CS205 C/ C++ Programming - Lab Assignment Template

Name: 中文名(PIN Yin)

SID: 11X1XXXX

Part 1 - Analysis

In this part, you should present how you analyze the problem and list basic steps to show how the problem is solved.

You can list libraries, techniques and algorithms you use in this program and even some mathematical equations.

Example: Sum the square from 1 to N, N will be given from stdin.

The problem is to calculate $\sum_{i=1}^N i^2$, traditionally, we can use a loop to calculate item by item, but we can do that in an efficient way.

$$\sum_{i=1}^{N}i^2=rac{N(N+1)(2N+1)}{6}$$

Part 2 - Code

```
#include <stdio.h>

int main(int argc, char const *argv[])
{
    long long n;
    scanf("%lld", &n);
    if(n <= 0)
    {
        fprintf(stderr, "N must larger than 0\n");
        return 1;
    }
    long long result = n * (n + 1) * (2 * n + 1) / 6;
    printf("%lld\n", result);
    return 0;
}</pre>
```

Part 3 - Result & Verification

In this part, you should present the result of your program by listing the output of test cases and optionally add a screen-shot of the result.

Test case #1:

```
Input: -1
Output: N must larger than 0
```

Test case #2:

```
Input: 10
Output: 385
```

Part 4 - Difficulties & Solutions

Using an int to store the result may sometimes cause an overflow, so long long is used.