A tooltip for the multiplication block reads 'Return the product of the two numbers.' In the main workspace, a function block named 'VolumeOfCuboid' is visible. Inside this function, a 'set volume to' block is being edited, and a multiplication block is being placed into its input field. A text box on the right side of the workspace contains the instruction: 'Step 3: Select multiplication block from math operators and place it inside the function.'



function VolumeOfCuboid L B H

set volume to 0 x 0 x 0

Step 4: Add another multiplication block to multiply three numbers.

function VolumeOfCuboid L B H

set volume to L x B x H

say "Volume of cuboid is"

say volume

Step 5: Now add two 'Say' blocks to print the value of volume.



Step 6: Add an 'on start' block and call the function within 'on start' block.

Step 7: Click play to see the output.

FUN IN MINECRAFT USING ARRAYS

Chapter: Programming With Arrays.

To create an array of flowers and calculate the length of the array to create a flight of stairs. using Minecraft coding platform.

Problem Statement: Consider you have been asked to create an array which contains the name of different flowers. You then need to calculate the length of this array. Once you have the length of the array, you need to create a set of stairs having the same length as the array. Can you write a program same using python in Minecraft to implement the above steps?

Learning outcome: At the end of this exercise, you will learn:

- How to use create an array in Minecraft and determine its length.
- How to use a for loop to create a block of stairs in Minecraft having the same length as that of the array.

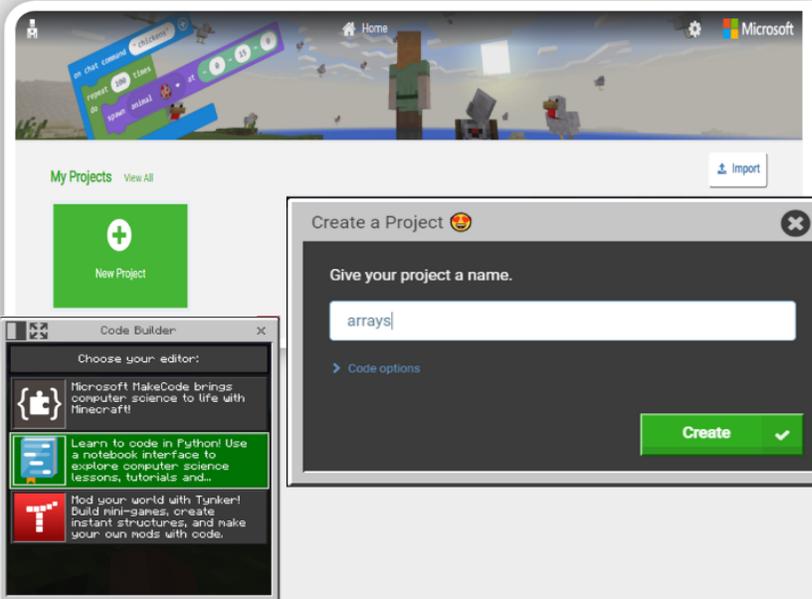
Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

At the end of this exercise, the final output on the screen should look like as shown in the below screenshot.



Final Output – Fun in Minecraft with arrays

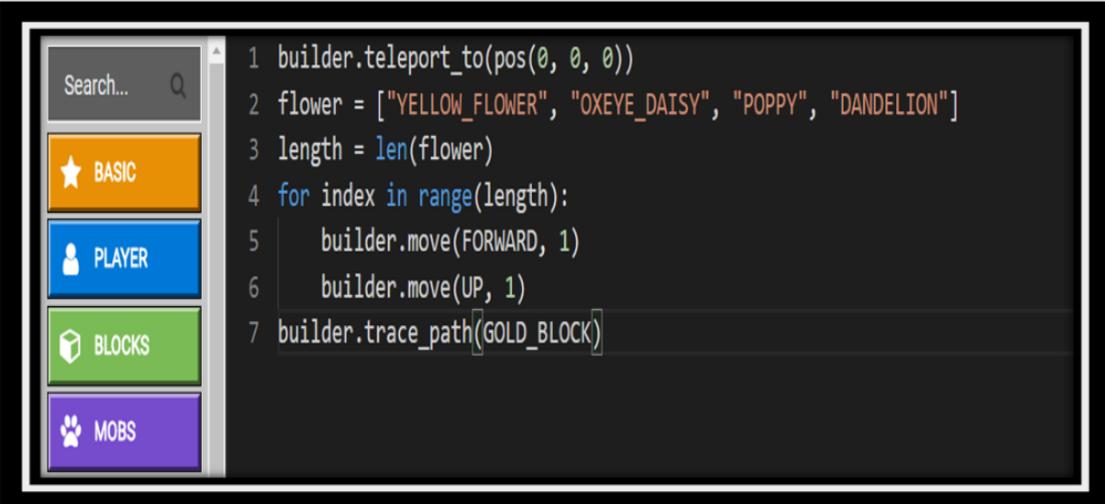
You should try this exercise on the Minecraft education edition.



Creating New Project
You can create a new project by clicking on green box labeled as 'New Project'. A dialog box will appear prompting you to give a project name.

Giving Your Project A Name
You need to type down a name in the text and click on 'Create' button. Select Python as the editor.

