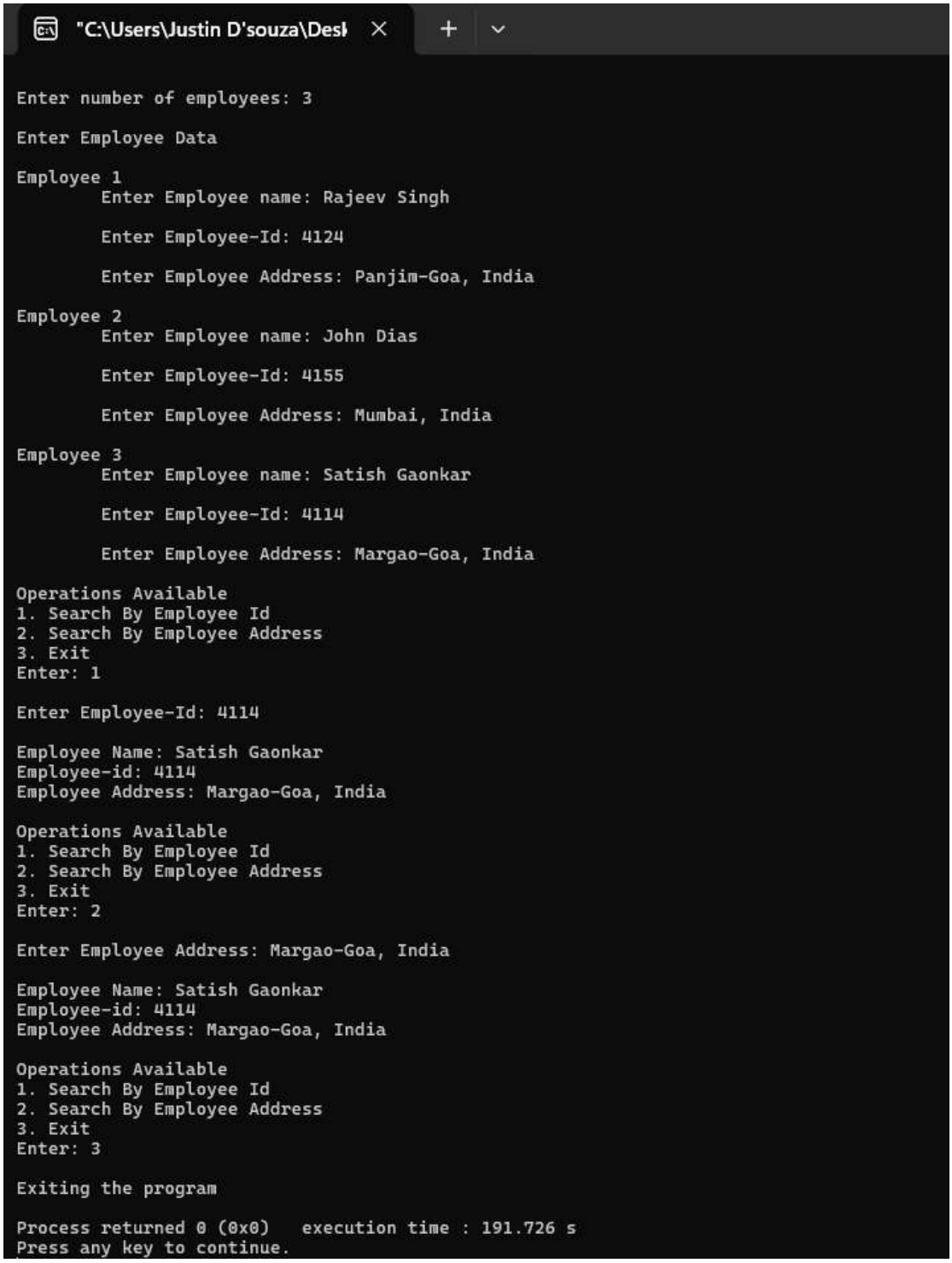
1. Write a C++ program to create an employee database using structures concept.

```
#include <iostream>
#include <string>
using namespace std;
struct employee {
   string name, address;
   int id;
};
int main() {
   int n, c;
   cout << "\nEnter number of employees: ";
   cin >> n;
   cin.ignore();
   struct employee e[n];
   cout << "\nEnter Employee Data\n";
   for (int i = 0; i < n; i++) {
      cout << "\nEmployee " << i + 1;
      cout << "\n\tEnter Employee name: ";
      getline(cin, e[i].name);
      cout << "\n\tEnter Employee-Id: ";
      cin >> e[i].id;
      cin.ignore();
      cout << "\n\tEnter Employee Address: ";
      getline(cin, e[i].address);
   }
   int flag, se;
```

```
    string add;
    do {
        flag = 0;
        cout << "\nOperations Available\n1. Search By Employee Id\n2. Search By Employee
Address\n3. Exit\nEnter: ";
        cin >> c;
        cin.ignore();
        switch(c) {
            case 1:
                cout << "\nEnter Employee-Id: ";
                cin >> se;
                for (int i = 0; i < n; i++) {
                    if (e[i].id == se) {
                        cout << "\nEmployee Name: " << e[i].name
                            << "\nEmployee-id: " << e[i].id
                            << "\nEmployee Address: " << e[i].address << endl;
                        flag = 1;
                        break;
                    }
                }
                if (!flag) {
                    cout << "\nEmployee Not Found\n";
                }
                break;
            case 2:
