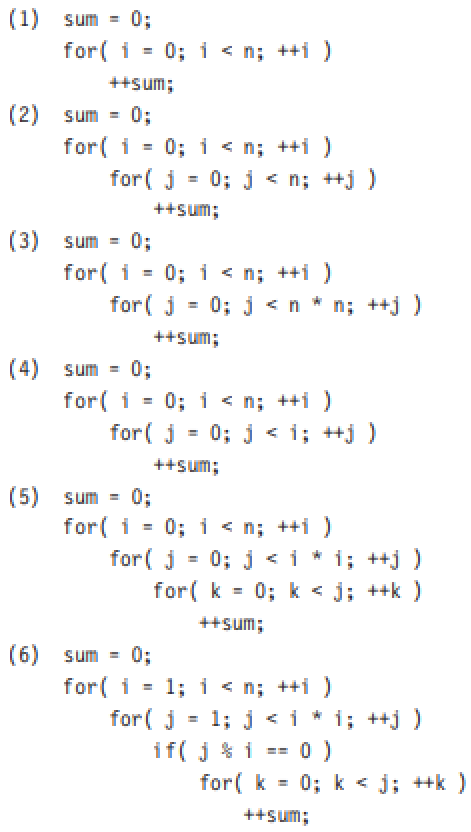
2.7 - For each of the following six program fragments:

a. Give an analysis of the running time (Big-Oh will do).

b. Implement the code in the language of your choice, and give the running time for several values of N.

c. Compare your analysis with the actual running times.



```
(1)  sum = 0;
     for( i = 0; i < n; ++i )
         ++sum;
(2)  sum = 0;
     for( i = 0; i < n; ++i )
         for( j = 0; j < n; ++j )
             ++sum;
(3)  sum = 0;
     for( i = 0; i < n; ++i )
         for( j = 0; j < n * n; ++j )
             ++sum;
(4)  sum = 0;
     for( i = 0; i < n; ++i )
         for( j = 0; j < i; ++j )
             ++sum;
(5)  sum = 0;
     for( i = 0; i < n; ++i )
         for( j = 0; j < i * i; ++j )
             for( k = 0; k < j; ++k )
                 ++sum;
(6)  sum = 0;
     for( i = 1; i < n; ++i )
         for( j = 1; j < i * i; ++j )
             if( j % i == 0 )
                 for( k = 0; k < j; ++k )
                     ++sum;
```

2.11 - An algorithm takes 0.5 ms for input size 100. How long will it take for input size 500 if the running time is the following (assume low-order terms are negligible)?

a. linear

b. O(N logN)

c. quadratic

d. cubic

2.12 - An algorithm takes 0.5 ms for input size 100. How large a problem can be solved in 1 min if the running time is the following (assume low-order terms are negligible)?

a. linear

b. O(N logN)

c. quadratic

d. cubic