Merit-Quality-Excellence

Khairpur Campus of Sukkur IBA University

Introduction to Computer Programming (Fall 2019)

LAB No: 11

Instructor: Marina Gul **Date: 05/12/2019**

Objective of Lab No. 11:

After performing lab 10, students will be able to:

- File Input / Output
- Create structures
- Manipulate Structures
- Use structures with array and functions

Practice 01:

```
#include <iostream>
using namespace std ;

//struct is a keyword and Student is name of my structure
// Actually you are creating your own datatype now
// The name of your datatype will be student

struct Student
{ // Curly bracket to hold structure member variable
   string cms_id ; // strucrure member variable
   string std_name ; // strucrure member variable
   string sub_name ; // strucrure member variable
   float sub_marks ; // strucrure member variable
} ;// end of curly bracket with SEMICOLON
int main ()
 {
  // Creating and using or accessing structure varaibles
  Student std1 = {"123" , "ABC" , "Prog" , 85.5} ;
  Student std2 ;
  std2.cms_id="111" ;
  std2.std_name="XYZ" ;
  std2.sub_name="Prog" ;
  std2.sub_marks=73.5 ;
  cout << std1.cms_id <<endl ;
  cout << std1.std_name <<endl ;
  cout << std1.sub_name <<endl ;
  cout << std1.sub_marks <<endl ;
  cout << std2.cms_id <<endl ;
  cout << std2.std_name <<endl ;
  cout << std2.sub_name <<endl ;
  cout << std2.sub_marks <<endl ;
  system ("PAUSE") ;
  return 0 ;
 }
```

Practice 02:

```
#include <iostream>
using namespace std ;
struct Student
{
 string cms_id ; // Structure Member variable
 string std_name ; // Structure Member variable
 string sub_name ; // Structure Member variable
 float sub_marks ; // Structure Member variable

 void PrintStudentData (void) // Structure Member Function
 { // Strucrure Member Function Definition
  cout << "Student CMS ID : " << cms_id <<endl ;
  cout << "Student Name : " << std_name <<endl ;
  cout << "Subject Name : " << sub_name <<endl ;
  cout << "Subject Marks : " << sub_marks <<endl ;
 }

};


int main ()
{
 // Creating structure variables and using or accessing strucrure member variables
 Student std1 = {"111" , "Mujtaba" , "Programming" , 85.50} ;
 Student std2 = {"222" , "Yousif" , "Programming" , 89.00} ;
 Student std3 = {"333" , "Mohsin" , "Programming" , 80.25} ;

 //Printing the data of students using member function of structure
 std1.PrintStudentData () ;
 std2.PrintStudentData () ;
 std3.PrintStudentData () ;

 system ("PAUSE") ;
 return 0 ;
}
```

Practice 03:

```
#include <iostream>
#include <iomanip>
using namespace std ;
struct Book { string book_title ; float book_price ; };
int main () {
 Book book [5] ;
 book [0].book_title = "C++" ; book [0].book_price = 200.00 ;
 book [1].book_title = "Java" ; book [1].book_price = 300.00 ;
 book [2].book_title = ".NET" ; book [2].book_price = 400.00 ;
 book [3].book_title = "Operating System" ; book [3].book_price = 350.00 ;

 cout <<book [0].book_title << " , " << book[0].book_price <<endl <<endl ;
 cout <<book [1].book_title << " , " << book[1].book_price <<endl <<endl ;
 cout <<book [2].book_title << " , " << book[2].book_price <<endl <<endl ;
 cout <<book [3].book_title << " , " << book[3].book_price <<endl <<endl ;

 cout <<"Enter title of book 5 : " ; cin >> book [4].book_title ;
 cout <<"Enter price of book 5 : " ; cin >> book [4].book_price ;

 system ("PAUSE") ;
 return 0 ;
}
```

Practice 04:

```
#include <iostream>
#include <iomanip>
using namespace std ;
struct Book // Structure
{
 // Structure Member variables
 string book_title ;
 float book_price ;

 // Structure Member functions
 void PrintBookData (void)
 {
  cout << setw (15) ; cout << book_title ;
  cout << setw (35) ; cout << book_price <<endl <<endl <<endl ;
 }
};
```

```
int main ()
{
 Book book [3] ;
 int i ;
 for (int i = 0 ; i <= 2 ; i++)
 {
  cout <<"Enter Book" << i + 1 <<" Title : " ;
  cin >> book [i].book_title ;
  cout <<"Enter Book" << i + 1 <<" Price : " ;
  cin >> book [i].book_price ;
 }

 system ("CLS") ;
 cout <<"================================================================" <<endl ;
 cout << setw (20) ; cout <<"Book Title" ;
 cout << setw (35) ; cout <<"Book Price" <<endl ;
 cout <<"================================================================" <<endl <<endl;

 for (i = 0 ; i <= 2 ; i++)
 {
     book [i].PrintBookData () ;
 }

 system ("PAUSE") ;
 return 0 ;
}
```

Practice 05:

```cpp
#include <iostream>
#include <fstream>
using namespace std;
struct studentType
{
    char firstName[15];
    char lastName[15];
    int ID;
};
int main()
{
    //create and initialize an array of students' IDs
    int studentIDs[5] = {111111, 222222, 333333, 444444, 555555};
    //declare and initialize the struct newStudent
    studentType newStudent = {"John", "Wilson", 777777};
    ofstream outFile;
    outFile.open("F:\\ids.dat", ios::binary);
    outFile.write(reinterpret_cast<const char *> (studentIDs), sizeof(studentIDs));
    outFile.write(reinterpret_cast<const char *> (&newStudent), sizeof(newStudent));
    outFile.close();
    ifstream inFile;
    int arrayID[5];
    studentType student;
    inFile.open("F:\\ids.dat");
    if (!inFile)
    {
    cout << "The input file does not exist. " << "The program terminates!!!!" << endl;
    return 1;
    }
    inFile.read(reinterpret_cast<char *> (arrayID), sizeof(arrayID));
    for (int i = 0; i < 5; i++)
    {
    cout << arrayID[i] << " ";
    }
    cout << endl;
    inFile.read(reinterpret_cast<char *> (&student), sizeof(student));
    cout << student.ID << " " << student.firstName << " " << student.lastName << endl;
    inFile.close();
    return 0;
}
```

Practice 06:

```cpp
#include <iostream>
#include<fstream>
using namespace std;

int main()
{
    ifstream fin;
    fin.open("test.txt");
    if(fin.fail())
    {
        cout << "Input file opening failed.\n";
        exit(1);
    }
    string search;
    cout << "Please enter a name: ";
    cin  >> search;
    bool isFound=0;
    while(!fin.eof())
    {
        string temp = "";
        getline(fin,temp);
        for(int i=0;i<search.size();i++)
        {
            if(temp[i]==search[i])
                isFound = 1;
```

```
26              else
27              {
28                  isFound =0;
29                  break;
30              }
31          }
32
33          if(isFound)
34          {
35              cout << "Name is Found";
36          break;
37          }
38
39      }
40      if(fin.eof()&&(!isFound))
41      {
42          cout << "Name not found!\n";
43      }
44      fin.close();
45      return 0;
46  }
```

Task 01:

Suppose, you have a text file “CustomerData.txt”, your task is to read this text file and write the same data in binary format to a new file called “customer.dat”. Finally, read again the data from newly created “customer.dat” file and print the content of the file on console. You also have to used strut in your program.