



GCSE Computer Science

Topic 2.2 Programming (2)

Boolean operators are used to combine **STATEMENTS** and **OPERANDS** which can all be evaluated as True or False.

They allow programs to make decisions and use selection.

AND	<p>Using the AND operator ensures that the overall statement is TRUE only if ALL of the individual statements are True.</p> <p style="text-align: center;">8 == 8 AND 4>2</p>
OR	<p>Using the OR operator ensures that the overall statement is True if ANY of the individual statements are True.</p> <p style="text-align: center;">7 != 2 OR 5==4</p>
NOT	<p>The NOT operator REVERSES the logical state of the other operators.</p> <p style="text-align: center;">NOT (3>2 AND 3!=3)</p> <p><i>Remember the brackets means the equations inside must be evaluated first, then REVERSED using the NOT operator.</i></p>

```
01 myList = openRead("ToDoList.txt")
02 print(myList.readLine())
03 myList.close()
```

```
myList = openWrite("ToDoList.txt")
myList.writeLine("4. Make lunch for parents.")
myList.close()
```

String manipulation: performing operations on string data.

.upper	Changes all characters into UPPER CASE.
.lower	Changes all characters into lower case.
Concatenation (+)	Joins two or more strings together to form a new string.
.length	Returns the number of characters in a string.
Extracting characters using index positions	Extracts single characters from a string using their index numbers. String[i]
Substrings	Extracts a portion of the full string the first number is the string index, the second number is the amount of characters to extract. .substring(a, b)
String traversal	Moving through a string one character at a time; can be used to see if a string contains certain characters.

File handling is all about how a program can access data and change data stored in an external file.

Open	<p>Before you can do anything with a file, you have to open it. This is done using an open command, and assigning the file to a variable.</p> <p>There are two modes in which you can open a file:</p> <ul style="list-style-type: none"> • Open to READ / Open to WRITE <p>Once a file is opened the program will start reading or writing from the beginning. As you read from or write to a file, the program keeps its place in the file (think of it like a cursor)</p>
OpenRead	<p>File=openRead("FileName.txt")</p> <p>Opens the file called FileName.txt in READ MODE and allows you to 'read' (fetch) the data into your program.</p>
OpenWrite	<p>File=openWrite("FileName.txt")</p> <p>Opens the file called FileName.txt in WRITE MODE and allows you to 'write' (add) data from your program into the file.</p>

- You can read lines from a file using the readLine() command.
- You can write lines of text to a file using writeLine().
- * If the file already contains some text then writeLine() will **overwrite** what is currently there.
- endOfFile() returns TRUE when the cursor is at the end of the file. Its main use is to signify when a program should stop reading a file.
- When you finish reading or writing to a file, close it using the File.close() command.

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What I need to know:

Describe what Boolean operators are used for in programming.

Explain, with examples, how the 3 main Boolean operators work.

State the purpose of string manipulation.

Outline the 7 main string manipulation commands and their function.

State what is meant by 'file handling'

Outline how the open command works.

Describe the difference between the openRead and openWrite file handling command.

Describe the function of readline(), writeline() and endoffile() commands.

State which command should be used when you have finished using a file.

Warm-Up

Circle all of the Boolean expressions that are true.

12 > 4 AND 5 == 5

12 <= 4 OR 10 != 5

7 >= 3 AND 91 > 99

NOT(11 == 3)

9 == 8 OR 2 > 16

NOT(9 > 4 AND 5 < 2)

A garden centre has a climate monitoring system that gives warnings if the temperature and humidity aren't at suitable levels. The climate monitoring system contains this algorithm.

```
IF humidity == 50 AND (temperature > 16 AND temperature < 25) THEN
    print("Humidity and temperature at acceptable levels.")
ELSEIF temperature <= 16 OR temperature >= 25 THEN
    print("Warning - Please alter the temperature.")
ELSE
    print("Warning - Please alter the humidity.")
ENDIF
```

a) What will the output be if humidity = 30 and temperature = 16?

..... [1]

b) What will the output be if humidity = 30 and temperature = 20?

..... [1]

Frances has written a list of jobs she has to do and stored it in the ToDoList.txt file shown on the right.

- ```
1. Clean my room.
2. Computer Science homework.
3. Organise my stamp collection.
```

a) Describe what each line of the code below does.

```
01 myList = openRead("ToDoList.txt")
02 print(myList.readLine())
03 myList.close()
```

Line 01 .....

Line 02 .....

Line 03 .....

[3]

Frances writes the following code to add an extra job to the bottom of her list.

```
myList = openWrite("ToDoList.txt")
myList.writeLine("4. Make lunch for parents.")
myList.close()
```

b) Explain why the code Frances has written will not work as intended.

[2]