

# Data Structures and Algorithms IT2070

Year two Semester two 2020

Online Examination

Sri Lanka Institute of Information Technology

Time: 30 minutes

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## Paper Number 6 (20 marks)

The sum of the  $n$  cubes numbers are given by the following formula:

$$1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{n^2(n+1)^2}{4}$$

A recursive algorithm for the sum of first  $n$  cube calculation is given below:

<b>Algorithm 1</b> Algorithm $S(n)$
1: //Input: A positive integer $n$
2: //Output: The sum of the first $n$ cubes
3: <b>if</b> $n = 1$ <b>then</b>
4: <b>return</b> 1
5: <b>else</b>
6: <b>return</b> $[S(n - 1) + n * n * n]$

- Write a program in Python to read an integer from the keyboard for  $n$ .
- Develop a function in python named as sumcube and implement the above recursive algorithm.
- Pass the input numbers as parameter to the function developed and get the sum of cubes of number as output.
- Use the loop to run the program and display the correct output until user inputs -1

**Upload your answer using given template to the course web link “Paper Number 6”**

## Grading Sheet:

- 1) Program is compiling. **2 marks**
- 2) Program is running successfully. **2 marks**
- 3) Program takes the input number as integer. **2 marks**
- 4) Correct implementation sumcube function. **6 marks**
- 5) Display the output correctly **2 marks**
- 6) Use of loop correctly **4 marks**
- 7) Include comments and properly indented. **2 marks**
- 8) Plagiarism testing tool results:.....

