OOPS ASSIGNMENT

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CLASS – S.E. COMP I

ROLL-NO : 23B-CO-010

GOA COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

SUBJECT: - OOPS

FACULTY: - Prof. AMIT P. PATIL **CLASS: - SE Comp (III)**

PLATFORM: - Dev C++/VS 2010 **YEAR: - 1-7-24 to 12/11/24**

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Assignment No 1

1. Write a C++ program to create an employee database using structures concept. Take employee record attributes as employee name, employee-id, employee-address. Prompt the user to enter the number 'n' as total number of employees in database. Iteratively enter all the 'n' employee records. Search for an employee record based on employee-id and employee-address and display the specific record.

2. 3.10 *An electricity board charges the following rates to domestic users to discourage large consumption of energy:*

   For the first 100 units - 60P per unit

   For next 200 units - 80P per unit

   Beyond 300 units - 90P per unit

   All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300.00 then an additional surcharge of 15% is added.

   Write a program to read the names of users and number of units consumed and print out the charges with names.

3. Write a C++ program to print a Fibonacci triangle

   1
   1 1
   1 1 2
   1 1 2 3
   1 1 2 3 5 and so on

4. Write a C++ Program to interchange diagonals of a matrix (2D Array)

1. Write a C++ program to create an employee database using structures concept. Take
employee record attributes as employee name, employee-id, employee-address. Prompt the
user to enter the number ‘n’ as total number of employees in database. Iteratively enter all the
‘n’ employee records. Search for an employee record based on employee-id and
employee-address and display the specific record.

Input --

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

struct employee {
    string ename;
    int eid ;
    string eaddress ;
};

int main (){
   int n;
    cout << "Enter the number of employees ";
    cin>>n;
     cin.ignore();
    struct employee e[100];
for (int i=0;i<n;i++){

    cout << "Enter the  name of the employee"<<endl ;
    getline(cin,e[i].ename);

    cout << "Enter the ID number of the employee"<<endl ;
    cin>>e[i].eid ;
    cin.ignore();
    cout << "Enter the address of the employee"<<endl ;
    getline(cin,e[i].eaddress);

}cout<<endl ;

for (int i=0;i<n;i++){
cout<<"-----------------EMPLOYEE RECORD-------------------------------------
-"<<endl ;
cout<<"Employee name -> "<<e[i].ename<<endl ;
cout<<"Employee ID -> "<<e[i].eid <<endl ;
```

```
cout<< "Employee Address --> "<<e[i].eaddress<<endl ;
cout << endl ;
}
    int searchId;
    string searchAddress;
    cout << "Enter the ID of the employee you want to search: ";
    cin >> searchId;
    cin.ignore();
    cout << "Enter the address of the employee you want to search: ";
    getline(cin, searchAddress);

    bool found = false;
    for (int i = 0; i < n; i++) {
        if (e[i].eid == searchId && e[i].eaddress == searchAddress) {
            cout << "-----------------EMPLOYEE RECORD FOUND-------------------
---------------------" << endl;
            cout << "Employee name -> " << e[i].ename << endl;
            cout << "Employee ID -> " << e[i].eid << endl;
            cout << "Employee Address --> " << e[i].eaddress << endl;
            cout << endl;
            found = true;
            break;
        }
    }

    if (!found) {
        cout << "No employee record found with the given ID and address." <<
endl;
    }

    return 0;
}
```

OUTPUT –

```
Enter the number of employees 4
Enter the  name of the employee
Ravi Pandey
Enter the ID number of the employee
50120010
Enter the address of the employee
Pune,Maharashtra,India
Enter the  name of the employee
Sheeraz Shaik
Enter the ID number of the employee
50120011
Enter the address of the employee
Bengaluru,Karnataka,India
Enter the  name of the employee
Vijay Naidu
Enter the ID number of the employee
50120012
Enter the address of the employee
Chennai,Tamil Nadu,India
Enter the  name of the employee
Shreyanshu Verekar
Enter the ID number of the employee

50120013
Enter the address of the employee
Ponda,Goa,India
```

```
----------------EMPLOYEE RECORD----------------------------------------
Employee name -> Ravi Pandey
Employee ID -> 50120010
Employee Address --> Pune,Maharashtra,India

----------------EMPLOYEE RECORD----------------------------------------
Employee name -> Sheeraz Shaik
Employee ID -> 50120011
Employee Address --> Bengaluru,Karnataka,India

----------------EMPLOYEE RECORD----------------------------------------
Employee name -> Vijay Naidu
Employee ID -> 50120012
Employee Address --> Chennai,Tamil Nadu,India

----------------EMPLOYEE RECORD----------------------------------------
Employee name -> Shreyanshu Verekar
Employee ID -> 50120013
Employee Address --> Ponda,Goa,India

