# EXPERIMENT.NO - 5

**Aim:-** Implement the formatted IO function for given statement.

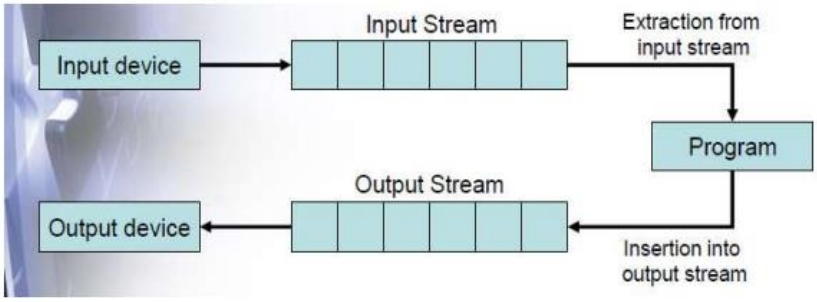
**Objectives:-**

1) To understand and implement formatted IO function.

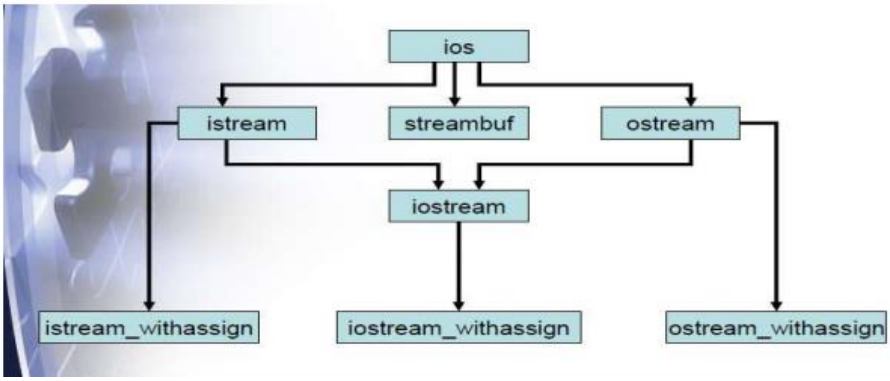
**Theory:-**

C ++ Stream:Stream is an interface supplied by the I/O system of C++ between the programmer and the actual device being accessed. It will work with devices like terminals, disks and tape drives. A stream is a sequence of bytes. It acts either as a source from which the input data can be obtained or as a destination to which the output data can be sent.

- **Input Stream** - The source stream that provides data to the program.
- **Output Stream** - The destination stream that receives output from the program.




**C ++ Stream Classes:**



- The C++ I/O system contains a hierarchy of classes that are used to define various streams to deal with both the console and disk files.
- These classes are called stream classes.
- These classes are declared in the header file iostream.

**Console IO operation types:**

1. Unformatted I/O Operations

2. Formatted I/O Operations

**1. Unformatted I/O Operations:**

The objects cin and cout are used for input and output of data of various types.

- ⇨ By overloading the operators >> and <<.
- ⇨ >> operator is overloaded in the istream class.
- ⇨ << operator is overloaded in the ostream class. This is used for input data through keyboard.
- ⇨ cin >> variable1 >> varibale2 ... >> variableN

where variable1, variable2, ..., variableN are valid C++ variable names.

- ⇨ cout << item1 << item2 << ... << itemN

Where item1, item2, ...,itemN may be variables or constants of an basic type.

- ⇨ **get( ) and put( )** are member functions of istream and ostream classes. For single character input/output operations.

There are two types of get( ) functions:

– get(char*) ➔ Assigns the input character to its argument.

– get(void) ➔ Returns the input character.

- ⇨ char c; cin.get(c) c = cin.get( );

– put( ) ➔ used to output a line of text, character by character.

- ⇨ char c; cout.put(„x"); cout.put(c);

- ⇨ getline( ) function reads a whole line of text that ends with a newline character. cin.getline(line, size); Reading is terminated as soon as either the newline character „\n" is encountered or size-1 characters are read.

- ⇨ write( ) function displays an entire line of text. cout.write(line, size); write( ) also used to concatenate strings.

