IT-Midterm Study guideline for grade 10

The exam will be **completely written includes these python topics:**

1-Arrays: You should know how to declare an array and fill it, loop through it, and deal with all its functions (append, clear, reverse, pop, remove …).

2- Python Classes/Objects: You should know how to create class, and object from this class, and how to access what is inside the class via the object.

Types of questions: **Tick True or False, Fill in the blank, match and write code.**

Why Python?

- Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc).
- Python has a simple syntax similar to the English language.
- Python has syntax that allows developers to write programs with fewer lines than some other programming languages.

Python Conditions and If statements

Python supports the usual logical conditions from mathematics:

- Equals: a == b
- Not Equals: a != b
- Less than: a < b
- Less than or equal to: a <= b
- Greater than: a > b
- Greater than or equal to: a >= b

Arrays in Python

What is an Array?

An array is a special variable, which can hold more than one value at a time.
If you have a list of items (a list of car names, for example), storing the cars in single variables could look like this:

```
car1 = "Ford"
car2 = "Volvo"
car3 = "BMW"
```

However, what if you want to loop through the cars and find a specific one? And what if you had not 3 cars, but 300?

The solution is an array!

An array can hold many values under a single name, and you can access the values by referring to an index number.

```
cars = ["Ford", "Volvo", "BMW"]
```

Access the Elements of an Array

Get the value of the first array item:

```
cars = ["Ford", "Volvo", "BMW"]

x = cars[0]

print(x)
```

The Length of an Array

use the len() method to return the length of an array (the number of elements in an array).

Return the number of elements in the cars array:

```
cars = ["Ford", "Volvo", "BMW"]

x = len(cars)

print(x)
```

Looping Array Elements

You can use the for in loop to loop through all the elements of an array.

Print each item in the cars array:

```
cars = ["Ford", "Volvo", "BMW"]

for x in cars:
  print(x)
```

Adding Array Elements

You can use the append() method to add an element to an array.

```
cars = ["Ford", "Volvo", "BMW"]

cars.append("Honda")

print(cars)
```

Removing Array Elements

You can use the pop() method to remove an element from the array.

Delete the second element of the cars array:

```
cars = ["Ford", "Volvo", "BMW"]

cars.pop(1)

print(cars)
```

Removing Array Elements

You can also use the remove() method to remove an element from the array.

Delete the element that has the value "Volvo":

```
cars = ["Ford", "Volvo", "BMW"]

cars.remove("Volvo")

print(cars)
```

Note: **remove() method only removes the first occurrence of the specified value.**

Array methods:

Method	Description
append()	Adds an element at the end of the list
clear()	Removes all the elements from the list
copy()	Returns a copy of the list
pop()	Removes the element at the specified position
remove()	Removes the first item with the specified value
reverse()	Reverses the order of the list
sort()	Sorts the list

Python Classes/Objects

Python is an object oriented programming language.

Almost everything in Python is an object, with its properties and methods.

Create a Class

To create a class, use the keyword class:

Create a class named MyClass, with a property named x:

```
class MyClass:
  x = 5
```

Python Classes/Objects

Create Object

Now we can use the class named MyClass to create objects:

```
class MyClass:
  x = 5
```

Create an object named p1, and print the value of x:

```
p1 = MyClass()
print(p1.x)
```