Name: Class:

Task 1

1. Julie has collected data on the average monthly temperatures for each month of the year. She is writing a program to print these out in a list, e.g.

January 15.0

February 13.8

March 16.5

etc.

The start of her program defines an array called month and initialises it.

array month[12]  
month = ["January", "February", "March", "April”, "May", "June", "July",   
 "August", "September", "October", "November", "December"]

She wants to allow the user to input the monthly temperatures into an array temperature which has length 12.

Write pseudocode for inputting the data in Julie’s program, prompting the user with statements such as "Enter temperature for January: ", "Enter temperature for February: ", etc., and then prints the data, giving the month and temperature for each month.

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2. Write pseudocode to input the monthly rainfall for each month from January to December into an array and print:

* a list of each month’s rainfall
* the total annual rainfall to one decimal place
* the monthly average over a year
* the number of months that have rainfall above the average value

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Task 2

The simplest (and slowest) method of sorting an array of values into alphabetical or numerical sequence is the **Bubble Sort**. It works like this:

Suppose you have an array of 6 usernames: Carl, Tasmin, Eric, Zoe, Alan and Mark.

Go through the list, comparing each name with the one next to it. If it is greater, swap them.

After going through the list once, it looks like this: Carl, Eric, Tamsin, Alan, Mark, Zoe.

The last element of the array is now in the correct place.

(i) Repeat the operation on the first 5 names. What is the order now?

(ii) Show the order of the names after each further pass through the array until the names are sorted.

The pseudocode algorithm is:

userName = ["Carl","Tamsin","Eric","Zoe","Alan","Mark"]

numItems = userName.length

for i = 0 to numItems - 2

for j = 0 to numItems – i - 2

if userName[j] > userName[j+1] then

*Swap the names in the array*

endif

next j

next i

(iii) Write pseudocode statements to replace the statement *Swap the names in the array* to show how this operation will be performed.

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Task 3

Write pseudocode for a program to do the following:

For each of three students

* Input the name of the student into an array   
  array name[3]
* Input five marks for the student into a 2-dimensional array  
  array marks[3,5]
* Calculate and output the student’s total and the average mark

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