

Lesson 6 - All sorts of computers!

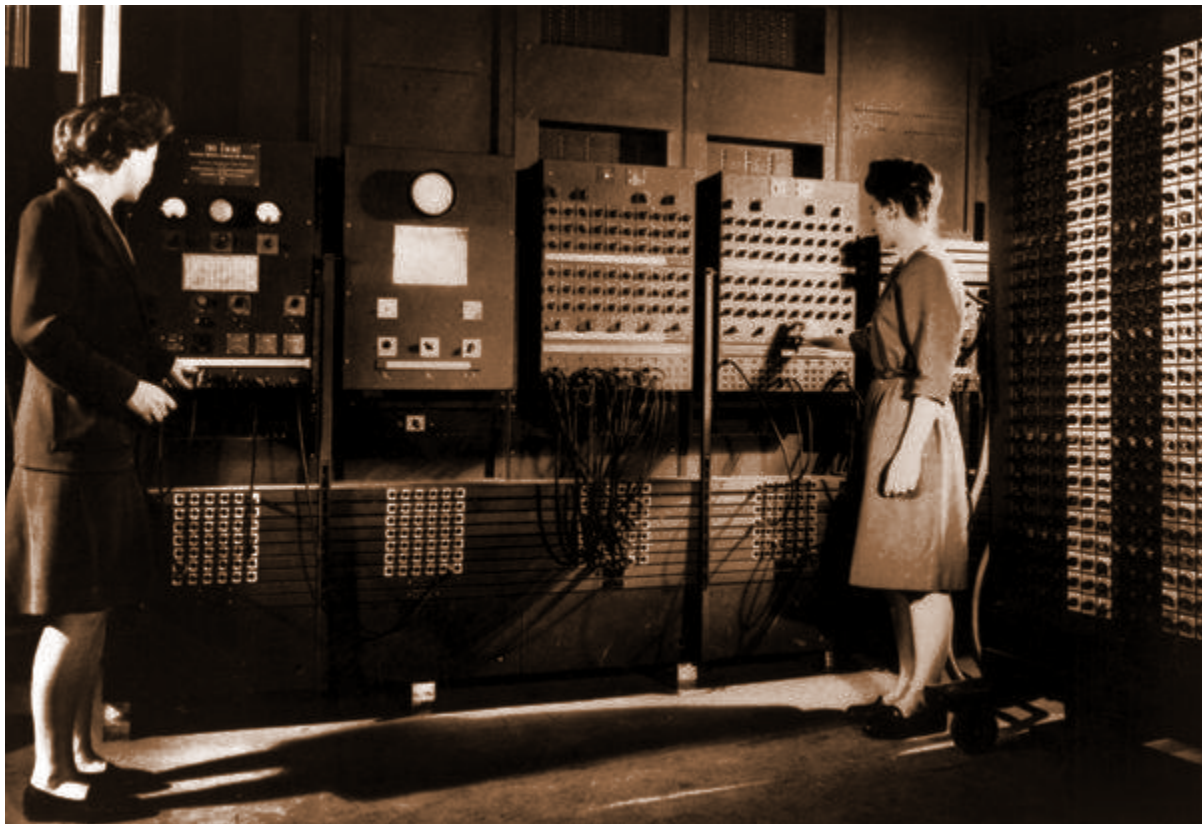
Test your knowledge!

- How does a computer use math to make a decision?

All kinds of computers...

So far, what kind of computers have we used? Some of us call them laptops, even tablets.... They are all kinds of PCs – Personal Computers.

What's the "personal" all about? Well, a long time ago, a computer looked like THIS!



1943: ENIAC <https://www.computerhistory.org/revolution/birth-of-the-computer/4/78>

This was the ENIAC – the first electronic computer! It was the size of a big room, and could only do simple math! Isn't that crazy? ENIAC was made out of big switches called Vacuum tubes! They looked like big light bulbs – and were just as big and hot as a light bulb!