**2. Formatted I/O Operations:**

C++ supports a number of features that could be used for formatting the output.

These features include:

- ⇨ ios class functions and flags.
- ⇨ Manipulators.
- ⇨ User-defined output functions.

**ios member functions:**

**width( )** ➔ to specify the required field size for displaying an output value.

**precision( )** ➔ to specify the number of digits to be displayed after the decimal point of a float value.

**fill( )** ➔ to specify a character that is used to fill the unused portion of a field.

**setf( )** ➔ to specify format flags that can control the form of output display.

**unsetf( )** ➔ to clear the flags specified.

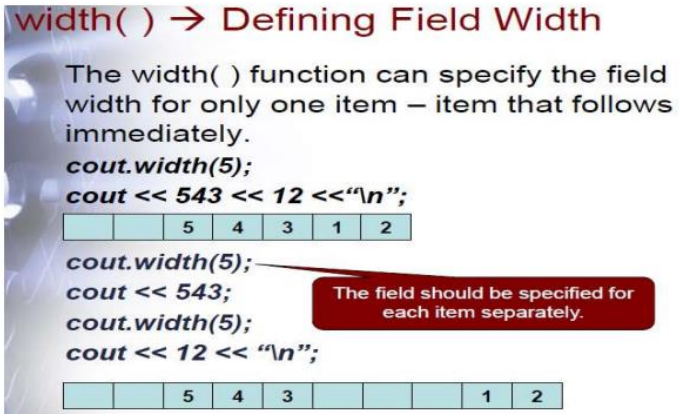
**Manipulators:**

Manipulators are special functions that can be included in the I/O statement to alter the

format parameters of a stream.

To access manipulators, the file iomanip.h should be included in the program.

- ⇨ setw( )
- ⇨ setprecision( )
- ⇨ setfill( )
- ⇨ setiosflags( )
- ⇨ resetiosflags( )



**For given problem statement following formatted Io used:**

```
cout.width(82);
cout.fill('=');. //To print Lline with “=”

cout.width(45);
cout.fill('=');  //To print Lline with “=”
```

