# **CS 410 C++ to Assembly Activity Template**

**Step 1:** Explain the functionality of the C++ code.

## C++ Code Functionality

| **C++ Line of Code** | **Explanation of Functionality** |
| --- | --- |
| #include<iostream> | Including the header file name iostream |
| Using namespace std; | Used for the standard namespace |
| Int main() | Creates a function that returns a integer |
| Int width = 10;  Int height = 5;  Int area; | Declaring the variables that will be used in the program |
| Area = width \* height; | The math to get Area |
| Cout<<endl<<area; | Prints out the result |
| Return 0; | Exits the program |
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**Step 2:** Convert the C++ file into assembly code.

**Step 3:** Align each line of C++ code with the corresponding blocks of assembly code.

## C++ to Assembly Alignment

| **C++ Line of Code** | **Blocks of Assembly Code** |
| --- | --- |
| Int width = 10; | movl $10, -12(%rbp) |
| Int height = 5; | movl $5, -8(%rbp) |
| Int area;  Area = width \* height | movl -12(%rbp), %eax    imull -8(%rbp), %eax    movl  %eax, -4(%rbp) |
| Cout<<endl<<area; | movl -4(%rbp), %eax    movl  %eax, %esi    movq  %rdx, %rdi    call  \_ZNSolsEi@PLT |
| Return 0; | movl $0, %eax    leave |
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**Step 4:** Explain how the blocks of assembly code perform the same tasks as the C++ code.

## Assembly Functionality

| **Blocks of Assembly Code** | **Explanation of Functionality** |
| --- | --- |
| movl $10, -12(%rbp) | Declaring variable used in the program |
| movl $5, -8(%rbp) | Declaring variable used in the program |
| movl -12(%rbp), %eax    imull -8(%rbp), %eax    movl  %eax, -4(%rbp) | Declaring variable used in the program, and implementing the math to get the area variable |
| movl -4(%rbp), %eax    movl  %eax, %esi    movq  %rdx, %rdi    call  \_ZNSolsEi@PLT | Prints out the results of the math in the variable area |
| movl $0, %eax    leave | Exits the program |
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