CoderDojo Athenry

HaCkeRS

Notes by Michael Madden, CoderDojo Athenry, 2019

Programming Languages

- Tell computer how to perform tasks
- C, C++, Java, Visual Basic, Python, JavaScript, PHP, HTML5

```java
public static void calcWages()
{
    double rate, hrs, wage, over, total;

    rate = askForNumber("Enter Hourly Rate:");
    hrs = askForNumber("Enter Hours Worked:");

    if (hrs <= 40) {
        wage = rate * hrs;
        over = 0;
    }
    else {
        wage = rate * 40;
        over = (hrs - 40) * 1.5 * rate;
    }
    total = wage + over;

    JOptionPane.showMessageDialog(null, "Total wages are " + total);
}
```

Some Java Code – even if you have never seen Java before, can you make sense of it?

Programming Languages

Input, Output & Store Data

- E.g. text, numbers, LEDs, buttons

Operate on Data

- E.g. add numbers, change text
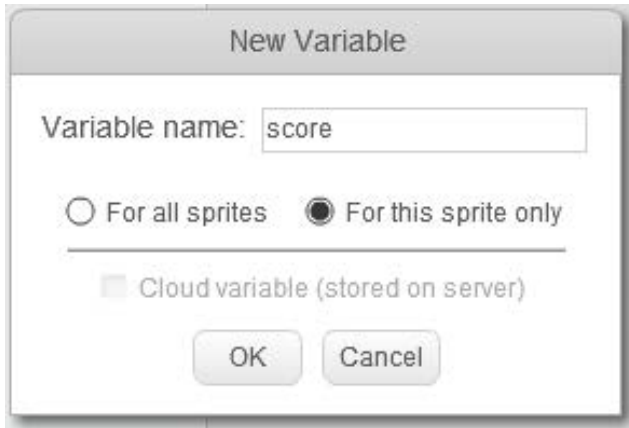
Loops

- Repeat commands several times

Decisions

- Do something IF something else is true

Programming Arduino

- The Arduino programming language is a **subset** of a language called C++, which is based on a language called C
- These are industry-standard languages that many professional programmers use
- Because it is a microcontroller, Arduino has its own special functions like **setup()** and **loop()** and works mainly with input/output pins
- Write a program on a computer in the Arduino IDE and upload them to the microcontroller
- Then, whenever it is powered up, it runs **setup**() once and then keeps running **loop**()

Scratch vs. C:
Variables & Operators


```
int score;


score = 1;
score = 2 + 3;
score = score + 5;

String message =
  String("hello ") +
  String("world");

int len = message.length();
```
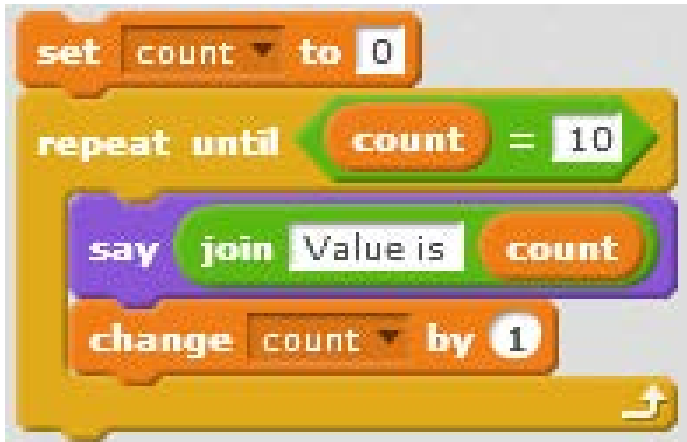
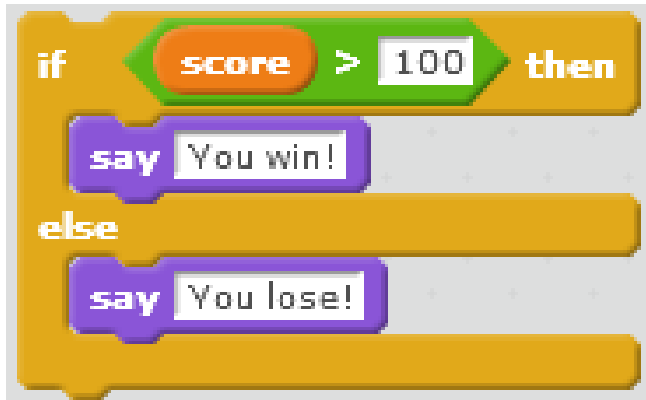# Scratch vs. C: Loops


```
for (int i=0; i<10; i++)
{
  Serial.println("Hello");
}


int count = 0;
while (count <= 10)
{
  Serial.print("Value is ");
  Serial.println(count);
  count++;
}
```

Scratch vs. C: Decisions


```
if (score > 100)
{
  Serial.println("You win!");
}
else
{
  Serial.println("You lose!");
}
```