**Source Code :**

```
#include<iostream>
#include<stdio.h>

// Assignment-5

/*Here in Assignment 5 we have used formatted console I/O operations in our project
  Here in this Project we have used 1.width() & 2.fill operator*/

using namespace std;

class User
{
private:
   string name;
   string lastname;
   string fn;

 public:
     User()//default constructor used
```

```
    {
        cout<<"\n * Enter the First name : ";
        cin>>name;
        cout<<"\n * Enter the lastname : ";
        cin>>lastname;
    }
    string fullname()
    {
      fn=name+" "+lastname;
      return fn;
    }
    void display()
   {
      cout<<"\n\n ** Hello "<<fn<<" Welcome to our Program !!!! \n"<<endl;
   }
   ~User()//Destructor called
   {
      cout<<"\n\n User Destructed Successfully !!!!\n\n"<<endl;
      cout.width(82);
      cout.fill('=');//formatted operation
      cout<<"\n\n";
   }
};

class Features : public User // Single Inheritance Used Class Feature Derived From Class User
{
  int os;
   int processor;
```

```
    int ram;
public:

    void select_os();
    void select_processor();
    void select_ram();
    void display_features();
};
void Features::select_os() // member function
{
    cout.width(45);
    cout.fill('=');//formatted operation
    cout<<"\n\n";
    cout<<"\n ** Please Select The Operating system you want in your Laptop : \n"<<endl;
    cout<<"\n 1.Windows "<<endl;
    cout<<"\n 2.MAC Os "<<endl;
    cout<<"\n 3.Exit"<<endl;
    cout<<"\n Enter Your Choice : ";
    cin>>os;
    switch(os)
    {
    case 1:
        cout<<"\n * You have Selected Your Os ==> windows Os \n\n"<<endl;
        cout.width(45);
        cout.fill('=');//formatted operation
        cout<<"\n\n";
        break;
    case 2:
```

```
        cout<<"\n * You have Selected Your Os ==> MAC Os \n\n"<<endl;
        cout.width(45);
        cout.fill('=');
        cout<<"\n\n";
        break;
    case 3:
        cout<<"\n Terminated Successfully !!"<<endl;
        cout<<"\n Thank You Visit Again !!!! \n"<<endl;
        exit(0);
        break;
    default :
        cout<<"\n Enter valid choice !";
        exit(0);
    }
}
void Features::select_processor()
{
if(os==1){
    cout<<"\n\n **Select the Processor : \n"<<endl;
    cout<<"1. Intel i3"<<endl;
    cout<<"2. Intel i5"<<endl;
    cout<<"3. Intel i7"<<endl;
    cout<<"4. Intel i9"<<endl;
    cout<<"5. AMD Ryzen 5"<<endl;
    cout<<"6. AMD Ryzen 7"<<endl;
    cout<<"7. Exit"<<endl;
    cout<<"\n Enter Your Choice : ";
    cin>>processor;
```

```
switch(processor)
{
case 1:
    cout<<"\n * You have Selected Your Processor ==> Intel i3 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');//formatted operation
    cout<<"\n\n";
    break;
case 2:
    cout<<"\n * You have Selected Your Processor ==> Intel i5 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 3:
    cout<<"\n * You have Selected Your Processor ==> Intel i7 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 4:

    cout<<"\n * You have Selected Your Processor ==> Intel i9 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 5:
```

```
    cout<<"\n * You have Selected Your Processor ==> AMD Ryzen 5 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 6:
    cout<<"\n * You have Selected Your Processor ==> AMD Ryzen 7 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 7:
    cout<<"\n Terminated Successfully !!"<<endl;
    cout<<"\n Thank You Visit Again !!!!\n"<<endl;
    exit(0);
    break;
default :
    cout<<"\n Enter valid choice !";
    exit(0);
}
}
else if(os==2)
{
cout<<"\n\n **Select the Processor : \n"<<endl;
cout<<"1. Intel i3"<<endl;
cout<<"2. Intel i5"<<endl;
cout<<"3. Intel i7"<<endl;
cout<<"4. Intel i9"<<endl;
```

```
cout<<"5. Exit"<<endl;
cout<<"\n Enter Your Choice : ";
cin>>processor;
switch(processor)
{
case 1:
    cout<<"\n * You have Selected Your Processor ==> Intel i3 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 2:
    cout<<"\n * You have Selected Your Processor ==> Intel i5 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 3:
    cout<<"\n * You have Selected Your Processor ==> Intel i7 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 4:
