Introduction to Computer Programming

CMP 201 (2019/2020)

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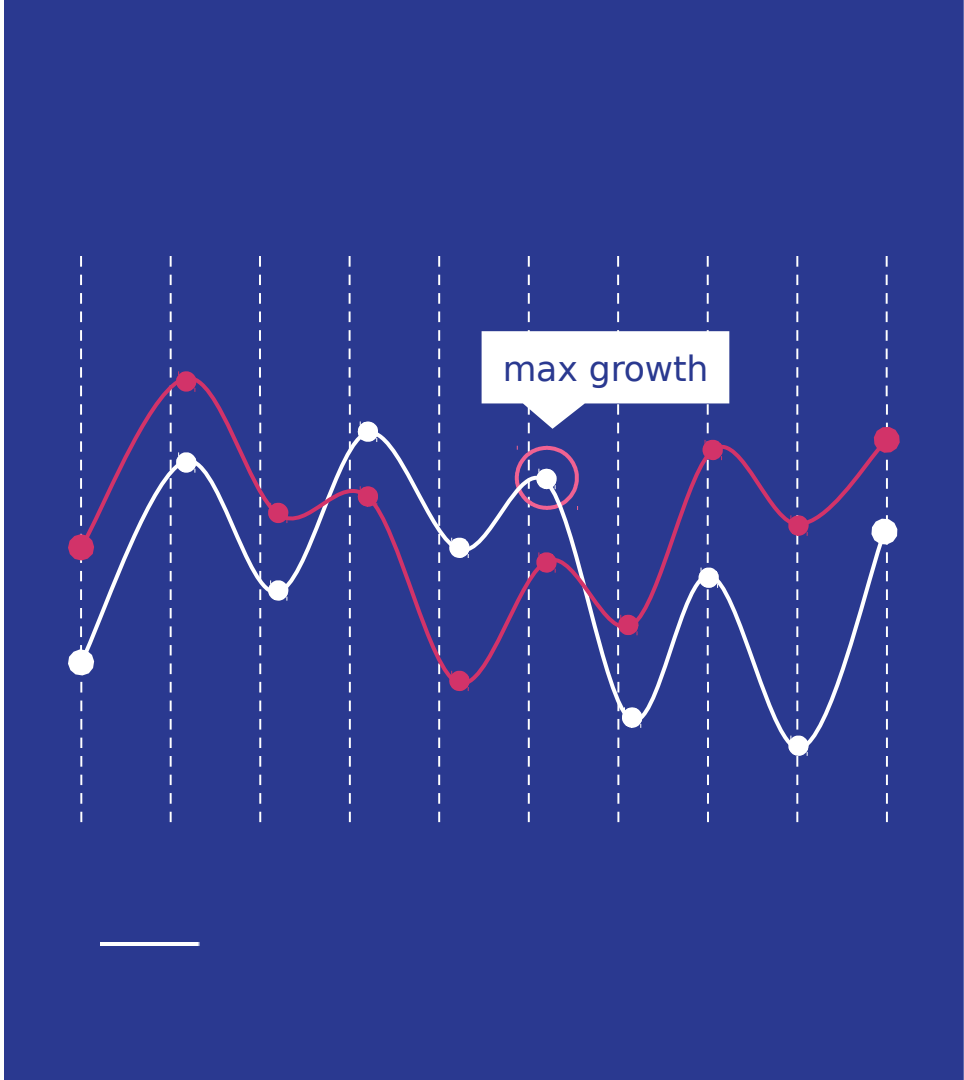


LESSON 2:
Be a Ninja Coder!

Objectives

The aim of this lesson is to build on the foundational knowledge given to the students in the first lecture.

Content(Week 1)

- **Variables** 
- Numbers
- Strings

Variable Names

A variable can have short names (such as x or y) or a more descriptive name (area, age, school).

Rules for Python Variables:

- A variable name must start with a letter or the underscore character.

- A variable name cannot start with a number.

