BCSL-032 solved assignment july 2017 – January 2018 session

1. (a) Write C++ programs to find the followings:
(i) Area of Circle
(ii) Factorial of a given number

A.1.
(i)Area of Circle

```
#include <iostream>

void main()
{
   float radius, area;

   cout << "Enter the radius of circle : ";
   cin >> radius;
   area = 3.14 * radius * radius;
   cout << "Area of circle with radius " << radius << " is " << area;
}
```

OUTPUT:--

```
Enter the radius of circle : 5

Area of circle with radius 5 is 78.5
```

(ii) Factorial of a given number

```
#include <iostream>


void main()

{

unsigned int n;

 unsigned long long factorial = 1;


 cout << "Enter a positive integer: ";

cin >> n;


  for(int i = 1; i <=n; ++i)
```

```
{

 factorial *= i;

 }


 cout << "Factorial of " << n << " = " << factorial;


}
```

OUTPUT:--

```
Enter a positive integer: 12
Factorial of 12 = 479001600
```

(b) Write a C++ program which create a Vehicle class and derive Car and Bike classes from Vehicle class. All the classes in your program should have proper constructors and methods to display vehicle details. Also use appropriate access specifies in your program.

Ans (b)

```
#ifndef VEHICLE_H
#define VEHICLE_H

#include <iostream>
#include <fstream>
#include <iomanip>
#include <functional>
#include <algorithm>
#include <string>
#include <cstdlib>
#include <sstream>
using namespace std;

//Vehicle Class
class Vehicle {
protected:
 Vehicle myVehicle[9];
 string make;  //make
   string model; // model
   string color;  // color
   int year;  // year
   int mileage;  // miles on car
 string type;  //Type of vehicle
```

```
public:
 //Constructor that will set information for a new car
 void New_vehicle (string a, string b, string c, int d, int e)
 {make = a; model = b; color = c; year = d; mileage = e;}

 Vehicle(); //Default constructor
 Vehicle(string, string, string, int, int, string);
 //mutator and accessor functions
 void setMake(string);
    void setModel(string);
    void setColor(string);
    void setYear(int);
    void setMileage(int);
 void setType(string);

    string getMake();
    string getModel();
    string getColor();
    int getYear();
    int getMileage();
 string getType();

 //Check mileage to see if valid
 void valid_mileage(int);

 //virtual function
 virtual void details() {
 }

};
//Sets to default values
Vehicle::Vehicle() {
 make = " ";
    model = " ";
    color = " ";
    year = 0;
    mileage = 0;
 type = " ";
}

Vehicle::Vehicle(string make, string model, string color, int year, int mileage, string type) {
    Vehicle::make =  make;
    Vehicle::model = model;
    Vehicle::color = color;
    Vehicle::year = year;
    valid_mileage(mileage);
 Vehicle::type = type;
```

```
}

void Vehicle::setMake(string make) {
   Vehicle::make = make;
}

void Vehicle::setModel(string model) {
   Vehicle::model = model;
}

void Vehicle::setColor(string color) {
   Vehicle::color = color;
}

void Vehicle::setYear(int year) {
   Vehicle::year = year;
}

void Vehicle::setMileage(int mileage) {
   valid_mileage(mileage);
}

void Vehicle::setType(string type) {
 Vehicle::type = type;
}

string Vehicle::getMake() {
   return make;
}
string Vehicle::getModel() {
   return model;
}
string Vehicle::getColor() {
   return color;
}
int Vehicle::getYear() {
   return year;
}
int Vehicle::getMileage() {
   return mileage;
}

string Vehicle::getType() {
 return type;
}
```

```
void Vehicle::valid_mileage(int mileage) {
   if (mileage>=0)
      Vehicle::mileage=mileage;
   else {
      Vehicle::mileage=0;
      cout << "WARNING! You have entered invalid mileage!\n";
   }

    Vehicle& getVehicle(int n) {
      return myVehicle[n];
   }
};
```

2. (a) Write a C++ program for matrix multiplication. Multiplication function should notify if the order of the matrix is invalid, using exception.

Ans 2 (a)

```
#include<iostream.h>
#include<conio.h>
#include<process.h>
#include<exception.h>
void matsum()
{
int m, n, i, j, first[10][10], second[10][10], sum[10][10];
try { cout << “Enter the number of rows and columns of matrix “;
cin >> m >> n;
cout << “Enter the elements of first matrix\n”;
if (m>10 || n>10) //exit(0);
throw 1;
}
catch(int)
{ cout<<“subscript invalid”;
}
for ( i = 0 ; i < m ; i++ )
for ( j = 0 ; j < n ; j++ )
cin >> first[i][j];
cout << “Enter the elements of second matrix\n”;
for ( i = 0 ; i < m ;i++ )
for ( j = 0 ; j < n ; j++ )
cin >> second[i][j];
```

```
for ( i = 0 ; i < m ; i++ )
for ( j = 0 ; j < n ; j++ )
sum[i][j] = first[i][j] + second[i][j];
cout << “Sum of entered matrices:-\n”;
for ( i = 0 ; i < m ; i++ )
{
for ( j = 0 ; j < n ; j++ )
cout << sum[i][j] << “\t”;
cout << endl;
}
}
void main()
{
matsum();
getch();
}
```

(b) Write C++ program to create a file and store students address and contact details in it.

Ans (b)

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

struct student
{
   char name[50];
   int roll;
   float marks;
  char address[50];
  int mob_no;


} s[10];

int main()
{
   cout << "Enter information of students: " << endl;

   // storing information
   for(int i = 0; i < 10; ++i)
   {
      s[i].roll = i+1;
      cout << "For roll number" << s[i].roll << "," << endl;
```

```
      cout << "Enter name: ";
      cin >> s[i].name;

      cout << "Enter marks: ";
      cin >> s[i].marks;

cout << "Enter address: ";
      cin >> s[i].address;

cout << "Enter mobile number: ";
      cin >> s[i].mob_no;

      cout << endl;

   }

   cout << "Displaying Information: " << endl;

   // Displaying information
   for(int i = 0; i < 10; ++i)
   {
      cout << "\nRoll number: " << i+1 << endl;
      cout << "Name: " << s[i].name << endl;
      cout << "Marks: " << s[i].marks << endl;
        cout << "Address: " << s[i].address<< endl;
      cout << "Mobile Number : " << s[i].mob_no<< endl;

   }

   return 0;

}
```

Output

Enter information of students:
For roll number1,
Enter name: ram
Enter marks: 85
Enter Address : delhi
Enter Mobile Number : 1234567890
For roll number2,
Enter name: rakesh
Enter marks: 85
Enter Address : delhi
Enter Mobile Number : 8976543210
Displaying Information:
Roll number: 1
Name: ram

Marks: 85
Address : delhi
Mobile No : 9876543210