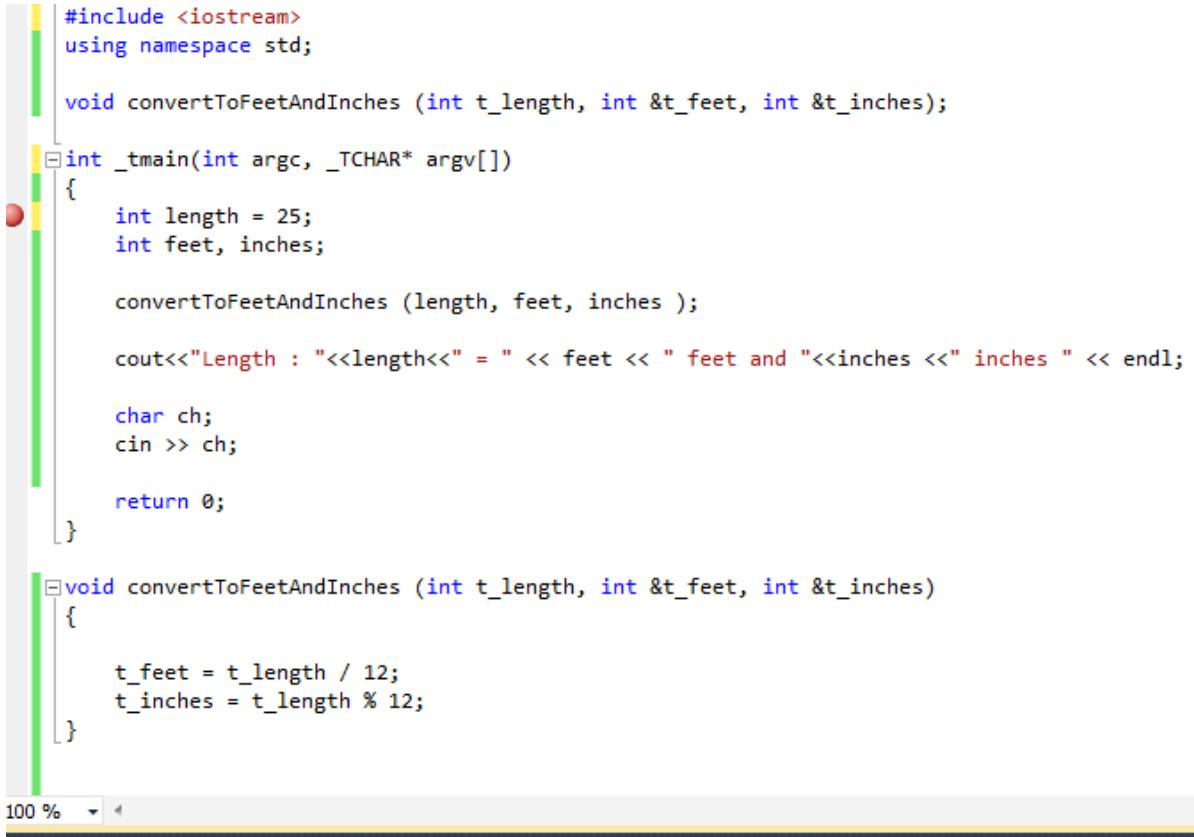


Lab Exercise 3
IT1050 – Object Oriented Concepts
Semester 1, 2024
Objectives:

- Learn to use the Visual Studio 2015 platform.
- Use output formatting and pass by reference in C++.