In this activity we will create an array of flowers and calculate the length of the array to create a flight of stairs.



```

1 builder.teleport_to(pos(0, 0, 0))
2 flower = ["YELLOW_FLOWER", "OXEYE_DAISY", "POPPY", "DANDELION"]
3 length = len(flower)
4 for index in range(length):
5     builder.move(FORWARD, 1)
6     builder.move(UP, 1)
7 builder.trace_path(GOLD_BLOCK)

```

Using Python

Here are the detailed steps:

Step 1: Teleport the builder to the entered position

Step 2: Make an array named flower

Step 3: Create a variable called length which is the length of the array flower

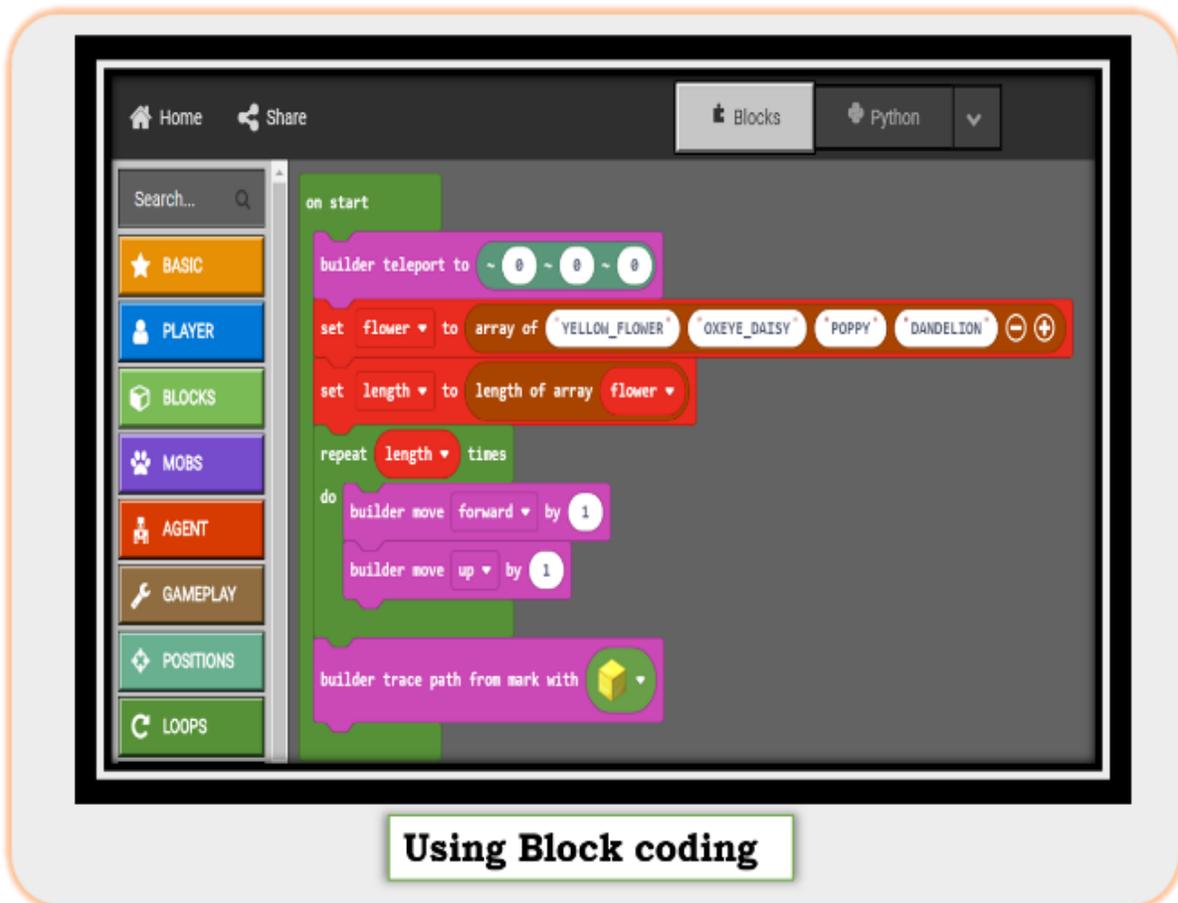
Step 4: Start a for loop which will run as many times as the length of the array

Step 5: Move the builder forward by 1 step and then up by 1 step

Step 6: Finally, the builder traces the path travelled and puts a block on the position

Step 7: When you hit play you will that there is a golden stair created.

Performing the activity using block codes:





BUILDING STAIRS USING ARRAYS

Chapter: Programming With Arrays.

To build a flight of stairs using the material present in the 1st position of the array, using Minecraft coding platform.

Problem Statement: Consider you have been given an array which contains the names of different materials. You then need to calculate the length of this array and determine the material at the first position of the array. Once you have the length of the array and the name of the material at the first position of the array, you need to create a set of stairs having the same length as the array, with the material at the first position of the array. Can you write a program same using python in Minecraft to implement the above steps?

Learning outcome: At the end of this exercise, you will learn:

- How to use create an array in Minecraft and determine its length.
- How to access elements in an array.
- How to use a for loop to create a block of stairs in Minecraft having the same length as that of the array & using a material at a particular position in the array.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

At the end of this activity, the final output should look like shown in the image below:



Final Output – Building Stairs Activity

Below is how the python code will look in Minecraft education edition.

```
1 builder.teleport_to(pos(0, 0, 0))
2 material = [CHISELED_SANDSTONE, STONE, GRANITE, DIORITE]
3 length = len(material)
4 for index in range(length):
5     builder.move(FORWARD, 1)
6     builder.move(UP, 1)
7 builder.trace_path(material[0])
8
9
```

Using Python

Here are the detailed steps:

