# Homework 1 Arrays, tuples and records

# 1. Trace through the following pseudocode and complete the trace table below.

# 

# maxAge = 0

# array ageList[4]

# for index = 0 to 3

# ageList[index] = input ()

# if ageList[index] > maxAge then

# maxAge = ageList[index]

# position = index

# endif

# next index

# print (AgeList[position], position)

# Test Data 12, 16, 17, 11

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **ageList** | | | |  |  |  |
| **index** | **0** | **1** | **2** | **3** | **maxAge** | **position** | **Output** |
|  |  |  |  |  | 0 |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

[4]

2. A teacher uses a program to store an array of 20 pupils pupil[0:19] she would like to sort them into two groups for a group activity. Write a pseudocode algorithm that will read the 20 names and then output lists consisting of every other pupil.

Example: GROUP 1

pupil1

pupil3

pupil5

GROUP 2

pupil2

pupil4

pupil6 [5]

3. (a) The results of an Athletics event involving several schools are recorded. An array **school[0:3]** holds the names of the 4 schools participating. A second array **medal[0:3]** holds the number of medals that each school has won. This array is updated each time a new result is announced.

For test purposes, the names of the schools are recorded as AAAA, BBBB, CCCC, DDDD. The medal array is pre-loaded with results [4,7,1,3], meaning that school AAAA has 4 medals, BBBB has 7 medals, etc.

Each time a new result comes in, the user enters the result. They are prompted to enter the school number (1 for AAAA, 2 for BBBB etc.) and the medal array is updated.

When the user enters -1 for the school number, the results are printed in the form

**School number nn School name XXXX Number of medals nn**

Complete the pseudocode for this program. Include validation to ensure that a valid school number is entered. [8]

school = ["AAAA", "BBBB","CCCC","DDDD"]

medal = [4,7,1,3]

(b) It is possible to have an n-dimensional array holding a set of elements of the same type. Give an example of a program where it might be useful to use a multi-dimensional array. How many dimensions would this array need? [2]

(c) Give **one** difference between the data structures **array** and **tuple**. [1]

[Total 20 Marks]