

C/C++ Comment Standards

I. File Header

Each file in the solution shall have a comment block which identifies:

1. The file name,
2. The author of the file,
3. Modification History
 - a Who modified the file
 - b When
4. The classes/procedures in the file with a one line description

```
/******  
* File: matmul.c  
* Author: Richard Goodrum  
* Procedures:  
* main      - test program which initializes the data elements, time matmul, and prints  
              results  
* matmul    - brute force matrix multiplication function.  
*****/
```

II. Class/Procedure Header

Each class/procedure shall have a comment block preceding it which contains:

1. The class/procedure name,
2. The author of the class/procedure,
3. Modification History
 - a Who modified the class/procedure
 - b When
4. A summary description of the class/procedure, 4. A list of all arguments with:
 - a. Argument name,
 - b. Direction: Input (I/P), Output (O/P), Input/Output (I/O),
 - c. Type (I.e., char, double, float, int, long, etc.),
 - d. One line description of the argument.

```

/*****
* int main( int argc, char *argv[] )
* Author: Dr. Richard A. Goodrum, Ph.D.
* Date: 16 September 2017
* Description: Generates two matrices and then calls matmul to multiply them.
*     Finally, it verifies that the results are correct.
*
* Parameters:
*     argc    I/P    int        The number of arguments on the command line
*     argv    I/P    char *[]   The arguments on the command line
*     main    O/P    int        Status code (not currently used)
*****/

/*****
* int matmul( int l, int m, int n, float *A, float *B, float *C )
* Author: Dr. Richard A. Goodrum, Ph.D.
* Date: 16 September 2017
* Description: brute force matrix multiplication function.
*
* Parameters:
*     l        I/P    int        The first dimension of A and C
*     m        I/P    int        The second dimension of A and first of B
*     n        I/P    int        The second dimension of B and C
*     A        I/P    float *    The first input matrix
*     B        I/P    float *    The second input matrix
*     C        O/P    float *    The output matrix
*     matmul   O/P    int        Status code (not currently used)
*****/

```

III. Inline Comments

Many lines of the file should include comments to describe the concept represented by the line. For example:

```

y = m * x + b; // Calculate the value of y based on a linear equation and
               // the value of x

```

IV. Other Comments

Occasionally, a block of code needs a preamble to explain its nature. Hence, a block comment should precede it.

```

int matmul( int l, int m, int n, float *A, float *B, float *C )
{
    int i, j, k;

    for( i=0; i<l; i++ )                // Loop over the rows of A and C.
        for( k=0; k<n; k++ )            // Loop over the columns of B and C
        {
            // Initialize the output element for the inner
            // product of row i of A with column j of B
            C[i*n+k] = 0;
            for( j=0; j<m; j++ )          // Loop over the columns of A and C
            {
                C[i*n+k] += A[i*m+j] * B[j*n+k]; // Compute the inner product
            }
        }
}

```