Step 1: Teleporting the builder to the entered position

Step 2: Make an array named material

Step 3: Creating a variable length which is the length of the array

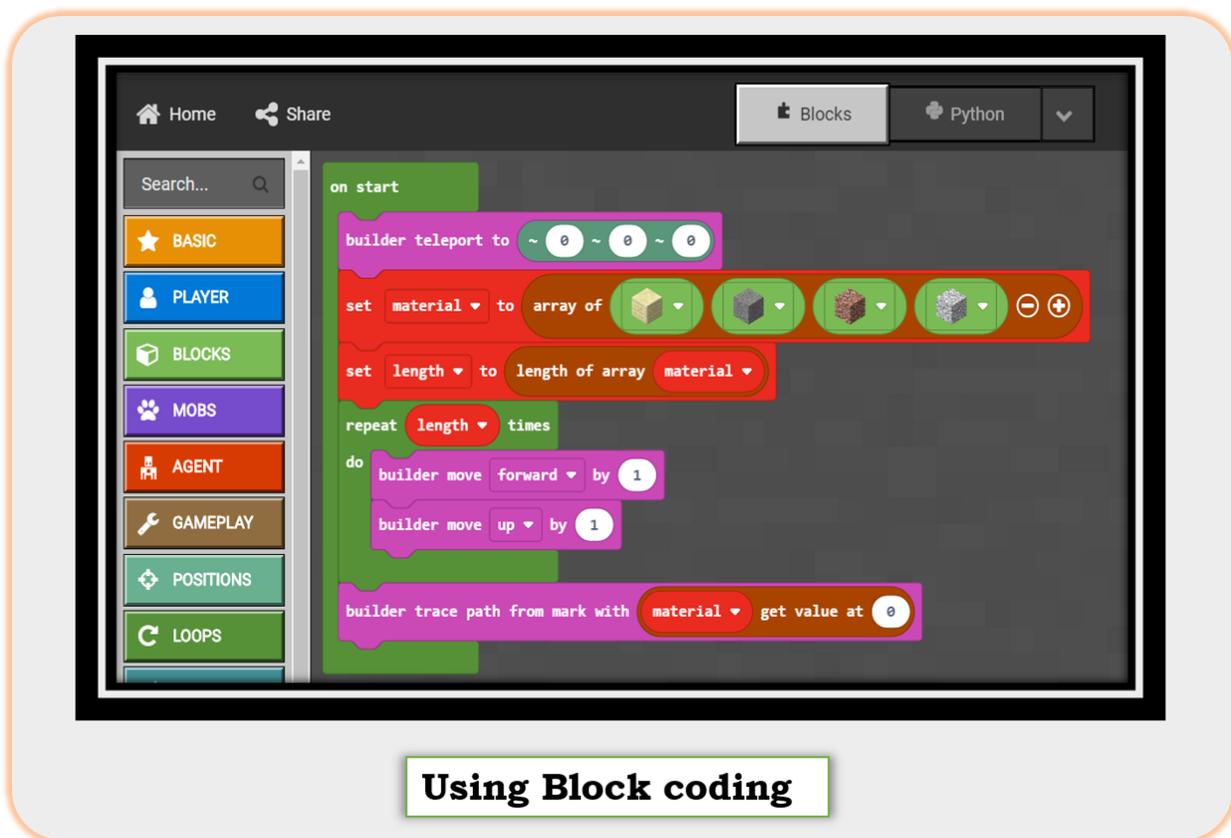
Step 4: Starting a for loop which will run as many times as the length of the array

Step 5: Moving the builder forward by 1 step and then up by 1 step

Step 6: Finally, the builder traces the path travelled and puts a block of material present on the 1st position (Chiseled Sandstone) in the array material on the traced path

Step 7: When you hit play you will that there is a Sandstone stair created.

Using Block code:



PRINT NUMBER DIVISIBLE BY 3 BETWEEN 1 AND 100

Chapter: Advanced Sequencing.

Determine the numbers divisible by 3 between 1 and 100.

Problem Statement: Suppose, you have been given natural numbers from 1 to 100. You need to write a program to find and print the numbers divisible by 3 between 1 and 100 using the Minecraft coding platform.

Learning Outcome: At the end of this exercise, you will learn:

- How to implement the concept of findings numbers divisible by 3 in a computer program.
- How to use modulus operator.
- How to use loops.

Solution: To do this, open Minecraft Code Editor again. You can get the instructions from previous sections for doing that.

