

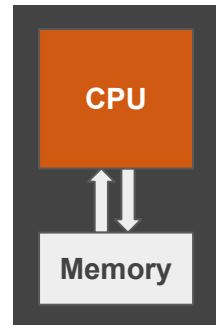


Input, Store and Output data In C++



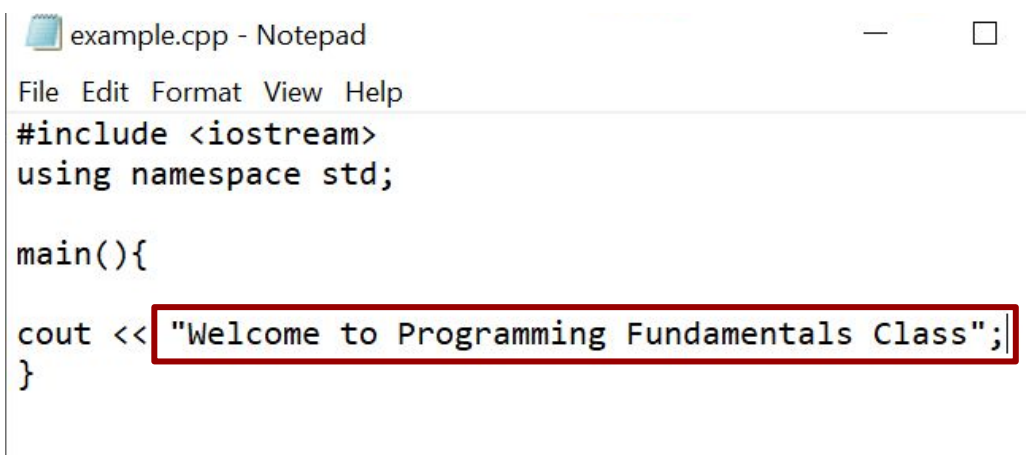
Review: CPU Operations

- Some of these operations include
 1. Addition (0010)
 2. Multiplication (0011)
 3. Take Input (1100)
 4. Store Data (1110)
 5. Give Output (0110)
 6. Load Data (0111)



Review: Output

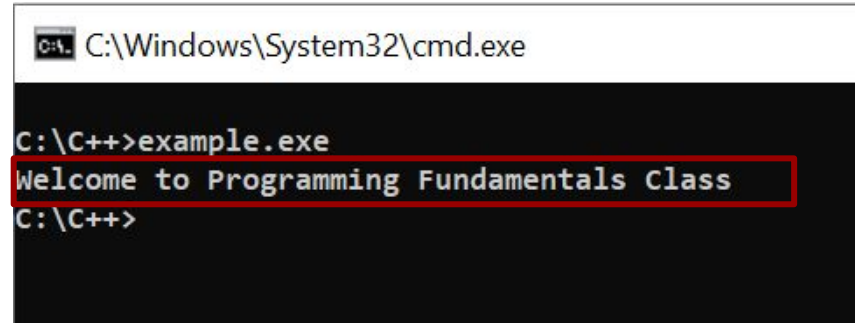
We wrote "Welcome to Programming Fundamentals Class" on Console.

A screenshot of a Notepad window titled 'example.cpp - Notepad'. The window has a menu bar with 'File', 'Edit', 'Format', 'View', and 'Help'. The code is written in C++ and includes the <iostream> header and the std namespace. The main function contains a cout statement that outputs the string 'Welcome to Programming Fundamentals Class'. The string is highlighted with a red box.

```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;

main(){

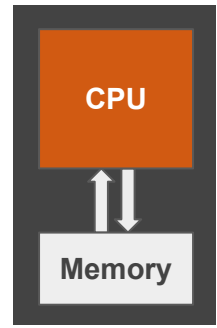
cout << "Welcome to Programming Fundamentals Class";
}
```

