Revision list for assessment – Paper 2

PAPER TWO:

Definitions:

Decomposition – Breaking a problem down into smaller, solvable problems

Abstraction – Removing unnecessary details

Sanitisation – Cleaning up inputted data

Casting – Converting a data-type from one to another.

Data-types:

String – Text/characters

Integer – Whole numbers (1, 2, 3, 4, etc.)

Float/real – Decimals, e.g. 3.14 or a timer that uses decimal numbers, e.g. 7.3

Boolean – True or false values

High level languages – Written in English for a human to understand, e.g. Python

Assembly language – Uses mnemonics, e.g. INP where the programmer can type each instruction, very close to binary so programmer needs to understand how the underlying hardware works and memorise a huge number of instructions.

Character set – Set of all characters a computer can understand (e.g. using ASCII or UniCode)

E.g. if you had a variable called name and you stored “bob” in it like this using 8-bit ASCII

Name = “bob”

Then b = 10101010   o = 00001111   b = 10101010

Putting it all together would be 1010101000001111101010 to the computer.

Testing

Why test? Testing is carried out to ensure there are no errors/bugs/problems with the program that may cause it to crash or that there are no logic errors that might cause it to behave in unexpected ways. Not testing a program could cause problems such as a company losing money and then suing you for having not tested it properly!

Iterative testing – Testing throughout development

Final testing – A thorough, complete test done at the end of development just before publishing.

Maintainability – Making code more readable so that programmers can edit/improve a program.

- Comments
- Sub-programs
- Sensible variable names
- Use of proper indentation to clearly show separate blocks of code

SQL – The programming language used by database.

E.g. `SELECT * FROM users WHERE name = “Bruce”`

This would return ALL columns from the “users” table where the name column is “Bruce”

E.g. `SELECT name FROM users WHERE age > 17`

This would return only the names of people that were aged greater than 17.

SQLZOO.net is a great place to learn the basics of SQL as is W3 Schools SQL.

Binary to hexadecimal:

Easy method

1110 0011 in hexadecimal?

Write out…

10 = A, 11 = B, 12 = C, 13 = D, 14 = E, 15 = F

Then

8	**4**	**2**	**1**
1	1	1	0

= 14

8	**4**	**2**	**1**
0	0	1	1

= 3

That is E3 in hexadecimal

Also practise denary to binary!

Programming maths:

DIV means “integer division”. For example 7 DIV 2 = 3 (it cuts off the .5)

MOD only gives the remainder. E.g. 7 MOD 2 = 1 (because the remainder is 1)

Right shifts, e.g. 11001000 shifting 2 places to the right (→) becomes:

00110010 (it halves it and halves it again!)

Each shift right → will halve it.

Each shift left ← would double it.

Revise logic gates and truth tables from Boolean expressions…

e.g. make sure you can draw a logic diagram from P = A OR (B AND C)

Remember, the BRACKETS are done first, think BIDMAS!!!

Images

Resolution – The number of pixels in an AREA of an image.

Colour depth – The number of colours that can be represented.

E.g. 000 = Black, 001 = Green, etc…

Remember, with 2-bits, you can represent 4 colours. Think powers of 2

Metadata – Data ABOUT the file, e.g. file-type, size, date created.

Compression:

Lossy – Permanently removes data to make an image smaller

Lossless – Identifies repeating patterns and is reversible.

Algorithms and programming:

Insertion sort – Ensure that you revise the steps of an insertion sort on words.

E.g. sort [“Eddie”, “Arnold”, “Zeus”, “Steve”, “Sarah”, “Alan”, “Bruce”]

Ensure you can write and interpret pseudocode algorithms.

Particularly revise ARRAYS and how to output data/elements from arrays.