Exercise 1:

- a) In Visual C++, create a new Win32 Console Application project. Save the project in your Desktop. Name the project as *Lab-03-ex1*.
- b) Type the following program which converts a given length to feet and inches.



```

#include <iostream>
using namespace std;

void convertToFeetAndInches (int t_length, int &t_feet, int &t_inches);

int _tmain(int argc, _TCHAR* argv[])
{
    int length = 25;
    int feet, inches;

    convertToFeetAndInches (length, feet, inches );

    cout<<"Length : "<<length<<" = " << feet << " feet and "<<inches <<" inches " << endl;

    char ch;
    cin >> ch;

    return 0;
}

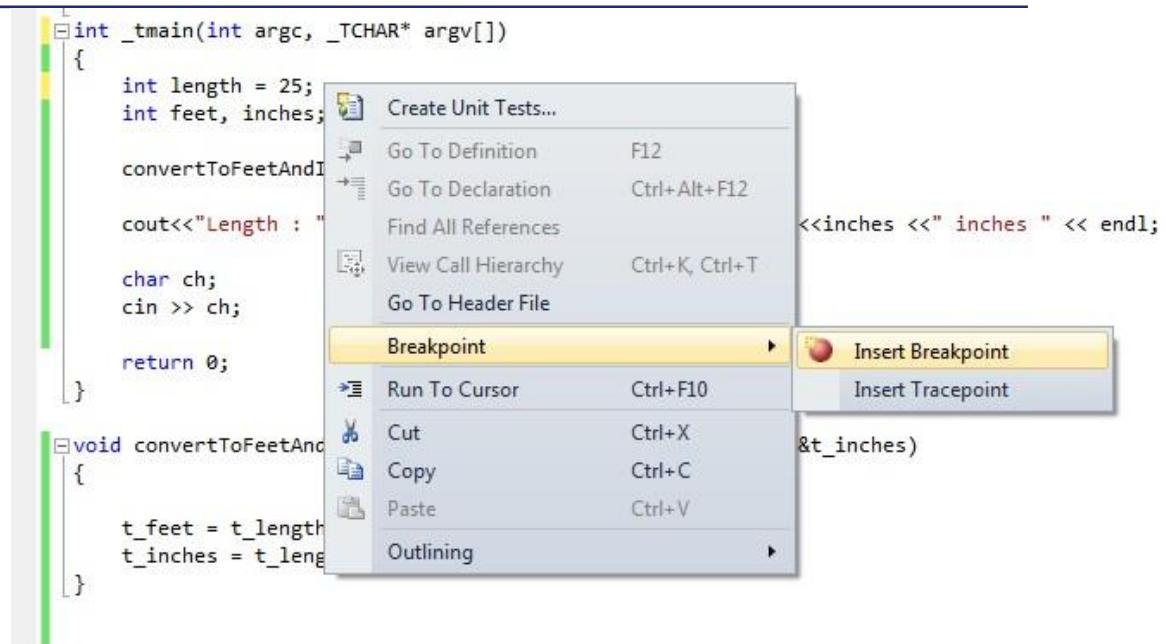
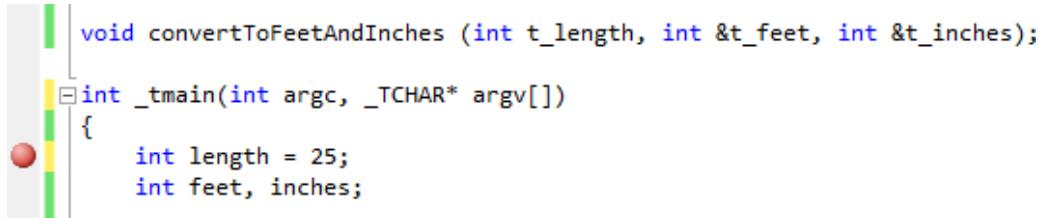
void convertToFeetAndInches (int t_length, int &t_feet, int &t_inches)
{
    t_feet = t_length / 12;
    t_inches = t_length % 12;
}