Rules for Python Variables:

- A variable name can only contain alpha-numeric characters and underscores (A-z, 0-8 and _)

- Variable names are case-sensitive (school, School and SCHOOL are three different variables)

Assign Value to Variables:

Python allows you to assign a value to a variable using the assignment operator (=):

Example:

```
x= 34
Age=13
print ( x )
print ( age )
```

PUZZLE:

```
x= 50/5

b= x*3

X=5

print (b)

print (x)
```

Assign Value to Multiple Variables:

Python allows you to assign values to multiple variables in one line:

Example:

```
x, y, z = "Orange", "Banana", "Cherry"

print ( x )
print ( y )
print ( z )
```

Assign Value to Multiple Variables:

You can also assign the same value to multiple variables in one line:

Example:

```
x=y=z = “Banana“

print ( x )
print ( y )
print ( z )
```

Joining String variables

You can combine both text and a variable. Python uses the + character to achieve this:

Example:

```
x = “Awesome“

print ( “Python is ”+ x )
```

Joining String variables

The + character can also be used to add a variable to another variable:

Example:

```
a = “Python is”
x = “Awesome“

print ( a+ x )
```

Joining String variables

NOTE : Combining a string and a number with the + character will produce an error:

Example:

```
a = “Python is”
x = 20

print ( a+ x ) #error
```

Getting input from users:

We are able ask the user for input via the input()

```
print("Enter your name:")
x = input()
print("Hello ", x)
```

Python Numbers:

There are 3 numeric types in Python:

- int
- float
- complex

Python Numbers - Int:

Int, or integer, is a whole number, positive or negative, without decimals, of unlimited length:

Examples include : 1, 2,356777, 9000

```
x= 25
y= 1
z= -329000
```

Python Numbers - Float:

Float, or "floating point number" is a number, positive or negative, containing one or more decimals:

Examples include : 3.142, 90.344, 20.0

```
x = 1.10
y = 1.0
z = -35.59
print ( type  ( x ))
print ( type  ( y ))
```

Python Numbers - Float:

Float can also be scientific numbers with an "e" to indicate the power of 10.:

```
Examples include : 23e3, 12E5
x = 35e3
y = 12E4
z = -87.7e100
print ( type  ( y ))
print ( type  ( x ))
```

Python Numbers - Complex:

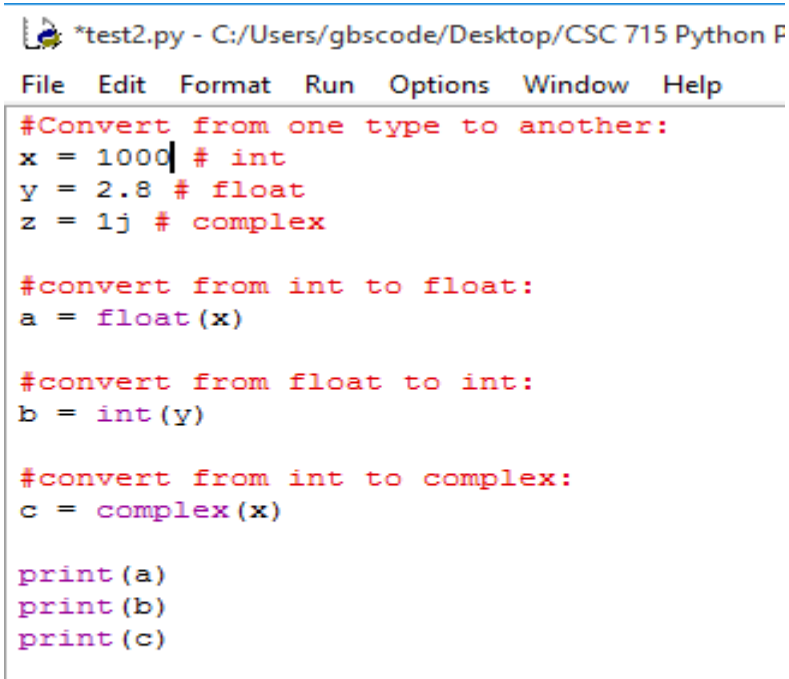
Complex numbers are written with a "j" as the imaginary part:

Examples include : 4j, -9j

```
x = 3+5j
y = 5j
z = -5j
print ( type  ( x ))
print ( type  ( x ))
```

Type Conversion:

You can convert from one type to another with the int(), float(),and complex() methods:

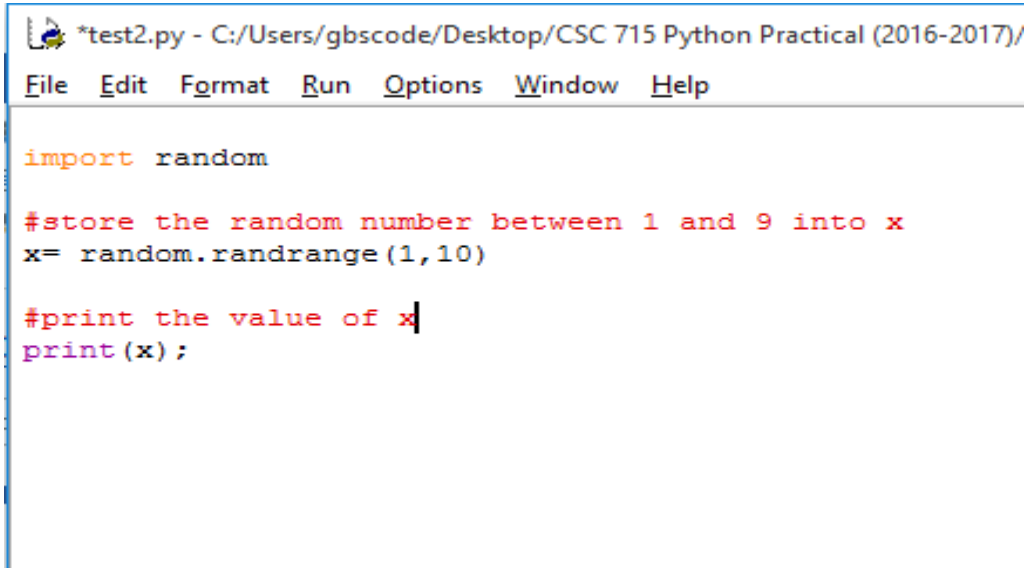


Random Number:

Python has a built-in module called random that can be used to make random numbers:

We can use it by Importing the random module

Random Number:



Content(Week 1)

- **Variables** ✓
- **Numbers** ✓
- Strings

Python Strings:

String literals in python are surrounded by either single quotation marks, or double quotation marks. 'hello' is the same as "hello".

Assigning a string to a variable is done with the variable name followed by an equal sign and the string:

Example

name = “John Smith”

age= “ten years old”

height= “5.7”

PUZZLE:

x= “girl“

print (x[1])

PUZZLE:

a= “fine“

b= “boy“

print (a+b) 

PUZZLE:

x= “silent“

print (x[2]+ x[1]+ x[0]+ x[5]+ x[3]+ x[4])

PUZZLE:

```
x= “galaxy“
print (  len(x)  )
```

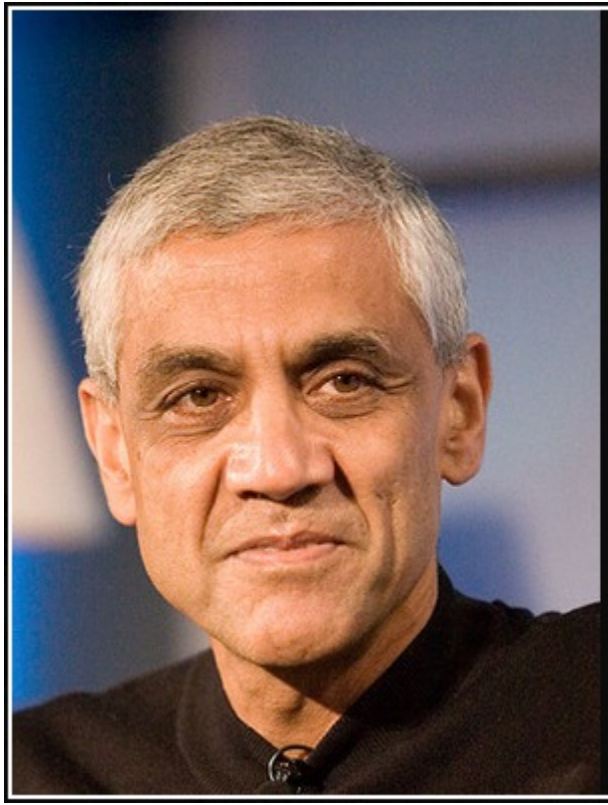
PUZZLE:

```
print (  3 * ‘un’ + ‘ium’  )
```

EXERCISE

(Uniqueness in code earns extra credit).

1. **Each question should be kept in a single .py file**
2. **then all zipped in a file**
3. **with your matric No. as name of the file**



Doctors can be replaced by software – 80% of them can. I'd much rather have a good machine learning system diagnose my disease than the median or average doctor.

— Vinod Khosla —

AZ QUOTES