

Assignment, Standard output and input

- **Expression:** valid arrangement of variables, constants, and operators (+, -, *, /, %, =, (), >>, <<)
- **Assignment** `variable = expression;`
Expression on the right-hand side is evaluated first. Then, the resulting value is stored in the variable
Examples: `length = 12*0.5-10;`
- Variable initialization: `int length = 12, width = 5, area;`
- **cout object** -- used to display to the Standard Output
`cout` : standard output stream
`<<` : insertion operator (put the next data onto the console)

Example:

```
#include <iostream> ← preprocessor directory needed to use the cout object and the cin object
using namespace std;
int main()
{
    float price=500.0;

    cout << "There are " << 2 << " tickets available." << endl;
    cout << "Each ticket costs $" << price << endl;
    cout << 2 << "tickets cost " << '$' << 2*price << '.' << endl;

    return 0;
}
```

****Note ****

- (1) need to have a "<<" in between every two expressions :
`5*6, 14+7, " AFC Champaign", 50, 'c', ...`
- (2) differentiate **string literal** and **variable** in cout statement
- (3) break output into multiple "cout" statements
- (4) white space in output

- **cin object** – used to read from the Standard Input

`cin` : standard input stream
`>>` : the extraction operator extracts the next item from the input stream, and store its value in the right hand side operand variable

Example:

```
#include <iostream>
using namespace std;
int main()
{
    int    roomNum;
```

```

float    price;

cout << "Enter the room number: ";
cin >> roomNum;

cout << "Enter the price for the room: ";
cin >> price ;

/* Or :
cout << "Enter the room number and price: ";
cin >> roomNum >> price; // the order of the input values needs to be the same as the
                        // order of variables in cin

*/
....
return 0;
}

```

**** Notes: ****

- (1) Before the user enters a data, a prompt should be provided to explain what type of information should be entered
- (2) the separators for the extraction operator are the white space characters : any number or combination of space, tab, and new-line characters.
- (3) Leading white spaces are skipped over.

Program 3-3

```

1  // This program demonstrates how cin can read multiple values
2  // of different data types.
3  #include <iostream>
4  using namespace std;
5
6  int main()
7  {
8      int whole;
9      double fractional;
10     char letter;
11
12     cout << "Enter an integer, a double, and a character: ";
13     cin >> whole >> fractional >> letter;
14     cout << "Whole: " << whole << endl;
15     cout << "Fractional: " << fractional << endl;
16     cout << "Letter: " << letter << endl;
17     return 0;
18 }

```

Program Output with Example Input Shown in Bold

```

Enter an integer, a double, and a character: 4 5.7 b [Enter]
Whole: 4
Fractional: 5.7
Letter: b

```

What if the user input is : 45.7c ?

Practice Problems: <User input is underlined>

1. Write a C++ program that prompts the user to enter 3 integer values, and it displays the mean of the three values.

Please enter three integer values: 34 20 8

The mean of the three values: 34, 20, and 8 is 20.677.

2. Write a C++ program that prompts the user to enter the radius of a circle, and it computes and displays the diameter, the circumference, and the area of the circle.

Please enter the radius of the circle (cm): 2.0

The radius of a circle = 2.0 cm.

The diameter of the circle = 4.0 cm.

The circumference of the circle = 12.56 cm

The area of the circle = 78.87 cm².