```

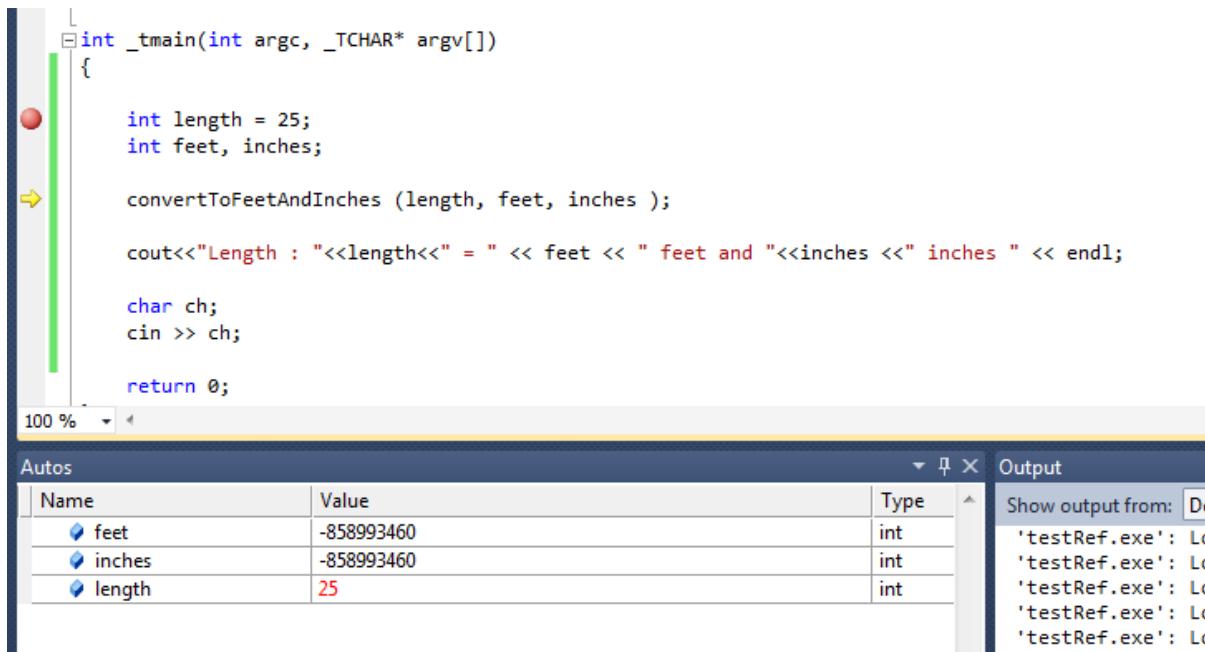
100 %

Figure 1

- c) To debug the program do the following ;
 - a. Right click on the line shown and add a “Breakpoint”

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Figure 2

Figure 3

- To run the program click “Start Debugging” or press F5.
- The program will stop running at the line which you have put a “Breakpoint”
- Check the “Autos” window on the bottom of the editor to see the initial values of the three variables `length`, `feet` and `inches`.
- Now, to run the program press “F11” or “Step Into” in the “Debug” menu. The program will be executed line by line.
- View how the values of the variables “feet” and “Length” get modified through the reference parameters “`t_feet`” and “`t_inches`” in the “`convertToFeetAndInches()`” function. (See figure 4 to 8 Below)

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```

int _tmain(int argc, _TCHAR* argv[])
{
    int length = 25;
    int feet, inches;

    convertToFeetAndInches (length, feet, inches );

    cout<<"Length : "<<length<< " = " << feet << " feet and "<<inches <<" inches " << endl;

    char ch;
    cin >> ch;