Vacuum Tubes

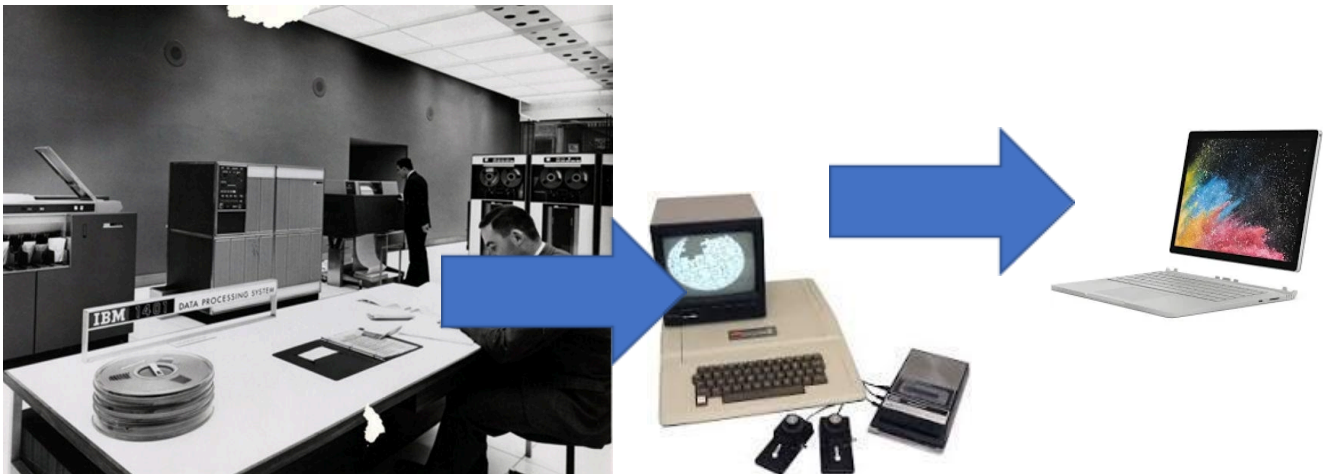


In the 1980's, computers started getting really SMALL – we started using switches that were much, much smaller, called TRANSISTORS. These were made out of silicon (yep, sand!). The magical part is we figured out how to put millions of them in a really small space... and invented the microprocessor!



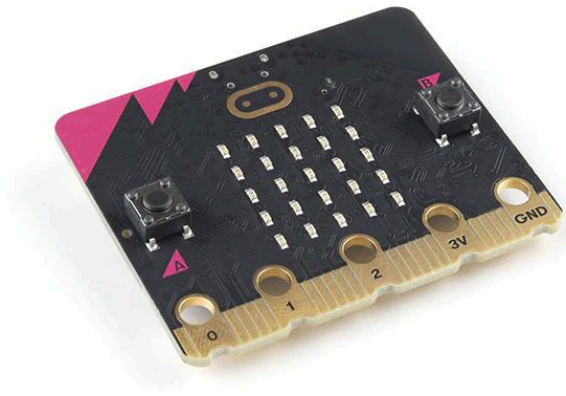
Intel 4004: the first processor

After that, we were off to the races! Computers went from being big machines that only a few could own, to something we could all have!



Now we can put computers ANYWHERE! Can you name some computers in this room?

We're going to write a PYTHON program to control a cool little computer called a BBC Micro:bit!



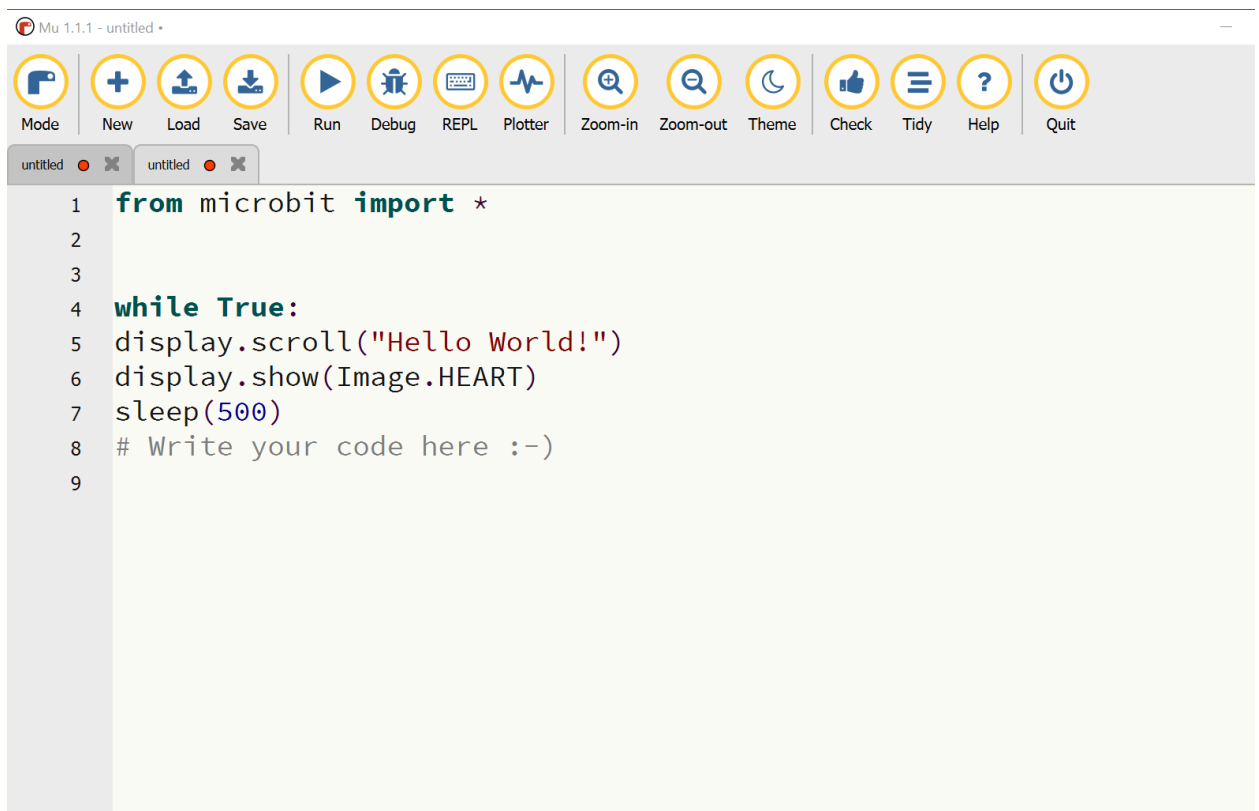
This little computer is thousands of times more powerful than those early computers... and fits in the palm of our hand! It also has some super cool INPUTS and OUTPUTS. So, instead of just using input and print statements, we can start doing things like making lights blink and measuring stuff. Sound cool?