    cout<<"\n * You have Selected Your Processor ==> Intel i9 \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
```

```
        break;
    case 5:
        cout<<"\n Terminated Successfully !!"<<endl;
        cout<<"\n Thank You Visit Again !!!!\n"<<endl;
        exit(0);
        break;
    default :
        cout<<"\n Enter valid choice ! ";
        exit(0);
    }
    }
}
void Features::select_ram()
{
if(os==1){
    cout<<"\n\n **Select the RAM : \n"<<endl;
    cout<<"1. 4 GB"<<endl;
    cout<<"2. 8 GB"<<endl;
    cout<<"3. 16 GB"<<endl;
    cout<<"4. 32 GB"<<endl;
    cout<<"5. Exit"<<endl;
    cout<<"\n Enter Your Choice : ";
    cin>>ram;
    switch(ram)
    {
    case 1:
        cout<<"\n * You have Selected Your RAM ==> 4 GB \n\n"<<endl;
        cout.width(45);
```

```
    cout.fill('=');
    cout<<"\n\n";
    break;
case 2:

   cout<<"\n * You have Selected Your RAM ==> 8 GB \n\n"<<endl;
   cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 3:
    cout<<"\n * You have Selected Your RAM ==> 16 GB \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 4:
    cout<<"\n * You have Selected Your RAM ==> 32 GB \n\n"<<endl;
    cout.width(45);
    cout.fill('=');
    cout<<"\n\n";
    break;
case 5:
    cout<<"\n Terminated Successfully !!"<<endl;
    cout<<"\n Thank You Visit Again !!!!\n"<<endl;
    exit(0);
    break;
default :
```

```
        cout<<"\n Enter valid choice ";
         exit(0);
    }
}

if(os==2)
{
    cout<<"\n\n **Select the RAM : "<<endl;
    cout<<"1. 8 GB"<<endl;
    cout<<"2. 16 GB"<<endl;
    cout<<"3. Exit"<<endl;
    cout<<"\n Enter Your Choice : ";
    cin>>ram;
    switch(ram)
    {
    case 1:
       cout<<"\n * You have Selected Your RAM ==> 8 GB \n\n"<<endl;
       cout.width(45);
        cout.fill('=');
        cout<<"\n\n";
        break;
    case 2:
        cout<<"\n * You have Selected Your RAM ==> 16 GB \n\n"<<endl;
        cout.width(45);//formatted operation
        cout.fill('=');
        cout<<"\n\n";
        break;
    case 3:
```

```
        cout<<"\n Terminated Successfully !!"<<endl;
        cout<<"\n Thank You Visit Again !!!!\n"<<endl;
        exit(0);
        break;
    default :
        cout<<"\n Enter valid choice ";
         exit(0);
    }
}
}
void Features::display_features()
{
    cout<<"\n * Your Selected Specifications are ==> \n"<<endl;
 //OS
    if(os==1){
        cout<<"\n Operating System ==> Windows Os"<<endl;
    //Processor
    if(processor==1)
        cout<<"\n Processor ==> Intel i3"<<endl;
    else if(processor==2)
        cout<<"\n Processor ==> Intel i5"<<endl;
    else if(processor==3)
        cout<<"\n Processor ==> Intel i7"<<endl;
    else if(processor==4)
        cout<<"\n Processor ==> Intel i9"<<endl;
    else if(processor==5)
        cout<<"\n Processor ==> Ryzen 5"<<endl;
    else if(processor==6)
```

```
        cout<<"\n Processor ==> Ryzen 7"<<endl;
     //RAM
    if(ram==1)
        cout<<"\n RAM ==> 4 GB"<<endl;
    else if(ram==2)
        cout<<"\n RAM ==> 8 GB"<<endl;
    else if(ram==3)
        cout<<"\n RAM ==> 16 GB"<<endl;
    else if(ram==4)
        cout<<"\n RAM ==> 32 GB"<<endl;
}
    //for mac
    else if(os==2){
        cout<<"\n Operating System ==> MAC Os "<<endl;
    if(processor==1)
        cout<<"\n Processor ==> Intel i3"<<endl;
     else if(processor==2)
        cout<<"\n Processor ==> Intel i5"<<endl;
     else if(processor==3)
        cout<<"\n Processor ==> Intel i7"<<endl;
     else if(processor==4)
        cout<<"\n Processor ==> Intel i9"<<endl;

     //ram mac
    if(ram==1)
       cout<<"\n RAM ==> 8 GB"<<endl;
    else if(ram==2)
       cout<<"\n RAM ==> 16 GB"<<endl;
```

```
    }
}
int main()
{
        cout.width(82);//formatted operation
        cout.fill('=');
        cout<<"\n\n";
    cout<<"\t\t***********************************"<<endl;
    cout<<"\t\t*   Laptop Customization System   *"<<endl;
    cout<<"\t\t***********************************\n\n"<<endl;
    Features f;//object created
    f.fullname();
    f.display();
    f.select_os();
    f.select_processor();
    f.select_ram();
    system("cls");
    f.display_features();
    cout<<"\n\n * Thank you Visit Again :) !!!! "<<endl;
        return 0;
}
```