    return 0;
}

```

Autos

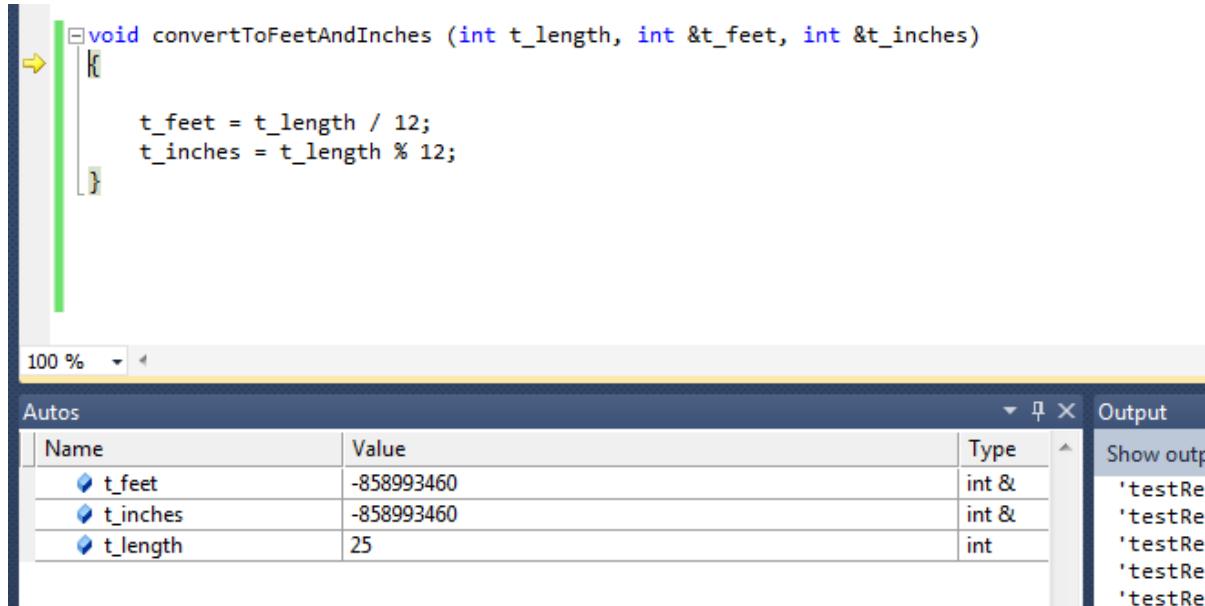
Name	Value	Type
feet	-858993460	int
inches	-858993460	int
length	25	int

Output

```

Show output from: De
'testRef.exe': Lo
'testRef.exe': Lo
'testRef.exe': Lo
'testRef.exe': Lo
'testRef.exe': Lo

```

Figure 4


```

void convertToFeetAndInches (int t_length, int &t_feet, int &t_inches)
{
    t_feet = t_length / 12;
    t_inches = t_length % 12;
}

```

Autos

Name	Value	Type
t_feet	-858993460	int &
t_inches	-858993460	int &
t_length	25	int

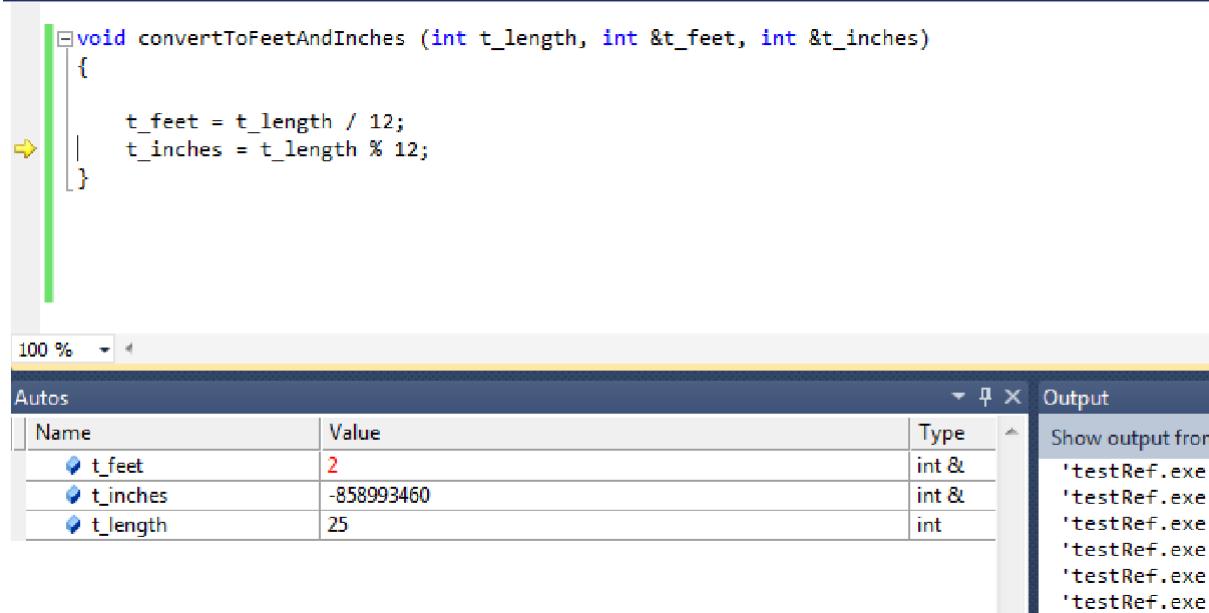
Output

