Introduction to programing

Before to start

NOT

x	x'
0	1
1	0

AND

x	y	xy
0	0	0
0	1	0
1	0	0
1	1	1

OR

x	y	x+y
0	0	0
0	1	1
1	0	1
1	1	1

XOR

x	y	$x \oplus y$
0	0	0
0	1	1
1	0	1
1	1	0

Bit

The information in the computer is stored in bytes.

1 Byte = 8 bits

1 kByte = 1024 Bytes

Basics of programming

- Programming – writing commands for computer or microcontrollers.
- Source code – text files with commands.
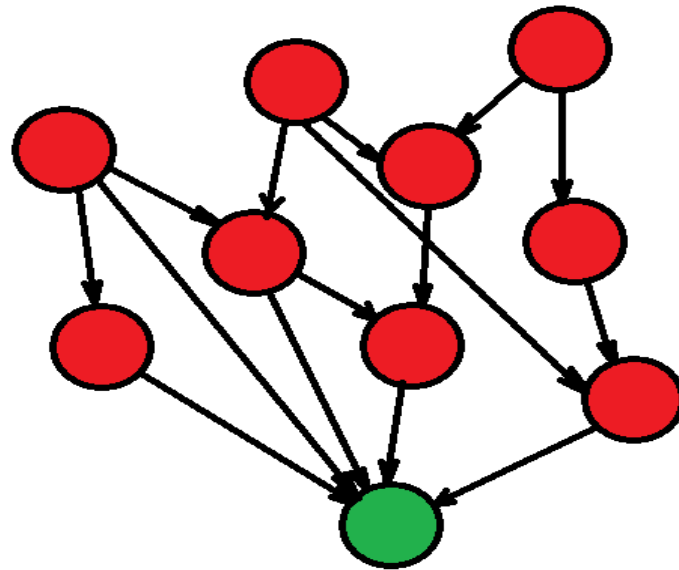- Executable file – ready to use file for operational system.

Source code -> (bytecode ->) machine code (over Assembly language) -> executable file

Executable file -> machine code -> CPU

Classification

- Paradigms
- Compilation or Interpretation
- Purpose

Picture of influence of imagine "red" programming languages on imagine "green language"

Python programing language

Learning resource

- https://www.w3schools.com/python/default.asp
- https://www.tutorialspoint.com/python/index.htm
- https://www.learnpython.org/en/Hello%2C_World%21

Link to free editors

- https://notepad-plus-plus.org/downloads/
- https://code.visualstudio.com/

General

```
print("Hello world!")


a = 5
b = 3
c = a + b
print(c)
```

Variables

num = 5; # integer number

f_num = 0.5 # float number

name = "Computer" # string

More:
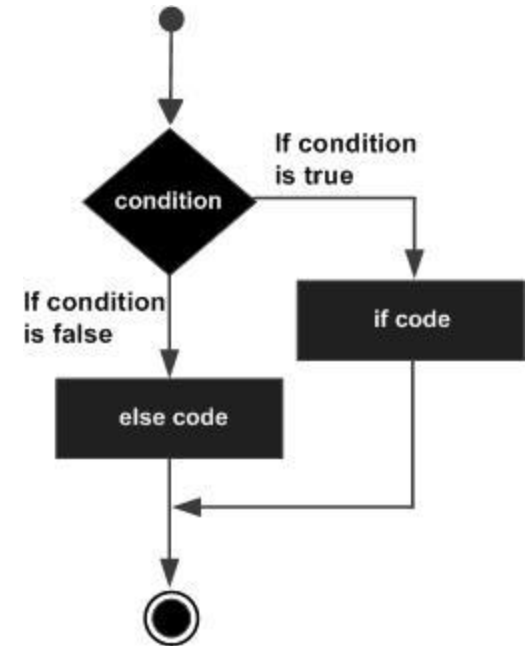https://www.tutorialspoint.com/python/python_variable_types.htm

Condition operators

- and
- or
- not
- ==
- !=
- >
- >=
- <
- <=

https://www.tutorialspoint.com/python/python_basic_operators.htm

Statement

```
if (condition):
    print("if code")
else:
    print("else code")


if (0 > 5):
    print("This line should not be printed")
else:
    print("0 is less than 5")
```
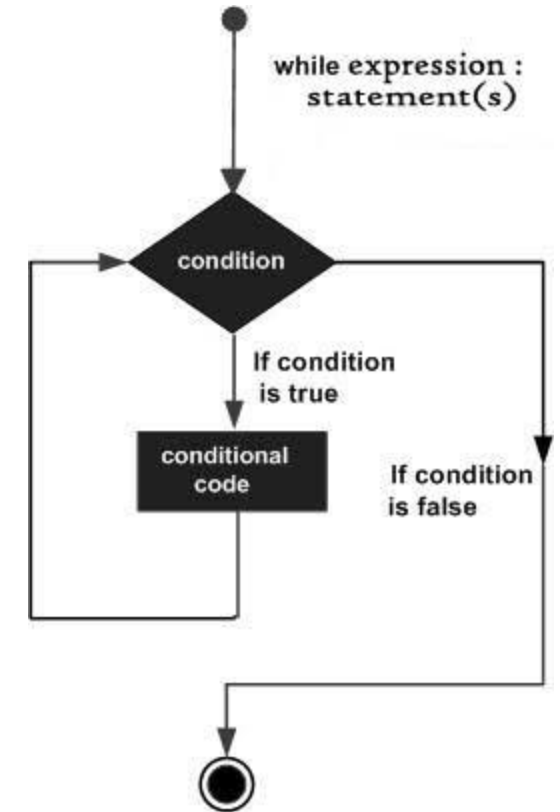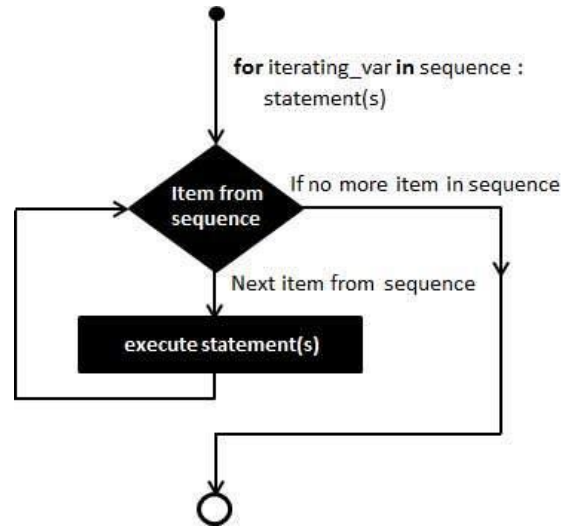
https://www.tutorialspoint.com/python/python_decision_making.htm

Loops

```python
for letter in 'Python':    # First Example
   print("Current letter:", letter)


count = 0
while (count < 9):
   print("The count is:", count)
   count = count + 1
```


- https://www.tutorialspoint.com/python/python_loops.htm

Example 1

```python
# variables: (but not necessary)
name = ""
age = 0

name = input("Please enter your name:\n")
age = input("Please enter your age:\n")
print(f"Your name is {name} and you are {age} years old\n")
age = int(age)
if (age >= 18):
    print("Move along old man")
else:
    print("This club is for adults")
```

Example 2

```
count = 0

print("Here is squares of numbers:")

while (count < 11):
    print(f"{count} * {count} = {count*count}")
    count = count + 1
```

```
print("") => output text
print(f"text: {variable}") => output text with variable
print("text:", variable) => output text with variable
input("") => user's input which returns string type
int("number") => converts string to int(number) type
```