Introduction to Computer Programming

Exercise 1: Variable

In [ ]:

```
# This is a comment it allows you to anotate the code and is ignored by the compiler
import math #importing the math library
```

1.

In [31]:

```
x = 10 # variable assignement
y = 5
x, y
```

Out[31]:

```
(10, 5)
```

2

In [32]:

```
x = 4
x
```

Out[32]:

```
4
```

Notice the original value of x is changed

3

In [33]:

```
True = 1
```

```
  File "<ipython-input-33-1598b51f0f76>", line 1
    True = 1
    ^
SyntaxError: cannot assign to True
```

In [34]:

```
true = 1
print(true)
```

```
1
```

True is reserved by python for boolean. True and cannot be used as a variable name try: help("keywords") for a list of keywords

4

In [35]:

```
x, y, z = 5, 10, 15
```

Exercise 2: Numbers and Operators

1,2,3,4

In [36]:

```
#Defining two vairables A and B
A = 12
B = 4
print("A+B =",A+B)
print("A*(A+B) =",A*(A+B))
print("A*A+B =",A*A+B)
```

```
A+B = 16
A*(A+B) = 192
A*A+B = 148
```

5

In [37]:

```
A, B = 10, 3
print("A/B =", A/B)
print("A//B =", A//B) #This operation is floor division
```

```
A/B = 3.3333333333333335
A//B = 3
```

6

In [38]:

```
print("A%B = ", A%B)
print("This is the modulus operation")
```

```
A%B =  1
This is the modulus operation
```

For the circle circumference please use the $2\pi R$ formula using math.pi for π

Exercise 3

1,2,3

In [39]:

```
A = "Hello"
B = "World"
print(A+B)
```

```
HelloWorld
```

This concatenated strings A and B. Notice the missing space

4

In [40]:

```
A-B
```

```
---------------------------------------------------------------------------
-
TypeError                                 Traceback (most recent call las
t)
<ipython-input-40-ca2486c81344> in <module>
----> 1 A-B

TypeError: unsupported operand type(s) for -: 'str' and 'str'
```

5,6,7

In [41]:

```
C = A + " " + B
print("The string C contains:",C)
print("The length of C is:",len(C))
```

```
The string C contains: Hello World
The length of C is: 11
```

len works on lists, a string is a list of characters, notice how the space also counts as one.

8

In [42]:

```
print("w" in C)
print("hello" in C)
print("Hello" in C)
print("world" not in C)
print(A in C)
```

```
False
False
True
True
True
```

Notice how this is case sensitive, as you can see "hello" is not in C but "Hello" is.
Regarding the last one A in C as we are referring to the variable A which C is constructed from

Exercise 4: Booleans

1,2

In [43]:

```
A, B = 10,5
print(A<B)
print(A>B)
print(A == B)
```

```
False
True
False
```

The result is in boolean, booleans are used to represent logical expression

3

In [44]:

```
A = B
print(A)
```

```
5
```

The "=" sign represents assignment and not equality. We have now changed the value of A from 10 to 5

5,6,7

In [45]:

```
A = True
B = False # We are assigning boolean values to A and B
```

In [46]:

```
print("A and B:", A and B)
print("A or B:", A or B)
print("A and not B:",A and not B)
```

```
A and B: False
A or B: True
A and not B: True
```

In [47]:

```
#Here's how you can use bool() to evaluate the formula
bool(A and B)
```

Out[47]:

```
False
```