Today we're going to learn how to make our micro:bit:

1. Make lights blink
2. Measure sound
3. React to sound

***You can access a virtual python microbit environment at <https://python.microbit.org/v/3>**

Assignment 1: Hello, world!



The screenshot shows the Mu Python IDE interface. The title bar reads "Mu 1.1.1 - untitled". The top toolbar contains icons for Mode, New, Load, Save, Run, Debug, REPL, Plotter, Zoom-in, Zoom-out, Theme, Check, Tidy, Help, and Quit. Below the toolbar, there are two tabs labeled "untitled". The main code editor area contains the following Python code:

```
1 from microbit import *
2
3
4 while True:
5     display.scroll("Hello World!")
6     display.show(Image.HEART)
7     sleep(500)
8     # Write your code here :-)
```

Question: What does this program do?

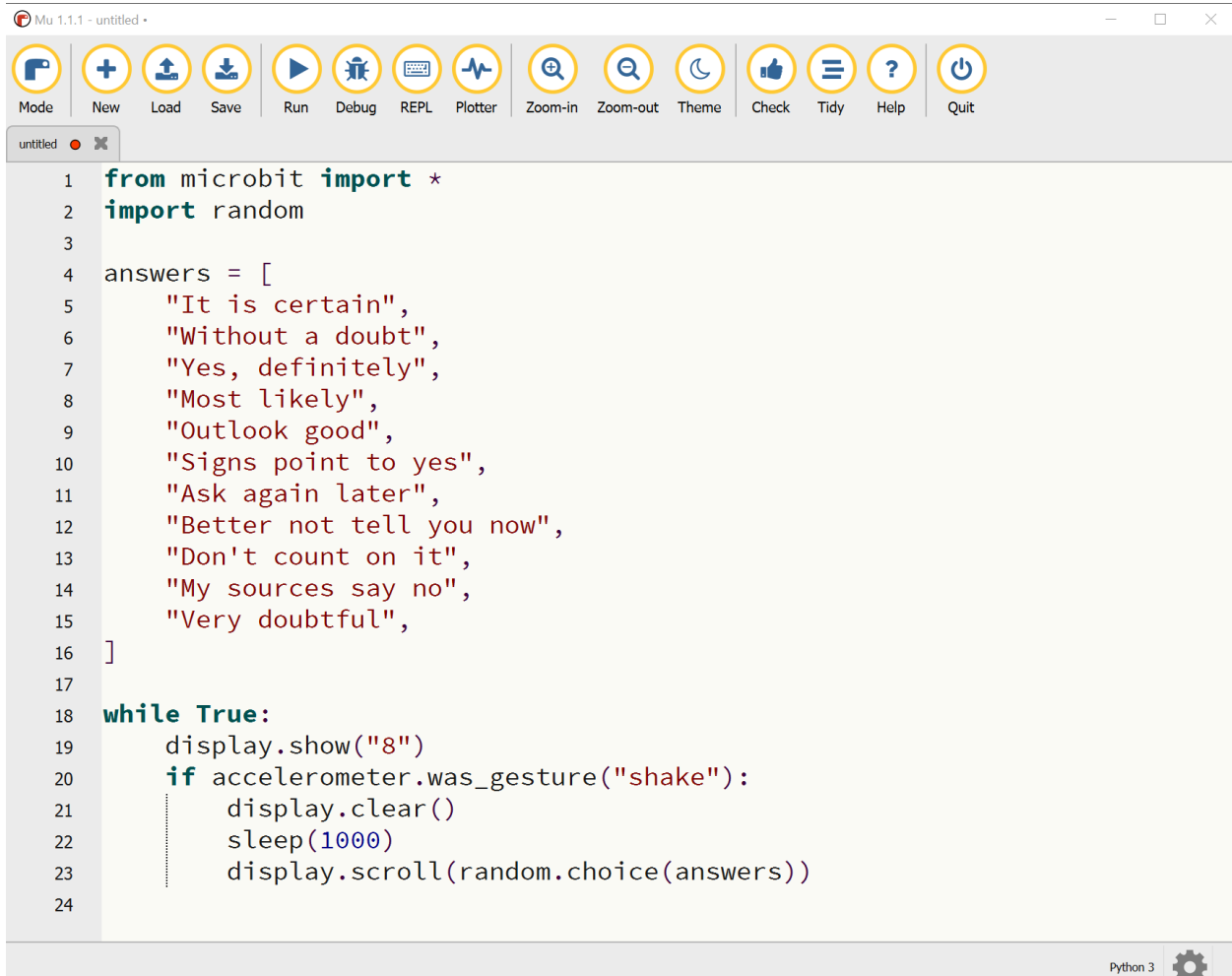
Now customize it! Change the print statement and the image to make your own unique program.