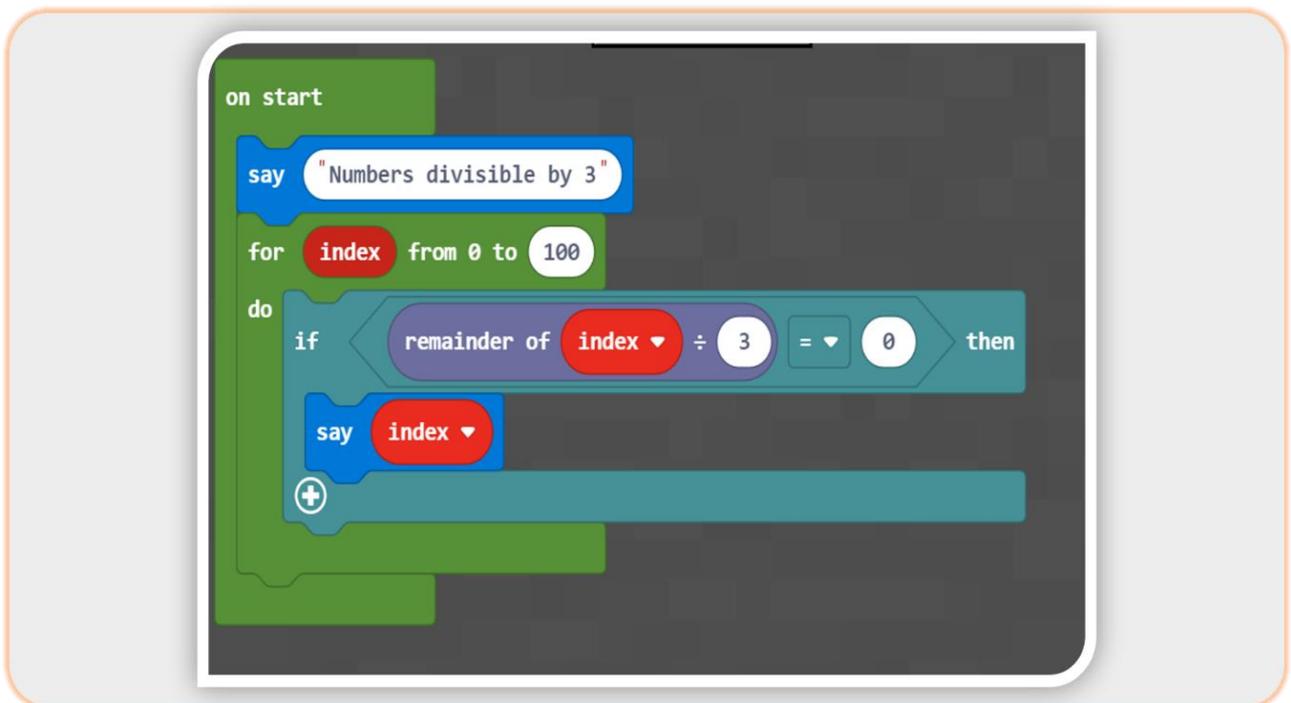
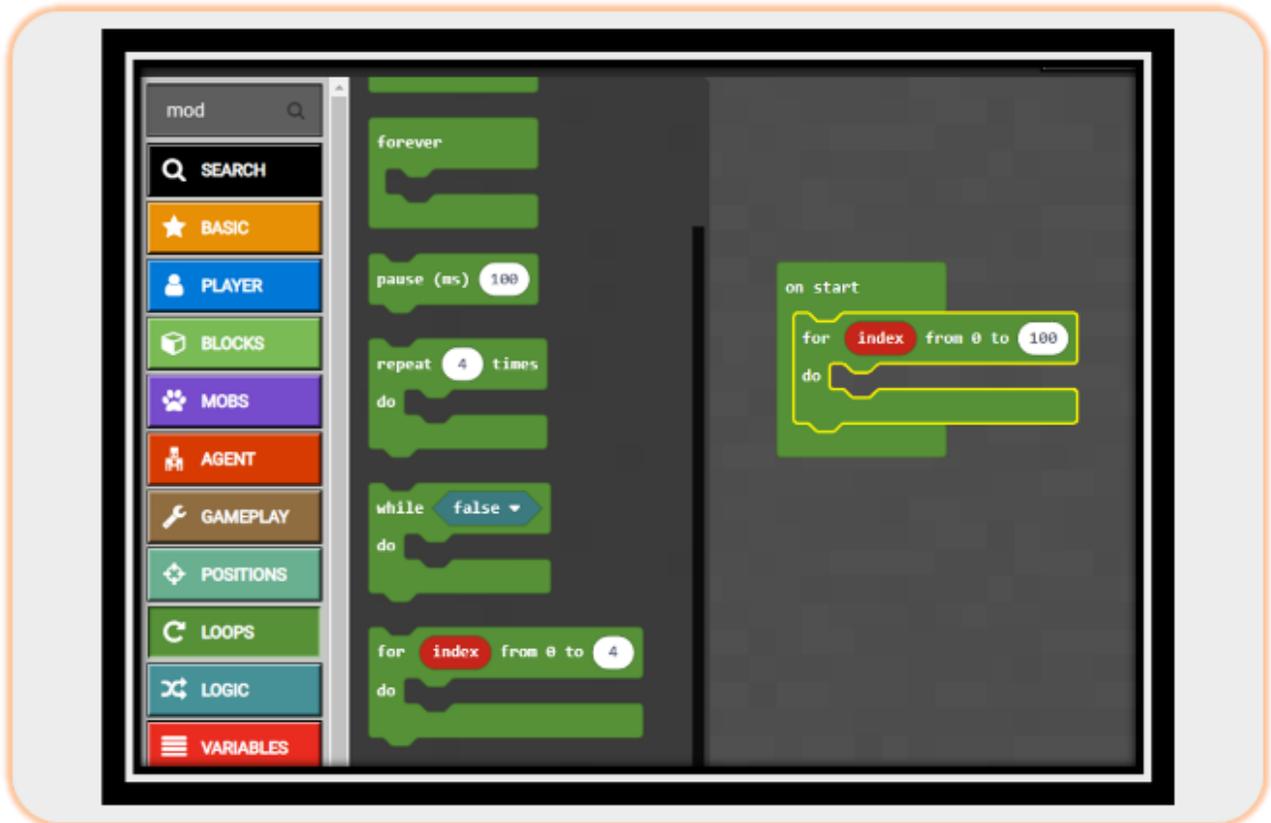
At the end of this activity the final output should look like shown in the image below:

```
[AmitP] Numbers divisible by 3  
[AmitP] 0  
[AmitP] 3  
[AmitP] 6  
[AmitP] 9  
[AmitP] 12  
[AmitP] 15  
[AmitP] 18  
[AmitP] 21  
[AmitP] 24  
[AmitP] 27  
[AmitP] 30  
[AmitP] 33  
[AmitP] 36  
[AmitP] 39
```

**Final Output – Print number divisible by 3
from 1 to 100 Activity**

Let us start to replicate this activity to Iterate a loop from 0 to 100 as shown below

Numbers divisible by 3
between 1 and 100



PRINT THE REVERSE OF AN INTEGER NUMBER

Chapter: Get Creative With Loops.

