

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.

$12 > 4 \text{ AND } 5 == 5$ $12 <= 4 \text{ OR } 10 != 5$ $7 >= 3 \text{ AND } 91 > 99$
 $\text{NOT}(11 == 3)$ $9 == 8 \text{ OR } 2 > 16$ $\text{NOT}(9 > 4 \text{ AND } 5 < 2)$

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]