**Output :**

```
================================================================================
========

                                  **********************************

                                 *         Laptop Customization System        *

                                  **********************************

 * Enter the First name : Piyush

 * Enter the lastname : Sonawane

 ** Hello Piyush Sonawane Welcome to our Program !!!!

=========================================

 ** Please Select The Operating system you want in your Laptop :

 1.Windows

 2.MAC Os

 3.Exit

 Enter Your Choice : 1

 * You have Selected Your Os ==> windows Os

=========================================

 **Select the Processor :

1. Intel i3

2. Intel i5

3. Intel i7

4. Intel i9

5. AMD Ryzen 5

6. AMD Ryzen 7

7. Exit

 Enter Your Choice : 2

 * You have Selected Your Processor ==> Intel i5
```

==========

**Select the RAM :

1. 4 GB

2. 8 GB

3. 16 GB

4. 32 GB

5. Exit

Enter Your Choice : 2

* Your Selected Specifications are ==>

Operating System ==> Windows Os

Processor ==> Intel i5

RAM ==> 8 GB

* Thank you Visit Again :) !!!!

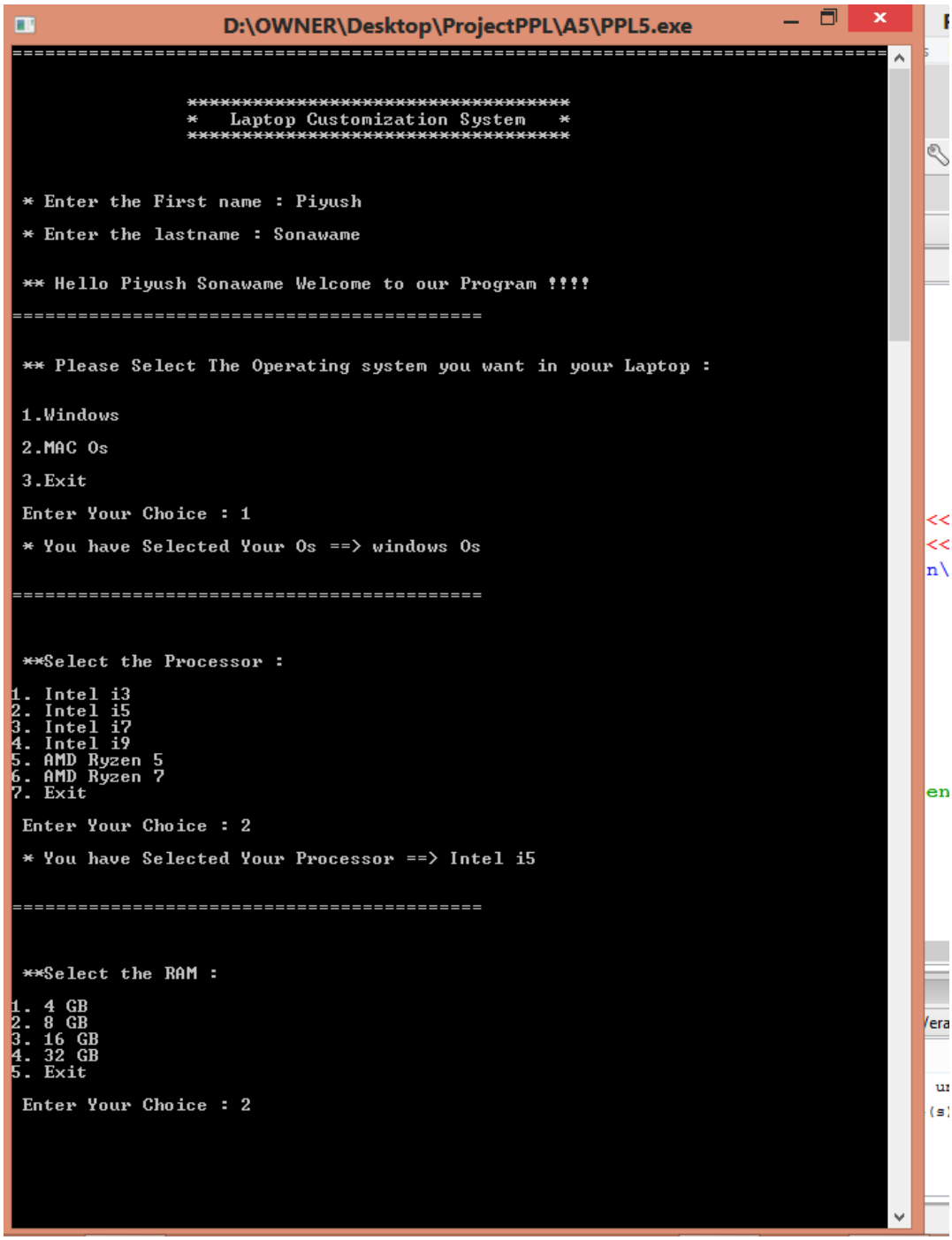
User Destructed Successfully !!!!

