

Due on Wednesday, Feb 24, 2010

Each student is required to do this assignment **individually**. Type all of your answers in an electronic file (you can use plain text or Microsoft Word), which includes your explanation and data of inputs and output. All computer programs should be saved in separated files. Send your answer sheet and program files to the course email account:

`cs0411@peace.lakeheadu.ca`

In the email, you should indicate your name, student ID, assignment number and a list of attachments. All the program files should be sent as attachments of the email.

Assignments which do not meet above requirement risk reduced marks or even no marks.

The grade of the assignment will depend on:

Documentation and readability: 20 %

Correctness: 80 %

Problem 1.

Write a function subprogram which calculates the sum

$$Sum = \sum_{i=1}^n i.$$

Then use this function to compute the following value:

$$y = \frac{(1 + 2 + 3) + (1 + 2 + 3 + 4) + (1 + 2 + 3 + 4 + 5)}{(1 + 2 + 3 + 4 + 5 + 6) + (1 + 2 + 3 + 4 + 5 + 6 + 7)}$$

Problem 2.

Suppose R is the radius of base of a cylinder and h is the altitude of that cylinder. Then the volume of the cylinder

$$V = \pi R^2 h.$$

Write a function which reads the values of R , h and computes the volume of the cylinder.

Then write a Fortran program which reads the data from a file `file1.dat` and writes the values of volumes into a file called `volumes.dat`. The content of `file1.dat` is as follows:

```
23.00 12.00
 3.00 43.00
67.80 23.00
 2.00  3.00
 4.00  6.00
 5.00 75.00
 3.00 45.00
67.00  0.70
 5.78 45.00
23.00 14.00
```

where each line is a pair of values (R, h) . This file can be found at the course webpage:

<http://peace.lakeheadu.ca/cs0411.html>

Print out the file `volumes.dat`. It should look like:

```
  R      h      volume
23.00 12.00 ****.**
 3.00 43.00
67.80 23.00
 2.00  3.00
 4.00  6.00
 5.00 75.00
 3.00 45.00
67.00  0.70
 5.78 45.00
23.00 14.00
```