```cpp
#include <iostream>
#include <cmath>
#include "Assignment2-Header.h"


using namespace std;


////////////////////////////////////////////////////////////////////////
//     Assignment 2.1 - Gaussian Sum: sum of the first n integers
////////////////////////////////////////////////////////////////////////

// Of course there's the Gauss formula to compute the sum of the first
// n intergers but the point of this assignment is showing loops.


int Gaussian(unsigned n) {
    unsigned tot = 0;
    while (n > 0) {
        tot += n;
        n--;
    }
    return tot;
}









////////////////////////////////////////////////////////////////////////
// Assignment 2.2 - Another Sum: sum of even number between 0 and n
////////////////////////////////////////////////////////////////////////


int Another(unsigned n) {
    unsigned tot = 0;
    while (n > 0) {
        if (n % 2 == 0)
            tot += n;
        n--;
    }
    return tot;
}
```

```
59
60  ////////////////////////////////////////////////////////////////////////////
61  //              Assignment 2.3 - Prime Factorization
62  ////////////////////////////////////////////////////////////////////////////
63
64  // Looping
65
66  void decomp(int n) {
67      int i = 0;
68      while (n != 1) {
69          for (i = 2; i <= n; i++) {
70              if (n % i == 0) {
71                  n /= i;
72                  if (n != 1) {
73                      cout << i << " * ";
74                      break;
75                  }
76                  else {
77                      cout << i << endl;
78                      return;
79                  }
80
81              }
82          }
83      }
84  }
85
86
87
88
89
90
91
92
93
94  // Recursive
95
96  void decompRec(int x, int d) {
97      if (x != d) {
98          if (x % d == 0) {
99              cout << d << " * ";
100             decompRec(x / d, d);
101         }
102         else {
103             d++;
104             decompRec(x, d);
105         }
106     }
107     else
108         cout << d;
109 }
110
111
112
113
114
115
116
```

```
117
118 ////////////////////////////////////////////////////////////////////////
119 // Assignment 2.4 - Approximating pi
120 ////////////////////////////////////////////////////////////////////////
121
122
123 double pi(int n) {
124     double p = 0.0;
125     int i = 0;
126     while (i <= n) {
127         p += pow(-1, i) / (2 * i + 1);
128         i++;
129     }
130     return p;
131 }
```