A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The prompt shows the execution of 'example.exe' in the 'C:\C++' directory. The output 'Welcome to Programming Fundamentals Class' is displayed and highlighted with a red box. The prompt then returns to 'C:\C++>'.

```
C:\Windows\System32\cmd.exe
C:\C++>example.exe
Welcome to Programming Fundamentals Class
C:\C++>
```

CPU Operations

- Some of these **operations** include
 1. Addition (0010)
 2. Multiplication (0011)
 3. Take Input (1100)
 4. Store Data (1110)
 5. Give Output (0110)
 6. Load Data (0111)



Store Data

Write a C++ program, that **reserves a memory** location of type **int** and **store** 8 into it.



example.cpp - Notepad

File Edit Format View Help

```
#include <iostream>
using namespace std;
main()
{
    int number;
    number = 8;
}
```

Variable Declaration



Store Data

Write a C++ program, that **reserves a memory** location of type `int` and **store** 8 into it.



example.cpp - Notepad

File Edit Format View Help

```
#include <iostream>
using namespace std;
main()
{
    int number;
    number = 8;
}
```



Store Data

Similarly, you can **store any type of data** (int, float, string, char)

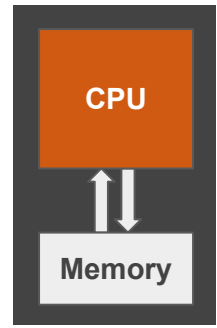


```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    int number = 8;
    float decimal = 8.9;
    char letter = 'A';
    string sentence = "This is a string";
}
Ln 14, Col 1 100% Windows (CRLF) UTF-8
```



CPU Operations

- Some of these **operations** include
 1. Addition (0010)
 2. Multiplication (0011)
 3. Take Input (1100)
 4. Store Data (1110)
 5. Give Output (0110)
 6. Load Data (0111)



Store Data and Give Output

Write a C++ program, that **reserves a memory** location of type `int` and **store** 8 into it and display the value of variable **on screen**.



*example.cpp - Notepad

File Edit Format View Help

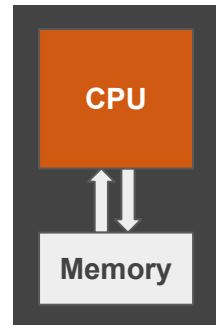
```
#include <iostream>
using namespace std;
main()
{
    int number;
    number = 8;
    cout << number;
}
```

When we display a variable on the console then we **do not use double quotes** (" ")



CPU Operations

- Some of these **operations** include
 1. Addition (0010)
 2. Multiplication (0011)
 3. Take Input (1100)
 4. Store Data (1110)
 5. Give Output (0110)
 6. Load Data (0111)



Take Input

Computers can **take input** in different forms using:

Keyboard



Mouse

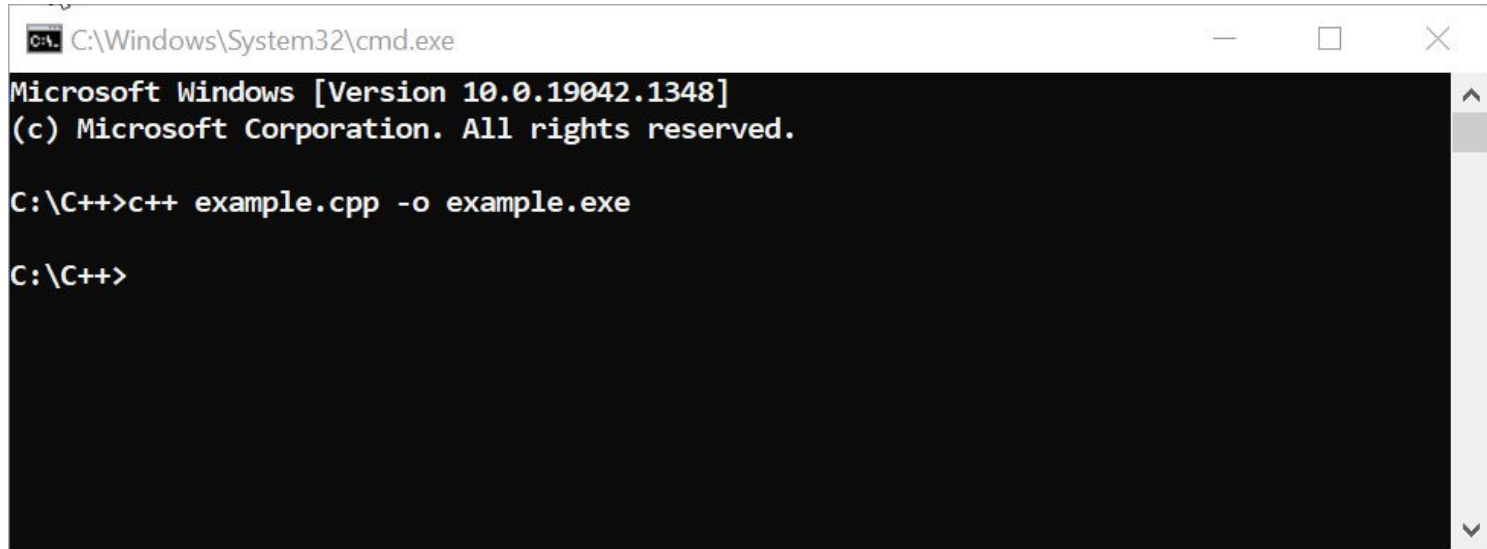


Microphone



Take input from Console

Write a C++ program, that takes name as input from the console and then show it with a message on the console.



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19042.1348]
(c) Microsoft Corporation. All rights reserved.

C:\C++>c++ example.cpp -o example.exe

C:\C++>
```

Input from the Console in C++

Variable declaration means CPU is allocating some space in memory for specific type of data (int, float, string, char)



```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    string user_name;
    cout << "Please Enter your Name: ";
    cin >> user_name;
    cout << "User Entered " << user_name << " as his/her name.";
}
```

We have to store the input in memory, therefore, we have reserved memory for **string** type of data

Input from the Console in C++

cout command is used to display output on Console in C++.



```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    string user_name;
    cout << "Please Enter your Name: ";
    cin >> user_name;
    cout << "User Entered " << user_name << " as his/her name.";
}
```

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We display a message to user, so he knows which type of input he has to enter.

Input from the Console in C++

`cin` command is used to take input from the Console in C++.



```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    string user_name;
    cout << "Please Enter your Name: ";
    cin >> user_name;
    cout << "User Entered " << user_name << " as his/her name.";
}
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```

`cin` stands for Character Input.

Input from the Console in C++

`cin` command is used to take input from the Console in C++.