To print the reverse of an integer number. (e.g. For a given number say 12345, print the reverse i.e 54321)

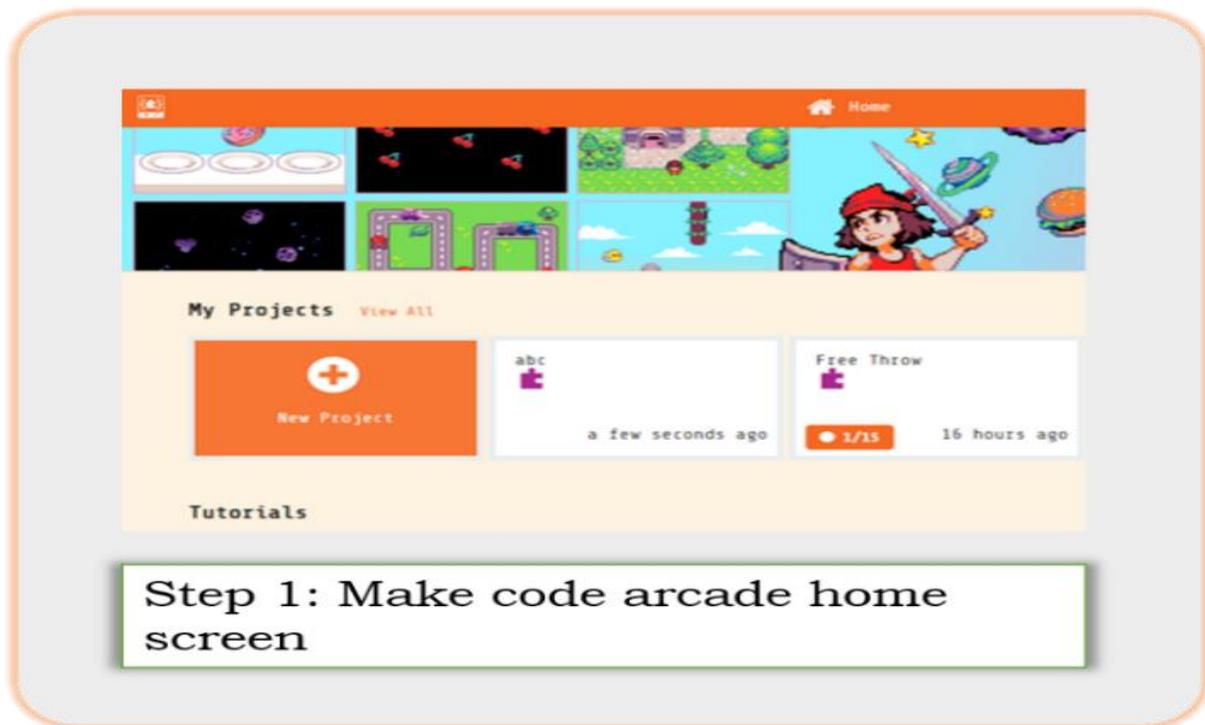
Problem Statement: You have been given an integer number, say N. You need to write a program to print an integer number where the digits are in reverse order compared to the original integer. This needs to be done using the arcade coding platform.

Learning Outcome: At the end of this exercise, you will learn:

- How to play around with an integer to find the reverse of the same.
- How to use modulus operator.
- Advanced usage of looping concept.

Solution: To do this, open the arcade code editor using the following URL:

<https://arcade.makecode.com/>





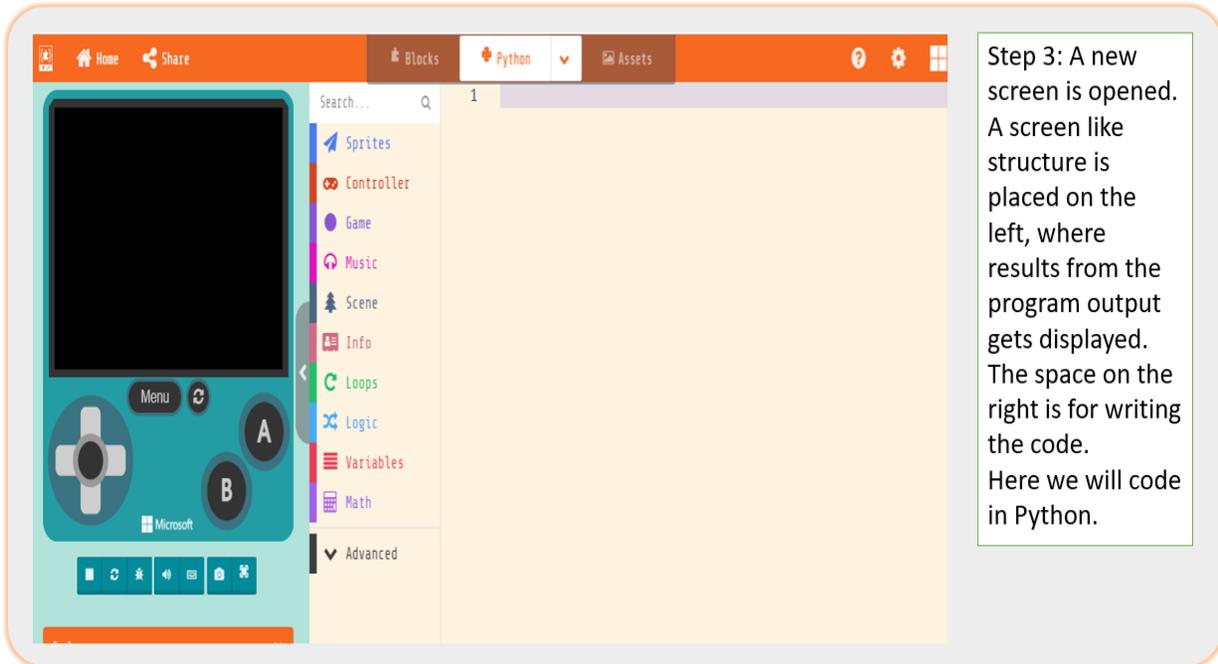
Create a Project 🚀🚀🚀

Give your project a name.

