ASSIGNMENT 4

1. Write a program using Array of Objects to display area of multiple rectangles.

Code:

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

class rec
{
private:
    int I;
    int b;

public:
    rec(int a, int c)
    {
        I = a;
        b = c;
    }
    void put()
    {
        cout << "Area is : " << I * b << endl;
    }
};
int main()
{
    rec obj[3] = {rec(3, 6), rec(2, 5), rec(5, 5)};
    cout << "Displaying Areas of Rectangles : \n";
    for (int i = 0; i < 3; i++)
        obj[i].put();

    return 0;
}
```

Output:

```
Displaying Areas of Rectangles :
Area is : 18
Area is : 10
Area is : 25
```

2. Write a program to create a class that contain the following properties of Employees. All the properties should be private and any access to input and display employee data should be through public functions. Input the number of employees to maintain from user and initialize employees the array of objects.

private:	Employee Id	int
	Employee Name	char array
	Employee Age	int
	Employee Salary	Int
public:	inputInfo()	void (return type)
	displayInfo	void (return type)

Code:

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

class Employee
{
private:
    int employee_id;
    char employee_name[100];
    int employee_age;
    long int employee_salary;

public:
    void inputInfo()
    {
        cout << "Enter the Employee Id" << endl;
        cin >> employee_id;
        cout << "Enter the Employee name" << endl;
        cin >> employee_name;
        cout << "Enter the Employee age" << endl;
        cin >> employee_age;
        cout << "Enter the Employee salary" << endl;
        cin >> employee_salary;
    }
    void displayInfo()
    {
        cout << "Employee Id:" << employee_id << endl;
        cout << "Employee Name:" << employee_name << endl;
        cout << "Employee age:" << employee_age << endl;
        cout << "Employee salary:" << employee_salary << endl;
    }
};
int main()
{
    int i, n;


    cout << "Enter the no. of employees" << endl;
    cin >> n;
    Employee emp[n];
    for (i = 0; i < n; i++)
    {
        cout<<"Enter the details of employee  "<<i+1<<endl;
        emp[i].inputInfo();
    }
    cout << "Details of Employees are:" << endl;
    for (i = 0; i < n; i++)
    {
        cout << "Employee " << i + 1 << endl;
        emp[i].displayInfo();
    }

    return 0;
}
```

Output:

```
D:\Cpp programs>cd "d:\Cpp programs\" && g++ 242.cpp -o 242 && "d:\Cpp programs\"242
Enter the no. of employees
3
Enter the details of employee  1
Enter the Employee Id
1
Enter the Employee name
Paravpreet
Enter the Employee age
19
Enter the Employee salary
100000000
Enter the details of employee  2
Enter the Employee Id
2
Enter the Employee name
Ishaan
Enter the Employee age
18
Enter the Employee salary
100000
Enter the details of employee  3
Enter the Employee Id
3
Enter the Employee name
Sarthak
Enter the Employee age
18
Enter the Employee salary
10000000
Details of Employees are:
Employee 1
Employee Id:1
Employee Name:Paravpreet
Employee age:19
Employee salary:100000000
Employee 2
Employee Id:2
Employee Name:Ishaan
Employee age:18
Employee salary:100000
Employee 3
Employee Id:3
Employee Name:Sarthak
Employee age:18
Employee salary:10000000
```

3. Write a C++ Program to demonstrate the following uses of *this* pointer:
    - Returning Object

      Code:

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

class Test
{
private:
  int x;
  int y;
public:
  Test(int x = 0, int y = 0) { this->x = x; this->y = y; }
  Test &setX(int a) { x = a; return *this; }
  Test &setY(int b) { y = b; return *this; }
  void print() { cout << "x = " << x << " y = " << y << endl; }
};

int main()
{
  Test obj1(5, 5);

  obj1.setX(10).setY(20);

  obj1.print();
  return 0;
}
```

Output:

```
D:\Cpp programs>cd "d:\Cpp programs\" && g++ 243a.cpp -o 243a && "d:\Cpp programs\"
x = 10 y = 20
```

- Distinguishing Data Members

  Code:

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

class Test
{
private:
    int x;

public:
    void setX(int x)
    {

        this->x = x;
    }
    void print() { cout << "x = " << x << endl; }
};

int main()
{
    Test obj;
    int x = 20;
    obj.setX(x);
    obj.print();
    return 0;
}
```

Output:

```
D:\Cpp programs>cd "d:\Cpp programs\" && g++ 243a.cpp -o 243a && "d:\Cpp programs\"243a
x = 20
```

4. Write a C++ program to create dynamic array of integers using new and find the smallest element in the array.

Code:

```cpp
#include <iostream>
using namespace std;
int main()
{
    int i, n, s;
    cout << "Enter total number of elements:"
         << "\n";
    cin >> n;
    int *a = new int(n);
    cout << "Enter " << n << " elements" << endl;
    for (i = 0; i < n; i++)
    {
        cin >> a[i];
    }
    s = a[0];
    for (i = 1; i < n; i++)
    {
        if (s > a[i])
            s = a[i];
    }
    cout << "\nSmallest Number = " << s;
    cout << endl;
    delete (a);
    return 0;
}
```

Output:

```
D:\Cpp programs>cd "d:\Cpp programs\" && g++ 244.cpp -o 244 && "d:\Cpp programs\"244
Enter total number of elements:
3
Enter 3 elements
1
7
8
```

5. Modify program 2 to demonstrate the use of dynamic constructor using *new* keyword.

Code:

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

class Employee
{
public:
    int *employee_id;
    char *employee_name;
    int *employee_age;
    int *employee_salary;

    Employee()
    {
        employee_name = new char[100];
        employee_id=new int;
        *employee_id=0;
        employee_age=new int;
        *employee_age=0;
        employee_salary=new int;
        *employee_salary=0;
    }

    void inputInfo()
    {
        cout << "Enter the Employee Id" << endl;
        cin >> *employee_id;
        cout << "Enter the Employee name" << endl;
        cin >> employee_name;
        cout << "Enter the Employee age" << endl;
        cin >> *employee_age;
        cout << "Enter the Employee salary" << endl;
        cin >> *employee_salary;
    }
    void displayInfo()
    {
        cout << "Employee Id:" << *employee_id << endl;
        cout << "Employee Name:" << *employee_name << endl;
        cout << "Employee age:" << *employee_age << endl;
        cout << "Employee salary:" << *employee_salary << endl;
    }
};
int main()
{
    int i, n;

    cout << "Enter the no. of employees" << endl;
    cin >> n;
    Employee emp[n];
    for (i = 0; i < n; i++)
    {
        cout << "Enter the details of employee  " << i + 1 << endl;
        emp[i].inputInfo();
    }
    cout << "Details of Employees are:" << endl;
    for (i = 0; i < n; i++)
    {
        cout << "Employee " << i + 1 << endl;
        emp[i].displayInfo();
    }

    return 0;
}
```

Output:

```
D:\Cpp programs>.\a.exe
Enter the no. of employees
2
Enter the details of employee  1
Enter the Employee Id
1
Enter the Employee name
Parav
Enter the Employee age
19
Enter the Employee salary
10000000000000000
Enter the details of employee  2

D:\Cpp programs>.\a.exe
Enter the no. of employees
2
Enter the details of employee  1
Enter the Employee Id
1
Enter the Employee name
Parav
Enter the Employee age
19
Enter the Employee salary
100000
Enter the details of employee  2
Enter the Employee Id
2
Enter the Employee name
Sarthak
Enter the Employee age
18
Enter the Employee salary
100000
Details of Employees are:
Employee 1
Employee Id:1
Employee Name:P
Employee age:19
Employee salary:100000
Employee 2
Employee Id:2
Employee Name:S
Employee age:18
Employee salary:100000

D:\Cpp programs>
```