```

Show output
'testRef'
'testRef'
'testRef'
'testRef'
'testRef'

```

Figure 5

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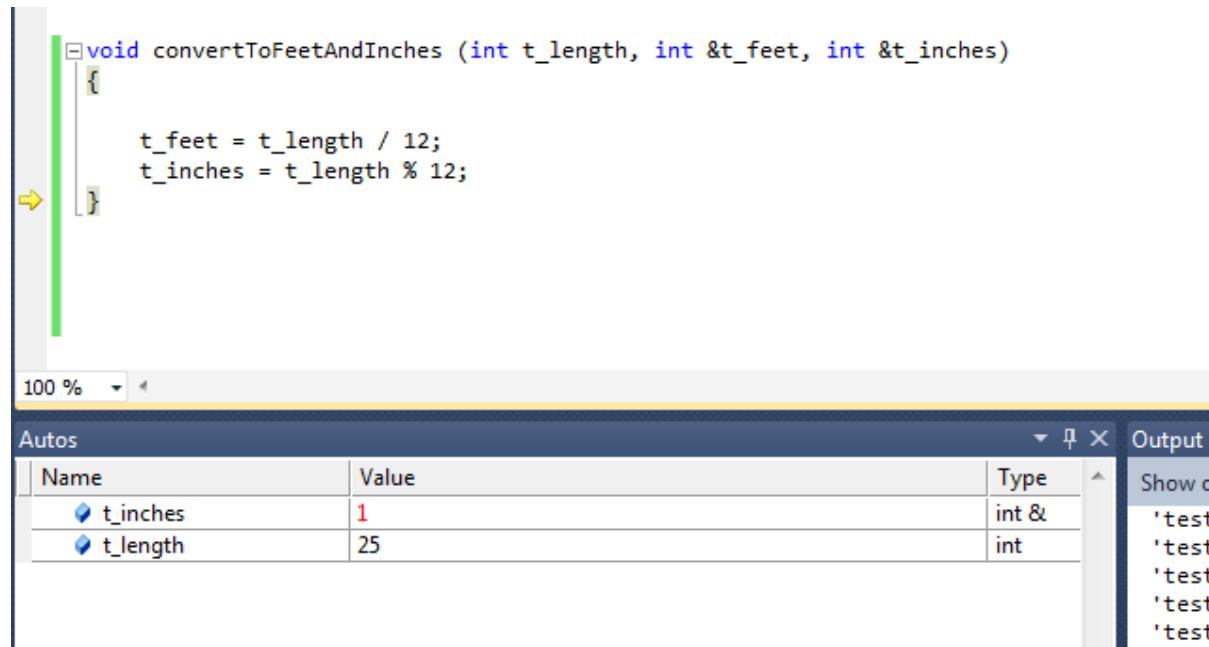
```
void convertToFeetAndInches (int t_length, int &t_feet, int &t_inches)
{
    t_feet = t_length / 12;
    t_inches = t_length % 12;
}
```

100 %

Name	Value	Type
t_feet	2	int &
t_inches	-858993460	int &
t_length	25	int

Output

Show output from
'testRef.exe'
'testRef.exe'
'testRef.exe'
'testRef.exe'
'testRef.exe'
'testRef.exe'

Figure 6


