

OCR GCSE – Computer Science

Summer Project

- 1. Python Coding Recap**
- 2. Emerging Technology Research**
- 3. Careers in Computing**
- 4. Invention**
- 5. Extension Task**

Task 1 – use the website Repl.it OR download Python to your computer

Recap the basics of python: Printing, Getting Data, and variable types.

- (1) Printing.
- (2) Getting input from the user.
- (3) Integers and float numbers.



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(0) comments

```
# this is a comment
```

A program runs line by line. A line starting with # in python is just a comment to help the programmer follow what is going. You are encouraged to insert timely comments in your programs.

(1) Printing

command: print

usage: normal quotes “ ” or single quotes ‘ ’. Try typing this on the command line

```
>>> print "hello world"
hello world
>>> print 'I am a python programmer'
I am a python programmer
>>>
```

(2) User input

Commands: input and raw_input



Try this example:

```
name=raw_input("input your name ")
age=input("input your age ")

# you can print variables as follows separate variables using commas
print name, age

#also separate text in quotes

print "my name is ",name,"and I am ",age," years old"
```

(i)The name typed by the user is stored in the variable name. The number typed in by the user is stored in the variable age.

(ii)For text you need to use raw_input and for numbers you can use either type of input.

Variables and number are stored in the computer's memory. In principle you can create as many variables as you like, however in practice the size of the computer's memory limits the number of variables. This used to be important for the computers during the 1980, but nowadays it is not an issue.

Exercise 1

Write a program that prints "hello world it is sunny today" three times.

Exercise 2

Write a program where the user inputs their nickname, shoe size, and birth location. The computer prints out a sentence on the person's nickname, shoe size, and birth location.

(3) Integer and float numbers

Integers are whole numbers and floats are numbers with decimal places. In most situations one uses floats, but integers are less memory intensive. Basic maths operations:

Operator	Description
+ plus	Sum
- minus	Subtraction
/ slash	Floor division
* asterisk	Multiplication
** double asterisk	Exponentiation
% percent	Remainder
< less-than	Comparison
> greater-than	Comparison
<= less-than-equal	Comparison
>= greater-than-equal	Comparison



You can use the above for integers or floats. But operations involving only integers ignores decimal places.

Experiment 1

Experimenting is often the best way to know how a python operation works

Type in the program in a file and run using F5

```
a=5
a=10
a=15

print a
```



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What do you expect the output to be?

You should find that the output is the last defined value of a. The value of a is stored in memory. The value of a is updated every time a line contains a=. The last value of a is printed.

Experiment 2

Double the value of a. Run this and see what happens

```
a=5
print a
a=a*2
print a
```

The third line `a=a*2` is unusual. What this means in words “whatever the value of a multiply that number and then store that value in a.

Extension A: replace the 2 with some other integer and run the program.

Extension B: have multiple lines of `a=a*2` before you output the result and note the output.

Have a play around with Python – try divide / add + subtract – see what happens

Task 2) Research an Emerging Technology

There are lots of new technologies coming out – create a factfile on something coming out soon or very recently out. This can be done on paper, recorded as a video or as an audio – I want lots of information about this new technology. BBC Click is worth watching or checking out university research pages to find out the latest!!!



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Task 3) Jobs in Coding

Coders are extremely sought-after people. There are a wide range of IT-related jobs that are in high demand and offer very lucrative salaries.

The top 3 fastest growing jobs predicted for 2020 are:

1. Artificial Intelligence Specialists
2. Robotics Engineers
3. Data Scientists

All these jobs require knowledge of coding. Learning how to code in Python is an excellent starting point for a future pathway into any one of these fields.

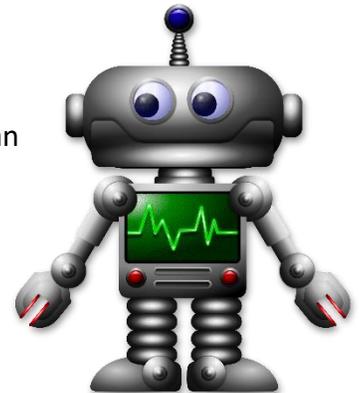


Find out about 1 job role in computing – find out Job Title, Job Description, Skills needed and Salary

Task 4) Invention

You have the opportunity to invent your own creation. You could design an app, create a robot that carries out tasks, is a new wearable technology ANYTHING.

I want a description and a design to show what it would look like – it must be new and not exist already



Extension – there are lots of free opportunities to learn programming languages sign up for free and work at your own pace. If you complete any please show me take some screen shots or photos of your code.

Enjoy !!! Mrs Tait