

```
1  #include <iostream>
2  #include <cmath>
3  #include "Assignment2-Header.h"
4
5
6  using namespace std;
7
8
9  ///////////////////////////////////////////////////////////////////
10 //      Assignment 2.1 - Gaussian Sum: sum of the first n integers
11 ///////////////////////////////////////////////////////////////////
12
13 // Of course there's the Gauss formula to compute the sum of the first
14 // n integers but the point of this assignment is to show loops.
15
16
17 int Gaussian(unsigned n) {
18     unsigned tot = 0;
19     while (n > 0) {
20         tot += n;
21         n--;
22     }
23     return tot;
24 }
25
26
27
28
29
30
31 ///////////////////////////////////////////////////////////////////
32 // Assignment 2.2 - Another Sum: sum of the even number between 0 and n
33 ///////////////////////////////////////////////////////////////////
34
35
36 int Another(unsigned n) {
37     unsigned tot = 0;
38     while (n > 0) {
39         if (n % 2 == 0)
40             tot += n;
41         n--;
42     }
43     return tot;
44 }
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59 ///////////////////////////////////////////////////////////////////
60 //          Assignment 2.3 - Prime Factorization
61 ///////////////////////////////////////////////////////////////////
62
63 // Looping
64
65 void decomp(int n) {
66     int i = 0;
67     while (n != 1) {
68         for (i = 2; i <= n; i++) {
69             if (n % i == 0) {
70                 n /= i;
71                 if (n != 1) {
72                     cout << i << " * ";
73                     break;
74                 }
75                 else {
76                     cout << i << endl;
77                     return;
78                 }
79             }
80         }
81     }
82 }
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92
93 // Recursive
94
95 void decompRec(int x, int d) {
96     if (x != d) {
97         if (x % d == 0) {
98             cout << d << " * ";
99             decompRec(x / d, d);
100         }
101         else {
102             d++;
103             decompRec(x, d);
104         }
105     }
106     else
107         cout << d;
108 }
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```

```
117 //////////////////////////////////////////////////
118 // Assignment 2.4 - Approximating pi
119 //////////////////////////////////////////////////
120
121
122 double pi(int n) {
123     double p = 0.0;
124     int i = 0;
125     while (i <= n) {
126         p += pow(-1, i) / (2 * i + 1);
127         i++;
128     }
129     return p;
130 }
```