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Aim & Objectives

- Re-cap on previous session
- Explanation of future sessions
- Short sessions with complimentary exercises

Introduction

In the “*foundation*” sessions we will be working on making sure that students (each of you) have a solid base in programming. To do this, we will be re-iterating key concepts and expanding on them.

Exercise - Start Idle

Please start the idle software as you have done before, making sure you start in the right version (3+). It's good practice to manually make sure each time!

Exercise - Representing Data

Please answer these questions on the back of your paper:

- What is RAM?
- How do computers use RAM?
- What is a CPU?
- How does a CPU work?

In this exercise, please show how you represent the following data in computer memory:

- Bit
- Byte
- Integer (int)
- String (str)
- Array (list)

Exercise - Strings

Strings are typically an array of Bytes or Chars, where a Byte is 8 bits and a Char is 16 bits (although variations exist). If we for the moment assume we are using a Byte to represent our files, messages and strings - how do we represent things like newlines, tabs, non-printable characters?

The problem is, we don't have a non-printable key to represents what a newline typically does. Sure we have an enter key but the interesting part is what it does behind the key. The enter key is actually two Bytes! Something call a “*line feed*” and “*carriage return*”. This is back from the days of type writers where putting the “*cursor*” back to the beginning of the line was a separate task to moving it down by a line. Typically this stuck around in computing, along with the “*Qwertyuiop*” keyboards (ever wonder where that came from?).

In decimal, the line feed is a ‘10’ and the carriage return is a ‘13’. Line feed is typically ‘\n’ and carriage return is typically ‘\r’. Because everybody was always having to do ‘\r\n’ all the time and rarely the other type, they changed it to just ‘\’ to save space and time. These are referred to as escape characters.

What do the escape characters do in this list? Write it down on the back and add any others you know.

- \s
- \n
- \r

In a String, sometimes we want to use the character we are using to describe the String inside the String itself. For example:

```
print("Jack said \"Hello\", \"Who are you?\"", "\"I am me!\" the voice replied.")
```

Okay, it's not very readable - but we can sort that. The best thing to do when you don't understand is to break it down! Try underlining all of the pairs escape characters and their pairs.

Exercise - Assignment

Don't worry! It's not coursework. Assignment is when you “*assign*” a value to a unique name. Value is meant vaguely here, as it could be a function, instance, class - anything.

Assign the below values:

- “`Programming wizardry`” to the unique name ‘`cool_var`’
- ‘`-34985134.3432`’ to a unique name ‘`bigNum`’
- ‘`342398534 * 34`’ to a unique name ‘`mathIsCool`’

Resources & Further Reading

‘<http://homepages.herts.ac.uk/~db12aba/>’ - All content from these sessions updated weekly.

‘<http://code.org/>’ - A good resource testing your programming skills.

‘<http://stackoverflow.com/>’ - Highly recommended online help for programmers (NOTE: Employers are interested to know whether you're an active member of this site!).