Enter the ID of the employee you want to search: 50120012
Enter the address of the employee you want to search: Chennai,Tamil Nadu,India
----------------EMPLOYEE RECORD FOUND----------------------------------
Employee name -> Vijay Naidu
Employee ID -> 50120012
Employee Address --> Chennai,Tamil Nadu,India
```

2. An electricity board charges the following rates to domestic users to discourage large consumptionof energy:
For the first 100 units --60P per unit
For next 200 units --80P per unit
Beyond 300 units -- 90P per unit
All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300.00 then an additional surcharge of 15% is added.
Write a program to read the names of users and number of units consumed and print out the charges with names.

Input—

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

struct consumer {
    string name;
    int bl;
    float bill;
};

float elecbilla(int units);
float elecbillb(int units);
float elecbillc(int units);

int main() {
    struct consumer s[3];

    for (int i = 0; i < 3; i++) {
        cout << "Enter the name of the user \n";
        getline(cin, s[i].name);
        cout << "Enter the units of energy consumed by the user \n";
        cin >> s[i].bl;

        cin.ignore();

        if (s[i].bl <= 100) {
            s[i].bill = elecbilla(s[i].bl);
        } else if (s[i].bl > 100 && s[i].bl <= 300) {
            s[i].bill = elecbillb(s[i].bl);
        } else if (s[i].bl > 300) {
            s[i].bill = elecbillc(s[i].bl);
        }
```

```
        if (s[i].bill > 300) {
            s[i].bill += (0.15 * s[i].bill);
        }
    }

    for (int i = 0; i < 3; i++) {
        cout << "==============Electricity Bill=======================" << endl;
        cout << "Mr " << s[i].name << endl;
        cout << "Units of Electricity consumed  " << s[i].bl << endl;
        cout << "Charge Rs. " << s[i].bill << endl;
        cout << "============================================================" <<
endl;
        cout << endl;
    }
    return 0;
}

float elecbilla(int units) {
    float bill = (units * 0.60) + 50;
    return bill;
}

float elecbillb(int units) {
    int un = units - 100;
    float bill = (100*0.60) + (un * 0.80);
    return bill;
}

float elecbillc(int units) {
    int un = units - 300;
    float bill = (100 * 0.60) + (200 * 0.80) + (un * 0.90);
    return bill;
}
```

Output—

```
Enter the name of the user
Ashish Thakur
Enter the units of energy consumed by the user
432
Enter the name of the user
Viraj Patwa
Enter the units of energy consumed by the user
189
Enter the name of the user
Saurabh Chakraborti
Enter the units of energy consumed by the user
678
==============Electricity Bill=======================
Mr Ashish Thakur
Units of Electricity consumed  432
Charge Rs. 389.62
=====================================================

==============Electricity Bill=======================
Mr Viraj Patwa
Units of Electricity consumed  189
Charge Rs. 131.2
=====================================================

==============Electricity Bill=======================
Mr Saurabh Chakraborti
Units of Electricity consumed  678
Charge Rs. 644.23
=====================================================
```

3. Write a C++ program to print a Fibonacci triangle
1
1 1
1 1 2
1 1 2 3
1 1 2 3 5 and so on

Input—

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

int main (){
int i,j,k,n,first,second,next ;
cout << "Enter the number of rows of the fibonacci pattern needed"<<endl ;
cin>>n;
cout<<"Pattern"<<endl ;

for(i=0;i<n;i++){
    next = 0;
    first=0 ;
    second =1 ;
    for(j=0;j<=i;j++){

            if(j==0){
                cout<<" "<<second;}
            else {
                next = first + second;
              first = second;
              second = next ;
                 cout<<" "<<next;

            } }
        cout<<endl ;   }}
```

Output –

```
Enter the number of rows of the fibonacci pattern needed
8
Pattern
 1
 1 1
 1 1 2
 1 1 2 3
 1 1 2 3 5
 1 1 2 3 5 8
 1 1 2 3 5 8 13
 1 1 2 3 5 8 13 21
```

4. Write a C++ Program to interchange diagonals of a matrix (2D Array)

Input –

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

int main(){
int i,j;
cout<<"Enter the number of rows and columns in the matrix"<<endl;
cin>>i;
cin>>j;
 if (i != j) {
        cout << "Matrix must be square to interchange diagonals." << endl;
        return 1;
    }
int arr[10][10] ;
cout<<"Enter the elements of the matrix\n";
for(int a=0;a<i;a++){
    for (int b=0;b<j;b++){
        cin>>arr[a][b];
    }
}
cout << "The elements of the matrix are \n";
for(int a=0;a<i;a++){
    for (int b=0;b<j;b++){
            cout<<" "<<arr[a][b];}
    cout<<endl ;
}


for (int a =0;a<3;a++){
        int c = arr[a][a] ;
      arr[a][a] = arr[a][i-a-1];
      arr [a][i-a-1] = c ;

}
cout << "The elements of the matrix after diagonal interchanging are \n";
for(int a=0;a<i;a++){
    for (int b=0;b<j;b++){
            cout<<" "<<arr[a][b];}
    cout<<endl ;
}

    return 0;
}
```

Output –

```
Enter the number of rows and columns in the matrix
3
3
Enter the elements of the matrix
1
2
3
4
5
6
7
8
9
The elements of the matrix are
 1 2 3
 4 5 6
 7 8 9
The elements of the matrix after diagonal interchanging are
 3 2 1
 4 5 6
 9 8 7
```