# Year 11 into 12 – Computer Science Transition work

* 1. Compare the use of **variables** and **constants** in a computer program, giving one similarity and one difference.

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* 1. A programmer creates the following code:

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|  | 01 input y  02 x = y MOD 5  03 if x == 0 then  04 print “True”  05 end if |  |

How is the = sign on line 02 and line 03 used differently?

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ii. What is one input that would case the program to output **True** and explain why this is the case?

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What are **two** basic programming constructs that have been used in the code above?

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What is the name of **one** programming construct that has **not** been used in the code above and give an example of how this construct could be used?

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1. Create an algorithm that will allow the user to enter a word and then count how many times the letter A appears in that word. Both upper case (“A”) and lower case (“a”) letters must be counted. The algorithm should repeat until a word is entered that has 3 or more letter As.

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* 1. The following algorithm prints out the times table of the number entered using a **count controlled** loop.

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|  | 01 input b  02 for x = 1 to 100  03 print b \* x  04 next |  |

Rewrite the algorithm to produce the same result using a **condition controlled** loop.

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* 1. Write an algorithm that will ask the user for their age (in years) and then print the message “happy birthday” that many times.

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* 1. Complete the data type column on the below table to show the **most appropriate** data type for each:

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| **Data recorded** | **Example data** | **Data type** |
| Number of goals scored | 2 |  |
| Training venue | Bycars Park |  |
| Session completed (True / False) | True |  |
| Best sprint time (seconds) | 12.7 |  |

* 1. What is meant by the term **casting** in relation to data types?

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* 1. The data from part (a) is stored in an array called trainingdata*.* The training sessions are stored in a text file called allsessions.txt

Complete the algorithm below to add the new trainingdata to the text file.

**trainingdata = [2, “Bycars Park”, True, 12.7]**

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* 1. Using the trainingdata array from the previous question, give the pseudocode that a programmer would use to output just the training venue details(“Bycars Park”) from this array. You may assume that the array is zero-indexed.

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* 1. How could a 2 dimensional array be used to allow a programmer to hold details of multiple training sessions?

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* 1. A database table called *songs* is used to store details of music that is played on an Internet radio station.

The *songs* table is shown below

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| **MusicID** | **BandName** | **SongTitle** | **Length** | **Fade** |
| 0001 | Penguin Steak | Along The Way | 3.27 | False |
| 0002 | Faustus | Round At Jessica’s | 2.55 | False |
| 0003 | Scholar Green | The Mule | 3.12 | True |
| 0004 | Penguin Steak | Insomnia | 3.06 | False |
| 0005 | Faustus | The Last Train Home | 4.19 | False |
| 0006 | Elvis Fontenot | Dear Love | 4.07 | True |

What is meant by the term **database** **record**?

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* 1. Write SQL statements to display the following data from the *songs* table:

1. Show the SongTitle and Length for all songs by the band Penguin Steak

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1. Show the SongTitle for all songs that are over 3 minutes in length.

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* 1. Procedures and functions are both examples of subroutines. What are two advantages of producing modular code using subroutines?

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1. What **two** ways in which procedures differ from functions?

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1. **i.** A password must have at least 8 characters to be valid.

Using pseudocode, create a function which will accept a password string as a parameter passed into the function, returning True if the password is a valid length or False if it is not valid.

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**c ii.** Use the function defined in part (i) above to check whether “HELLO123” is a valid password, printing out True or False as appropriate. **You must use the function defined in part (i).**

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