Sri Lanka Institute of Information Technology
Assignment

Due Date: 12th May 2017

TABLE MANIPULATION

This problem is an exercise in organizing a one-dimensional list of numbers into a 2-dimensional table with a variable number of columns. The numbers must be organized into a table which reads by columns, left to right. The lengths of the columns should be balanced so that all rows except the last are filled. The empty spaces in the last row should be at the right end of the row.

EXAMPLE:

LIST: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

COLUMNS: 5

TABLE:

1	5	9	12	15
2	6	10	13	16
3	7	11	14	17
4	8			

Write a program to read a collection of records (< 10,000) each with a positive integer in columns 1-5. A zero value terminates the list. A second set of records should be read next, with various positive integer values for C, the number of columns, in columns 1-5. After each value of C is read, the sum of the elements in each row of the table should be computed and printed. Sums will be less than 9 digits. The 2-dimensional table itself should not be printed.

Using the sample data shown above for various values of C, output similar to the following should be produced:

```
C    ROW SUMS

5    42 47 52 12
************************************
1    153
************************************
2    11 13 15 17 19 21 23 25 9
************************************
```

Either vertical or horizontal printing of row sums is acceptable, but a line of asterisks should separate output generated for different values of C. A zero value for C should cause the program to terminate.

Source: ACM NATIONAL SCOLOSTIC PROGRAMMING CONTEST

Instruction for submission and demonstration

Write an algorithm in pseudocode to solve the above problem. You can implement the algorithm using any language.

You should include:

1. A printout of all source code for the programs with proper in-line documentation.
2. Description for any cases for which your program is not working correctly.
3. Sample inputs and outputs from your running programs.

Your submission must have a cover page, which must include:

1. The words "Design and Analysis of Algorithms IT240".
2. Your name and IT number.
3. A signed statement that the assignment is your own work.

3. Put all your source code in directory with your IT number. The soft-copy of your assignments should be uploaded to the course web on the specified due date for the assignment. **Late assignments will not be accepted.**
4. Due dates and other arrangements may only be altered with the consent of the majority of the students enrolled in the unit and with the consent of the lecturer.
5. Demonstration requirements:
    1. You may be required demonstrate your working program and/or sitting in a quiz during practical sessions.
    2. The source code MUST be that submitted.
    3. The programs should run on the department's machines.

Failure to meet the above-mentioned requirements will result in the fail the subject.