[> Code options](#)

Create ✓

Step 2: Click on new project and name it "Print integer number in reverse order"



Step 3: A new screen is opened. A screen like structure is placed on the left, where results from the program output gets displayed. The space on the right is for writing the code. Here we will code in Python.

```
1 finalNum = 0
2 interNum = 0
3 newNum = 12345
4 storedNum = newNum
5 while newNum > 0:
6     interNum = newNum % 10
7     finalNum = finalNum * 10 + interNum
8     newNum = (newNum - interNum) / 10
9 newNum = storedNum
10 game.splash(convert_to_text(newNum),
11     "reversed is " + convert_to_text(finalNum))
12
```

Step 4: Shown alongside is the code snippet which takes an integer number and prints the reverse using Python.



```
1 finalNum = 0
2 interNum = 0
3 newNum = 12345
4 storedNum = newNum
5 while newNum > 0:
6     interNum = newNum % 10
7     finalNum = finalNum * 10 + interNum
8     newNum = (newNum - interNum) / 10
9 newNum = storedNum
10 game.splash(convert_to_text(newNum),
11             "reversed is " + convert_to_text(finalNum))
12
```

Step 5: Shown alongside is the code snippet & the result generated by it.

Using Block Coding



BUBBLE SORT

Chapter: Get Creative With Loops & Programming With Arrays.

This activity will help you to sort a set of random numbers present in an array either in ascending or descending order.

Problem Statement: Bubble sort is a method of sorting that works by repeatedly swapping adjacent elements if they are in incorrect order. In this problem, you need to sort a given set of numbers in ascending order using bubble sort.

Learning outcome: At the end of this exercise, you will learn:

- How to sort a given set of numbers in ascending order using bubble sort.
- Extend the concept learned here to sort a given set of numbers in descending order using bubble sort.
- The maximum count of value swapping possible to sort a given set of n numbers.

Solution: Let us consider a set of numbers 1, 5, 4, 3, 2; that needs to be sorted in ascending order. Here, we will be using a robot which cannot see so well. It can pick one number in its left hand, and the other number in its right hand, take them close to its eyes to read the numbers. If the number on the left is greater than the number on the right, it swaps the two numbers. This is done until the numbers are sorted in ascending order.

- Following is the list of numbers to be sorted in ascending order:
- We compare the first two numbers and find out which one is greater.
- We start with 1 and 5. Since 5 is already greater than 1, no change is made



- Then we compare the numbers 5 and 4
- Since 5 is greater than 4, we will swap these two numbers.





- Next, we compare 5 and 3
- Since 5 is greater than 3, we will swap the two numbers.



- Lastly, we compare 5 and 2
- Since 5 is greater than 2, we will swap these two numbers



- The list of the numbers is rearranged as follows:
- Notice 5 is the largest number in this list and arranged at the last position.



- We again start from the beginning and compare 1 with 4. Since 4 is greater than 1, no change is made.



- Then we compare the numbers 4 and 3
- Since 4 is greater than 3, we will swap these two numbers.



- Next, we compare 4 and 2
- Since 4 is greater than 2, we will swap the two numbers.



- Lastly, we compare 4 and 5. Since, 5 is greater than 4, no change is made.



- We again start from the beginning and compare 1 with 3. Since 3 is greater than 1, no change is made.



- Then we compare the numbers 3 and 2
- Since 3 is greater than 2, we will swap these two numbers.



- Next, we compare the numbers 3 and 4. Since 4 is greater than 3, no change is made.



- We again start from the beginning and compare 1 with 2. Since 2 is greater than 1, no change is made.



- The numbers are now all sorted in ascending order.



- The exercise of sorting is done until no more numbers need to be swapped.
- If we have 5 numbers, then the maximum time taken to sort the list will be 25 iterations.

SECOND HIGHEST INTEGER IN AN ARRAY OF N INTEGERS

Chapter: Get Creative With Loops & Programming With Arrays.

To find the second highest integer in an array of integers.

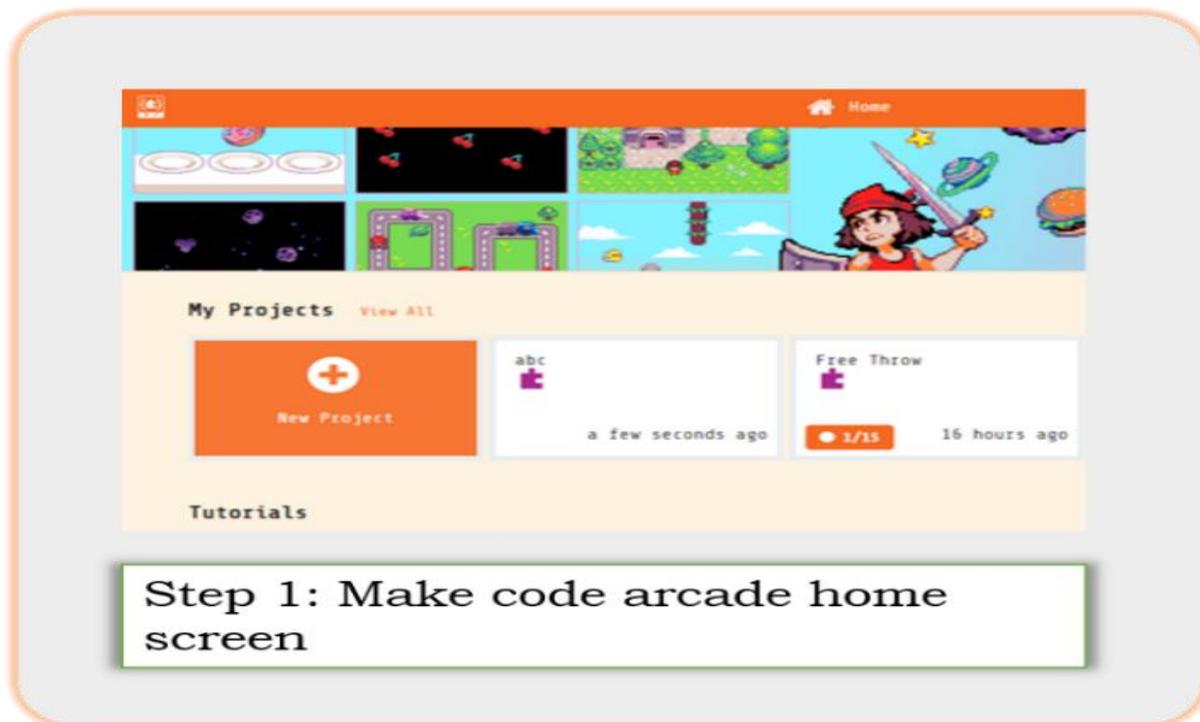
Problem Statement: Suppose you have been given an array of N integers. We need to write a program to find out and print the second highest integer in the array if it exists. This needs to be done using the arcade coding platform.

