

EET 2812

Activity 6

Single Board Computer (RPI)

Programming – Control Structures

Cuyahoga Community College

Youth Technology Academy



ACTIVITY

Programming with Python on RPi

Control Structures

Overview: Create a program called “construct.py” and use it to write a program that demonstrates how control structures work.

Vocabulary: control structures, iteration, selection, flow chart, while loop, if/else statement.

Log into RPi using the default log in.

Username: pi

Password: raspberry

Control Structures:

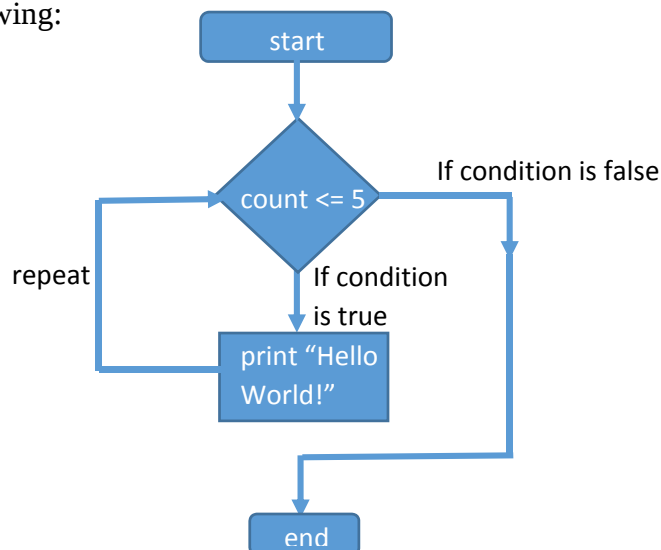
A control structure in any programming language allows you to perform iteration (repeat something multiple times) or selection (ask questions and then, based on the result, perform different actions).

Iteration can be done in Python using a “while” statement. The while statement repeats a body of code as long as a specified condition is true.

Selection can be done in Python using an “if” or “ifelse” statement.

Flow Chart:

A flow chart is a diagram that represents a computer program graphically. For example, if we would like to print the phrase “Hello World!” five times a flow chart of this program would look like the following:



Create a program that writes the phrase “Hello World!” multiple times using a “while loop”.

If necessary, open a terminal window.

Remember: “\$” means “type what follows on the command line”

- change to the my_python directory by typing

\$cd my_python

Create and open a text file called construct.py by typing:

\$nano construct.py

To use the “while” statement you need to set up a variable that will be used to count the number of times an action is performed by the program. Then, the while statement will do what you ask it to do a specific number of times. When the counter reaches the target number the program will skip the code that is indented after the “while loop” and continue with the rest of the program, if there is any. For example;

Type the following code into your **construct.py** document:

```
counter=1
while counter <= 5:
    print("Hello World!")
    counter=counter + 1
```

Then press **CTRL O** to write (save) the file, **ENTER** and then **CTRL X** to exit. When finished type in the command **\$sudo python construct.py** to run the program.

The program should print the phrase “Hello World!” five times:

```
Hello World!
Hello World!
Hello World!
Hello World!
Hello World!
```

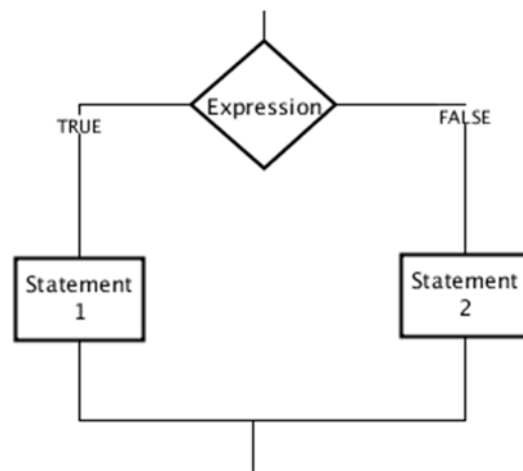
if/else statements

Flow Chart:

If the Expression is true complete Statement 1.

If the Expression is false complete Statement 2.

Continue with the program



Create a program that asks a question and responds differently depending on the answer provided using if/else statements.

Open the text file called construct.py by typing:

\$nano construct.py

Type in the following code:

```
grade = float(input("What grade are you in?"))
if grade =11:
    print "You're in the right class."
```

Then press **CTRL O** to write (save) the file, **ENTER** and then **CTRL X** to exit. When finished type in the command **\$sudo python construct.py** to run the program.

What was the result? _____

Now open the file again and edit it:

```
grade = float(input("What grade are you in?"))
if grade =11:
    print "You're in the right class."
else:
    print "You're in the wrong class."
```

Then press **CTRL O** to write (save) the file, **ENTER** and then **CTRL X** to exit. When finished type in the command **\$sudo python construct.py** to run the program.

What was the result? _____

Your Turn:

1. Write a program that uses a while statement that prints a statement multiple times using a counter.
2. Write a program that uses an if/else statement to ask a question and prints a different answer depending on the user's input.