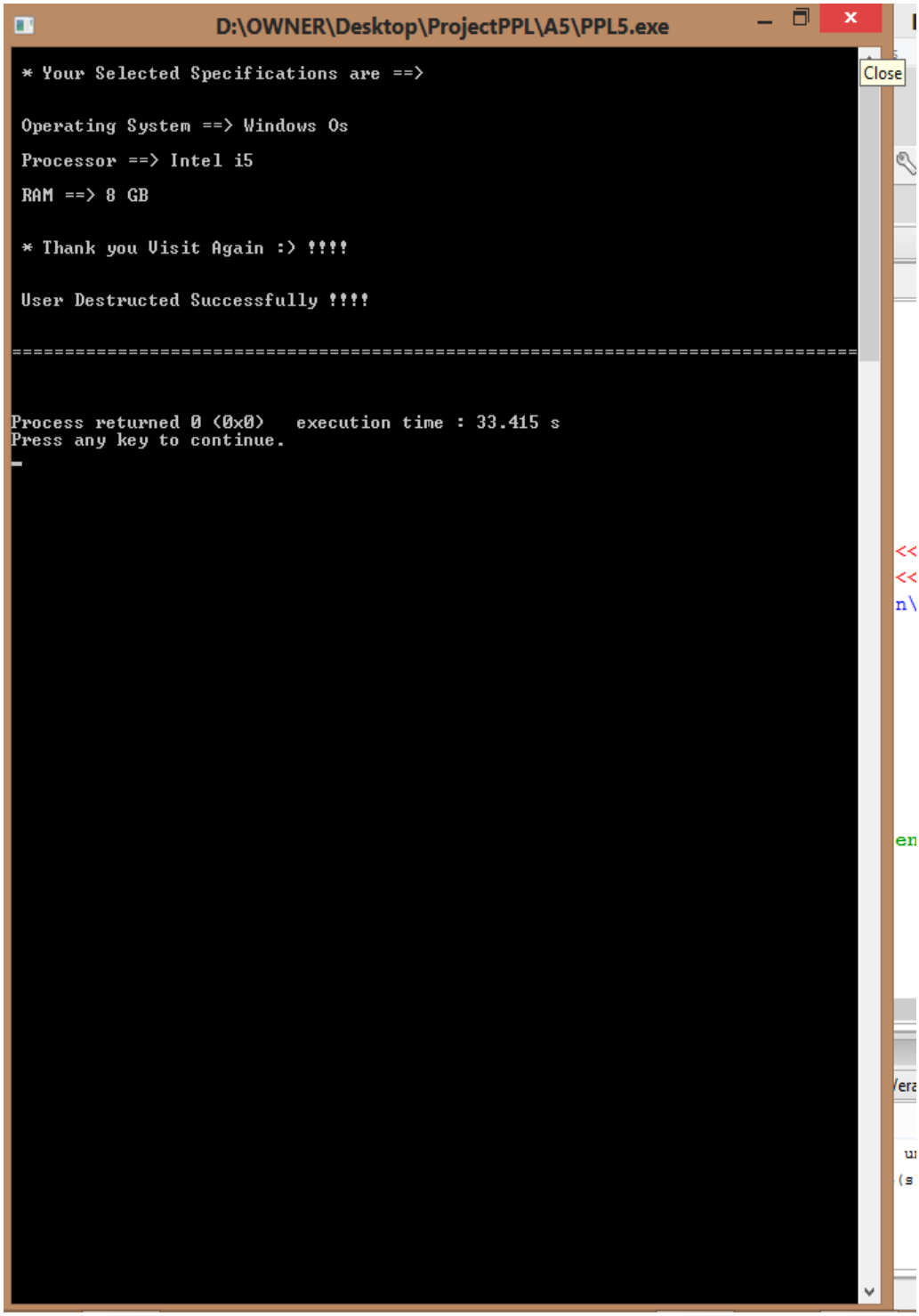
==========

Process returned 0 (0x0)  execution time : 33.415 s

Press any key to continue.

**Screenshots:**






**Conclusion:** Thus studied and applied formatted IO for Laptop Customization system.