Shake, Code & Battle: micro:bit Rock Paper Scissors

Overview

In this engaging project, you'll learn how to program your micro:bit to play Rock Paper Scissors using a combination of buttons, gestures, and the LED display. We'll start by understanding the basic game logic and how to represent rock, paper, and scissors using different inputs. You'll discover how to use random selection for the computer's choice, display game outcomes using animations, and keep track of scores. Through this project, you'll develop fundamental coding concepts like variables, conditionals, and loops while creating something fun and interactive. By the end, you'll have a fully functional game that you can play with friends or challenge the computer – all powered by your micro:bit!

What you will Learn

- [ ] How to create and use a Variable
- [ ] How to use the micro:bit accelerometer shake gesture
- [ ] How to display images/shapes on the LED matrix
- [ ] How to use conditional if/else statements
- [ ] How to use comparison operators
- [ ] How to randomise choices

What you will Need

- 1 x micro:bit
- 1 x micro USB cable
- 1 x battery pack for the micro:bit (optional)

Importing Python Libraries

On **line 3** type `import random` and press enter.

Creating the while True loop

Type the following line of code under `import random`

```
while True:
```

Once you press enter your cursor will automatically indent. Start typing the rest of your code from here.

Creating the Rock Paper Scissor Variables

> WHAT IS A VARIABLE
> Think of a variable as a box that stores information that can be used throughout our program. We give variables a descriptive name so we and others can understand what is going on within our program.

To create the rock paper scissors variables type the following code:

```
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
```

Your code will look like this:

```
# Imports go at the top
from microbit import *
import random
while True:
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
```

Creating the on shake Action

To create the on shake action type the following code below the variables section.

```
    if accelerometer.was_gesture('shake'):
        choice = random.randint(0,2)
```

Your completed code so far will look like this:

```
# Imports go at the top
from microbit import *
import random

while True:
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
    if accelerometer.was_gesture('shake'):
        choice = random.randint(0,2)
```

Creating the Choice = 0 Condition

Under the `choice = random.randint(0,2)` line we are going to create an if condition to determine what will happen if choice = 0.

Type the following code:

```
    if choice == 0:
        display.show(Paper)
```

This will display paper on the LED matrix if choice equals 0.

Completed code so far:

```
# Imports go at the top
from microbit import *
import random

while True:
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
    if accelerometer.was_gesture('shake'):
        choice = random.randint(0,2)
        if choice == 0:
            display.show(Paper)
```

Creating the Choice = 1 Condition

Under the `display.show(Paper)` line we are going to create an elif condition to determine what will happen if choice = 1.

> NOTE
> Make sure you unindent your code so your cursor is back in line with the if condition.

Type the following code:

```
    elif choice == 1:
        display.show(Rock)
```

This will display rock on the LED matrix if choice equals 1.

Completed code so far:

```
# Imports go at the top
from microbit import *
import random

while True:
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
    if accelerometer.was_gesture('shake'):
        choice = random.randint(0,2)
        if choice == 0:
            display.show(Paper)
```

```
        elif choice == 1:
            display.show(Rock)
```

Creating the Choice = 2 Condition

Under the `display.show(Rock)` line we are going to create an else condition to determine what will happen if choice = 2.

> NOTE
> Make sure you unindent your code so your cursor is back in line with the elif condition.

Type the following code:

```
    else:
        display.show(Scissors)
```

This will display scissors on the LED matrix if choice equals 1.

Completed Code

```
# Imports go at the top
from microbit import *
import random

while True:
    Paper = Image("99999:90009:90009:90009:99999")
    Rock = Image("00000:09990:09990:09990:0000")
    Scissors = Image("90099:09099:00900:09099:90099")
    if accelerometer.was_gesture('shake'):
        choice = random.randint(0,2)
        if choice == 0:
            display.show(Paper)
        elif choice == 1:
            display.show(Rock)
        else:
            display.show(Scissors)
```

Well done you have now completed the code for the rock, paper scissors game. Let's move on to learn how to download it to the micro:bit.

Pairing the micro:bit to your computer

1. Take the micro USB cable and connect the micro:bit to the computer.
2. Select the **3 little dots** next to **send to micro:bit**.

3. Select **Connect** and follow the on screen prompts.

Downloading code to the micro:bit

1. Select **Send to micro:bit** to download the code to your micro:bit.

Lets move on to see how to play.

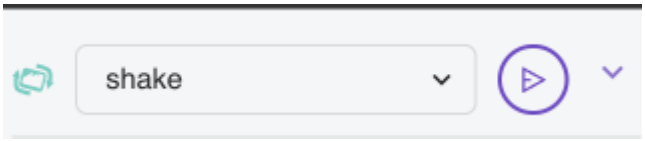
Well done you have created your very own Rock Paper Scissors game for the micro:bit.

How to Play

Web Browser

The Python Editor has a built-in micro:bit simulator so you can use this if you don't have a micro:bit handy.

Under the micro:bit simulator you will see that the shake function is selected and if you click on the play button next to it this will simulate the micro:bit being shaken and display either the rock, paper or scissors icon on the LED matrix.



Using the micro:bit

Once you have downloaded the code to your micro:bit you can shake the micro:bit and see a rock, paper or scissors image appear on it.

Find a partner and start playing or play against yourself.