```
void convertToFeetAndInches (int t_length, int &t_feet, int &t_inches)
{
    t_feet = t_length / 12;
    t_inches = t_length % 12;
}
```

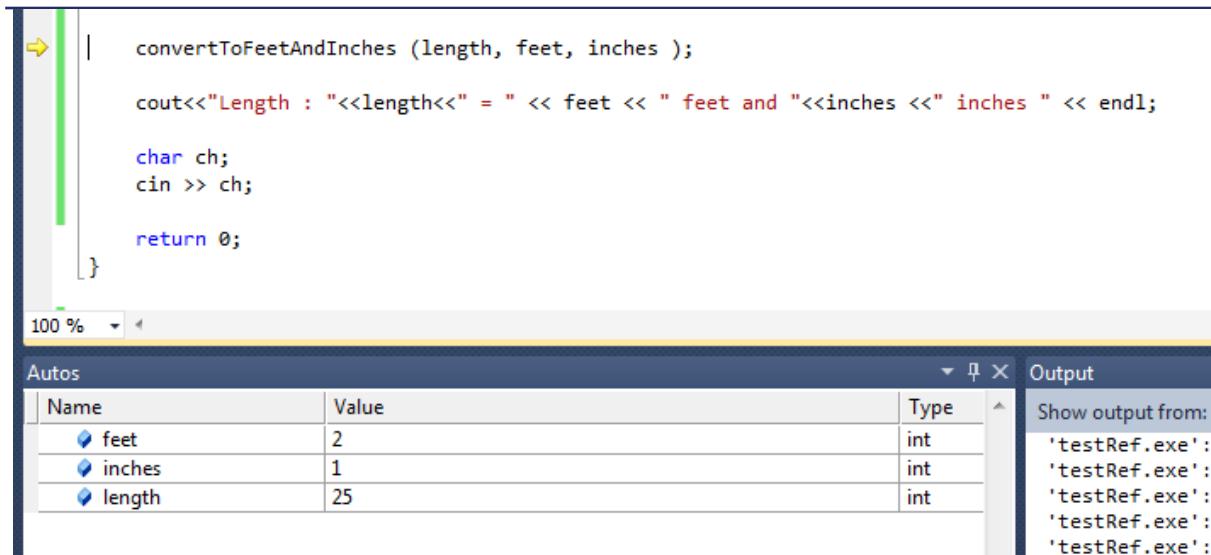
100 %

Name	Value	Type
t_inches	1	int &
t_length	25	int

Output

Show o
'test
'test
'test
'test
'test

Figure 7

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The screenshot shows a debugger interface with the following components:

- Code View:** Displays C++ code with syntax highlighting. The code includes a function `convertToFeetAndInches` that prints length in feet and inches.
- Variables View (Autos):** A table showing variable values:

Name	Value	Type
feet	2	int
inches	1	int
length	25	int
- Output View:** Shows the command 'testRef.exe' being run five times, each time producing the same output: 'Length : <<length<< = 2 feet and 1 inches <<inches <<'.

Figure 8
Exercise 2

Write a program to input the marks a student for two assignments and find the final mark of each assignment according to the percentages given. In your program;

- 1) Implement a function to find the contribution of each assignment mark sent to the function as parameters. In the function you should update two variables called CA1 and CA2, which are defined in the main program. The function heading is given below;

```
void findMarks (int t_marks1, int t_marks2, float &t_CA1, float &t_CA2);
```

The final CA mark for each assignment is calculated as shown below;

Assignment 1	20%
--------------	-----

Assignment 2	30%
--------------	-----

- 2) In the main program, input marks for 5 students and show the percentages of the marks using *findMarks()* function in a table as shown below. Format the output to 2 decimal places.

Student	Marks1	Marks2	CA_1	CA_2
1	60	65	12.00	19.50
2	37	43	7.40	12.90
3	75	80	15.00	24.00
4	92	75	18.40	22.50
5	53	45	10.60	15.90