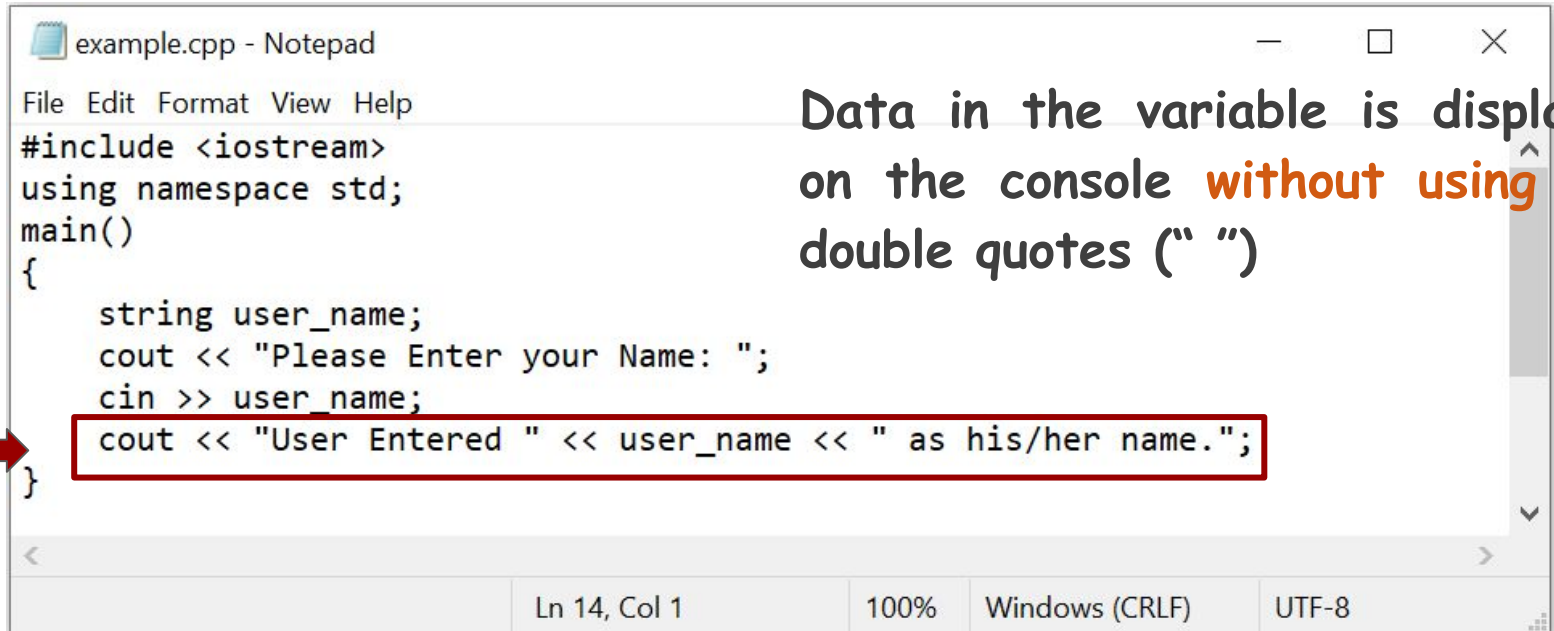
```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    string user_name;
    cout << "Please Enter your Name: ";
    cin >> user_name;
    cout << "User Entered " << user_name << " as his/her name.";
}

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```

`cin` is a predefined command that reads data from the keyboard with the extraction operator (`>>`)

Input from the Console in C++

`cout` command is used to display output on Console in C++.



```
example.cpp - Notepad
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    string user_name;
    cout << "Please Enter your Name: ";
    cin >> user_name;
    cout << "User Entered " << user_name << " as his/her name.";
}
```

Data in the variable is displayed on the console without using the double quotes (" ")

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Input from the Console in C++

Output on the console of the program is as follows:

```
C:\C++>c++ example.cpp -o example.exe  
  
C:\C++>example.exe  
Please Enter your Name: Talha  
User Entered Talha as his/her name.  
C:\C++>
```

Input from the Console in C++

Similarly, you can **take any type of data** (int, float, string, char) as input from the console.

 example.cpp - Notepad

```
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    int number;
    cin >> number;
}
```

 example.cpp - Notepad

```
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    float number;
    cin >> number;
}
```

 example.cpp - Notepad

```
File Edit Format View Help
#include <iostream>
using namespace std;
main()
{
    char alphabet;
    cin >> alphabet;
}
```

Learning Objective

Write a **C++** program that takes data as **input** from the user, **stores** that data and displays that as **output** on Console.



Conclusion

- We can have multiple uses of variables
 1. Assign Values
 2. Retrieve Values
 3. Apply Mathematical Operations
- Assignment is done using **Assignment Operator**.
- There are 3 ways in which we can assign values to the variables
 1. Constants
 2. Variables
 3. Expressions
- An **Expression** is a combination of **Variables**, **Constants** and **Operators**.
- **Expressions** are evaluated with the **Precedence** order of **Operators**.
- The precedence order is given by **PEMDAS** Rule.

Self Assessment

- What is the **Difference** between single computational step and multiple computational step?
- What is **Machine** Language?
- Why computer use the **Binary Language**?
- What is the Role of **Compiler**?
- In which language, it is easy for **Programmers** to write their **Programs**? Binary or High Level Language?

