### SIENA COLLEGE

**24th Annual**

### High School Programming Contest

##### April 8, 2011

###### **Problem #1: The Sum of Perfect Squares**

Background Information: If you look at the simplest examples of sums of perfect squares you may notice a pattern.

12 = 1

12 + 22 = 5

12 + 22 + 32 = 14

12 + 22 + 32 + 42 = 30

12 + 22 + 32 + 42 + 52 = 55

and

1 = (1) (2) (3) / 6

5 = (2) (3) (5) / 6

14 = (3) (4) (7) / 6

30 = (4) (5) (9) / 6

55 = (5) (6) (11) / 6

so we may conjecture that 12 + 22 + 32 + … (N – 1)2 + N2 = N (N + 1) (2N + 1) / 6.

It can be proved that this is indeed true for all positive integers N.

###### Programming Problem:

Input: A positive integer N < 1000.

Output: The sum of the first N perfect squares.

###### Example 1: Input: 1

###### Output: 1

###### Example 2: Input: 5

###### Output: 55

Example 3: Input: 100

Output: 338350