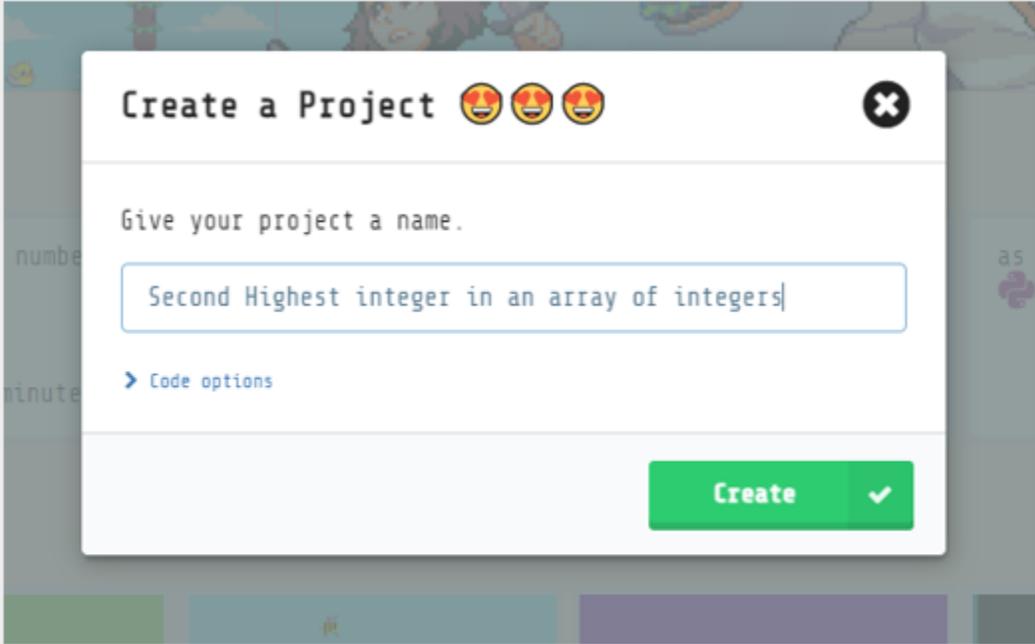
Learning Outcome: At the end of this exercise, you will learn:

- How to play around with arrays to find the second highest integer.
- Advanced usage of loops.
- Application of IF-ELSE IF-ELSE in programming.
- This exercise relates to the concepts that we learnt in Chapter 2 – Get Creative With Loops & in Chapter 4 – Programming With Arrays.

Solution: To do this, open the arcade code editor using the following URL:

<https://arcade.makecode.com/>





Create a Project 😊😊😊

Give your project a name.

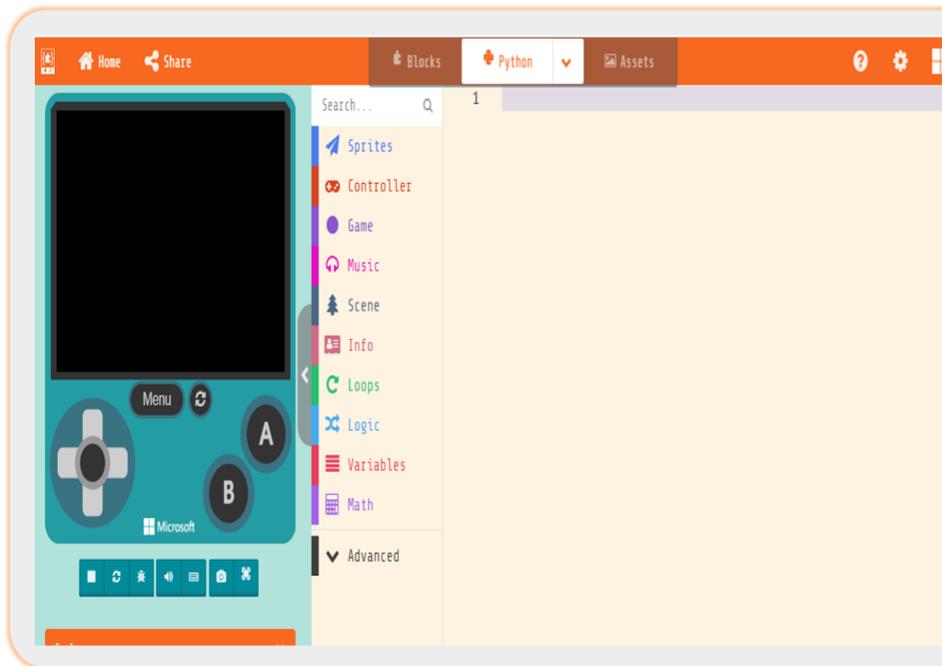
Second Highest integer in an array of integers

[Code options](#)

Create ✓

Step 2: Click on new project and name it “Second highest integer in an array of N integers”

