

Homework #3

Due: February 6, 2012

Points: 100

For this homework, please put refinements for your program into a file called “refinements.txt” or “refinements.pdf”, and error journal entries for your program into a file called “errors.txt” or “errors.pdf”.

1. (*100 points*) Write a program to compute the sum of the first n cubes (that is, each number from 1 to n raised to the third power, and the powers summed). Prompt the user to input n . Please do three versions of the program.

- (a) (*50 points*) In the first version, you may assume that the user will enter a non-negative number. Your output is to be:

```
Enter the number of cubes to sum: 10,
The sum of the first 10 cubes is 3025
```

(The number in italics is what the user types; you are not to print it in italics, because the Python interpreter will echo it. Also, the “,” simply indicates pressing ENTER or RETURN; you are not to print that, either.) Turn in your program in the file “sumcubesa.py”.

- (b) (*25 points*) In the second version, you may assume that the user will enter a number, but it may be negative. If it is, you are to print

```
You entered a negative number; you must enter a non-negative number
instead of the second line. Turn in your program in the file “sumcubesb.py”.
```

- (c) (*25 points*) In the third version, you may not assume the user will enter a number. If they do not enter a number, you are to print

```
You did not enter a number; you must enter a non-negative number
instead of the second line. Turn in your program in the file “sumcubesc.py”.
```

Extra Credit: (*30 points*) Recall the formula for the solutions to a quadratic equation $y = ax^2 + bx + c$ is:

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

and

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Write a program that reads in a , b , and c , checks that they are numbers, checks that $b^2 - 4ac$ is non-negative, and then computes the two roots. If any of the inputs are not numbers, or $b^2 - 4ac$ is negative, report an error and stop.

Important Note: Submit this program in the Extra Credit 3 area of SmartSite—not in the Homework 3 area.