Image Reference Guide

- `Image.HEART`
- `Image.HEART_SMALL`
- `Image.HAPPY`
- `Image.SMILE`
- `Image.SAD`
- `Image.CONFUSED`
- `Image.ANGRY`
- `Image.ASLEEP`
- `Image.SURPRISED`
- `Image.SILLY`
- `Image.FABULOUS`
- `Image.MEH`
- `Image.YES`
- `Image.NO`
- `Image.CLOCK12`, `Image.CLOCK11`,
`Image.CLOCK10`, `Image.CLOCK9`,
`Image.CLOCK8`, `Image.CLOCK7`,
`Image.CLOCK6`, `Image.CLOCK5`,
`Image.CLOCK4`, `Image.CLOCK3`,
`Image.CLOCK2`, `Image.CLOCK1`
- `Image.ARROW_N`, `Image.ARROW_NE`,
`Image.ARROW_E`, `Image.ARROW_SE`,
`Image.ARROW_S`, `Image.ARROW_SW`,
`Image.ARROW_W`, `Image.ARROW_NW`
- `Image.TRIANGLE`
- `Image.TRIANGLE_LEFT`
- `Image.CHESSBOARD`
- `Image.DIAMOND`
- `Image.DIAMOND_SMALL`
- `Image.SQUARE`
- `Image.SQUARE_SMALL`
- `Image.RABBIT`
- `Image.COW`
- `Image.MUSIC_CROCHET`
- `Image.MUSIC_QUAVER`
- `Image.MUSIC_QUAVERS`
- `Image.PITCHFORK`
- `Image.XMAS`
- `Image.PACMAN`
- `Image.TARGET`
- `Image.TSHIRT`
- `Image.ROLLERSKATE`
- `Image.DUCK`
- `Image.HOUSE`
- `Image.TORTOISE`
- `Image.BUTTERFLY`
- `Image.STICKFIGURE`
- `Image.GHOST`
- `Image.SWORD`
- `Image.GIRAFFE`
- `Image.SKULL`
- `Image.UMBRELLA`
- `Image.SNAKE`
- `Image.SCISSORS`

Assignment 2: Magic Microbit

This program will transform your micro:bit into a Magic 8 ball!



The screenshot shows the Mu Python IDE interface. The title bar reads "Mu 1.1.1 - untitled". The toolbar contains icons for Mode, New, Load, Save, Run, Debug, REPL, Plotter, Zoom-in, Zoom-out, Theme, Check, Tidy, Help, and Quit. The main editor area shows the following Python code:

```
1 from microbit import *
2 import random
3
4 answers = [
5     "It is certain",
6     "Without a doubt",
7     "Yes, definitely",
8     "Most likely",
9     "Outlook good",
10    "Signs point to yes",
11    "Ask again later",
12    "Better not tell you now",
13    "Don't count on it",
14    "My sources say no",
15    "Very doubtful",
16 ]
17
18 while True:
19     display.show("8")
20     if accelerometer.was_gesture("shake"):
21         display.clear()
22         sleep(1000)
23         display.scroll(random.choice(answers))
24
```

The bottom right corner of the IDE shows "Python 3" and a gear icon for settings.