Second highest integer in an array of N integers



Step 3: A new screen is opened. A screen like structure is placed on the left, where results from the program output gets displayed. The space on the right is for writing the code. Here we will code in Python.

```
1 val_holder = 0
2 exArray = [12, 35, 1, 10, 24]
3 first = -2147483648
4 second = -2147483648
5 len_array = len(exArray)
6 index = 0
7 while index <= len_array - 1:
8     val_holder = exArray[index]
9     if val_holder > first:
10         second = first
11         first = val_holder
12     elif val_holder > second and val_holder != first:
13         second = val_holder
14     else:
15         pass
16     index += 1
17 if second == -2147483648:
18     game.splash("There is no second largest element")
19 else:
20     game.splash("Second highest number is", convert_to_text(second))
```

Step 4: Shown alongside is the code snippet to find the second highest integer within an array of integers

Second highest integer in an array of N integers



The screenshot shows a game development interface with a Python code editor on the right and a game preview window on the left. The code defines an array `exArray = [12, 35, 1, 10, 24]` and finds the second highest value, which is 24. The game preview window displays the text "Second highest number is 24".

```
1 val_holder = 0
2 exArray = [12, 35, 1, 10, 24]
3 first = -2147483648
4 second = -2147483648
5 len_Array = len(exArray)
6 index = 0
7 while index <= len_Array - 1:
8     val_holder = exArray[index]
9     if val_holder > first:
10        second = first
11        first = val_holder
12    elif val_holder > second and val_holder != first:
13        second = val_holder
14    else:
15        pass
16    index += 1
17 if second == -2147483648:
18     game.splash("There is no second largest element")
19 else:
20     game.splash("Second highest number is", convert_to_text(second))
21
```

Step 5: Shown alongside is the code snippet & the result generated by it.

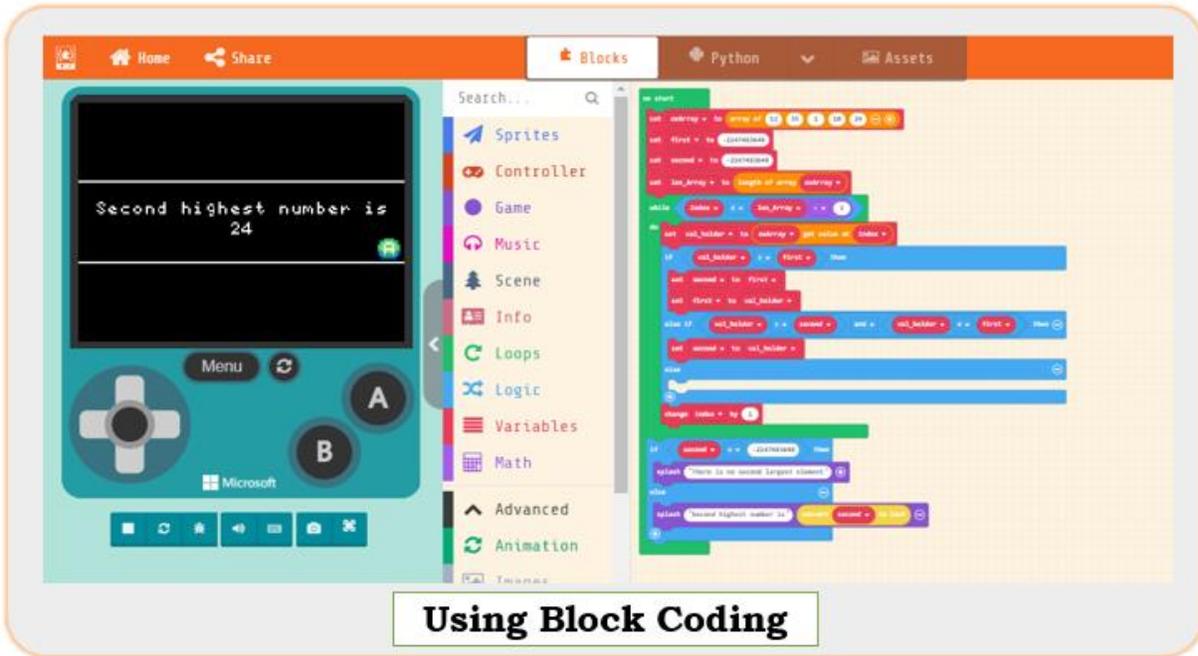


The image shows a Scratch script designed to find the second highest integer in an array. The script starts with an 'on start' block, followed by a 'set' block for 'arrArray' containing the array [12, 25, 1, 29, 34]. It then initializes 'first' and 'second' to -2147483648. The length of the array is stored in 'lenArray'. A 'while' loop starts at 'Index = 1' and continues until 'Index = lenArray'. Inside the loop, the value at the current index is stored in 'val_holder'. If 'val_holder' is greater than 'first', 'second' becomes 'first' and 'first' becomes 'val_holder'. Else if 'val_holder' is greater than 'second' and 'val_holder' is not equal to 'first', 'second' becomes 'val_holder'. The index is incremented by 1. After the loop, an 'if' block checks if 'second' is still -2147483648. If true, it says 'There is no second largest element'. Otherwise, it says 'Second highest number is' followed by the value of 'second'.

```
on start
  set arrArray to array of 12 25 1 29 34
  set first to -2147483648
  set second to -2147483648
  set lenArray to length of array arrArray
  while Index = 1 to lenArray
    set val_holder to arrArray get value at Index
    if val_holder > first then
      set second to first
      set first to val_holder
    else if val_holder > second and val_holder != first then
      set second to val_holder
    else
      do nothing
    change Index by 1
  if second == -2147483648 then
    splash "There is no second largest element"
  else
    splash "Second highest number is" convert second to text
```

Using Block Coding

Second highest integer in
an array of N integers





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