COMPUTER SCIENCE EDUCATION WEEK
2018

INTRODUCTION TO PROGARAMMING

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Introduction to Programming

Outline

Computer Program and Programming
Introduction to Python
Variables and Statements
Loops
Lists
Dictionaries

COMPUTER SCIENCE EDUCATION WEEK 2018

Computer Program: is a collection of instructions that performs a specific task when executed by a computer.

TO REALIZE THE POWER OF PROGRAMMING...JUST THINK THAT EVERY GOOGLE SEARCH INVOLVES A SEARCH AMONG 30 TRILLION PAGES, USUALLY IN UNDER A SECOND!

How do we communicate with computers?

COMPUTER SCIENCE EDUCATION WEEK, 2018

PROGRAMMING LANGUAGES

- Programming languages are used in computer programming to create programs that implement specific algorithms.
- There are over 500 programming languages to choose from for programmers, but some programming languages are just more powerful and widely used than others.
- Today, we will learn some Python: an easy to learn, yet one of the most widely used and powerful programming languages available at your disposal.

```
print "Hello, world"
```

Varialbes

A variable is a reserved memory location to store information.

You can use variables in Python to store different type of data, like strings, booleans, numbers, and other advanced data structures.

How to define a variable in Python?
variable name = variable Value

Example:

```
x = 5
y = 10
z = x + y
```

```
name = "Bob"
city = "Dallas"
```

Statements

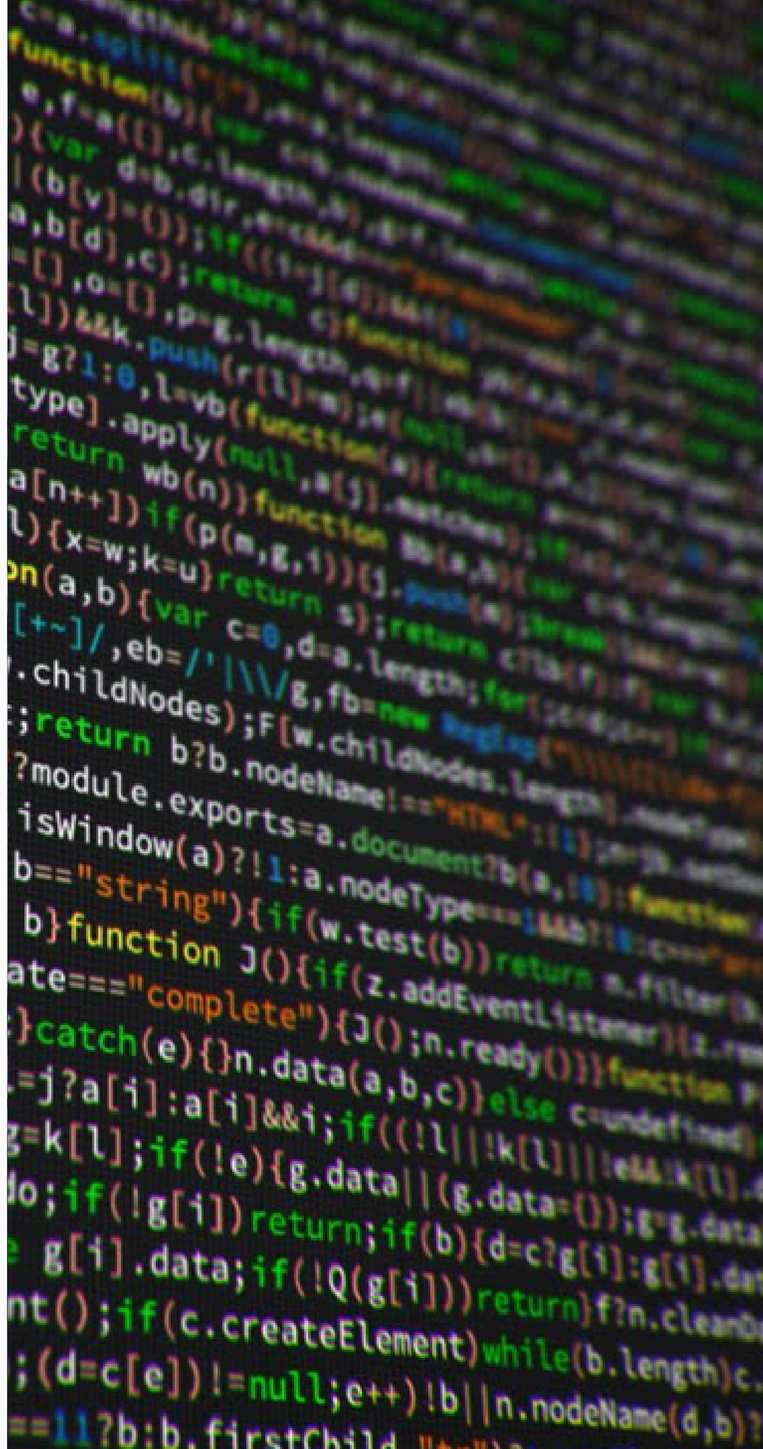
A statement represents an action or command in a program. A program is simply a collection of a bunch of statements.

Assignment Statements

```
x = 10
```

If Statements

```
if x < 10:
    print "x is less than 10"
```



```
majors = ["Music", "Physics", "Art", "Biology"]
grades = [85, 72, 94, 88, 99]
```

Lists

A list is a data structure in Python that is a changeable, ordered sequence of elements.

Defining a list

my_empty_list = []

list_of_numbers = [10, 15, 20, 25]

> Note that elements in lists are indexed. The first element has index 0, the second has index 1, etc.

Accessing elements of a list

third_string = list_of_strings[2] # gives the string at index 2

Manipulating lists:

list_of_numbers[0] = 30 # the first element of the list will be changed to 30, and the list will look like [30, 15, 20, 25].

Adding an element to a list:

list_of_numbers.append(40)

Getting the length of a list:

length = len(list_of_numbers)

Functions

A function is a named section of a program that performs a specific task

Defining a function

```
def printMyName(name):
    print "My name is", name

printMyName("Bob")
# "My name is Bob"
```

```
print "Bob"
print "Charlie"
print "Clara"
print "John"
print "James"
print "Ted"
print "Alex"
-----------------------------------
def printNames(list_of_names):
        for name in list_of_names:
                print name

names = ["Bob", "Charlie", "Clara",
"John", "James",  "Ted", "Alex"]
printNames(names)
```

Functions that return values

```
def addFive(num):
        return num + 5

x = 10
y = addFive(x)
print y
# 15
```