                cout << "\nEnter Employee Address: ";
```

```
            getline(cin, add);
            for (int i = 0; i < n; i++) {
               if (e[i].address == add) {
                  cout << "\nEmployee Name: " << e[i].name
                     << "\nEmployee-id: " << e[i].id
                     << "\nEmployee Address: " << e[i].address << endl;
                  flag = 1;
                  break;
               }
            }
            if (!flag) {
               cout << "\nEmployee Not Found\n";
            }
            break;
         case 3:
            cout << "\nExiting the program\n";
            exit(0);
         default:
            cout << "\nInvalid choice\n";
      }
   } while (1);
   return 0;
}
```



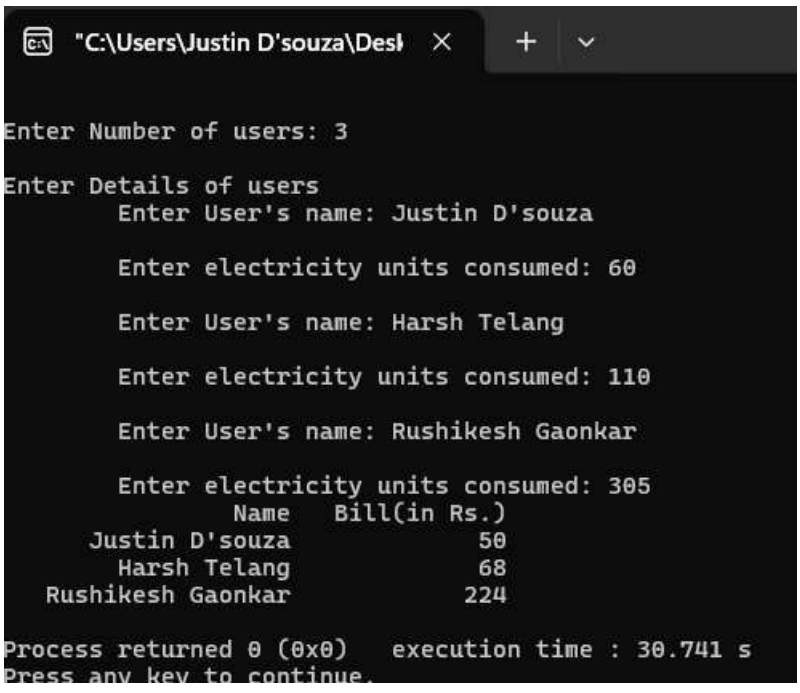
2. Write a Program to read names of users and units consumed and print out the charges with the names

```
#include <iostream>

#include <iomanip>
```

```
using namespace std;
struct user {
   string name;
   unsigned int units;
};
float calc(int info);
int main() {
   int n;
   cout << "\nEnter Number of users: ";
   cin >> n;
   cin.ignore();
   user u[n];
   cout << "\nEnter Details of users";
   for (int i = 0; i < n; i++) {
      cout << "\n\tEnter User's name: ";
      getline(cin, u[i].name);
      cout << "\n\tEnter electricity units consumed: ";
      cin >> u[i].units;
      cin.ignore();
   }
   cout << setw(20) << "Name" << setw(15) << "Bill(in Rs.)" << endl;
   for (int i = 0; i < n; i++) {
      cout << setw(20) << u[i].name << setw(15) <<setprecision(3)<<calc(u[i].units) << endl;
   }
   return 0;
}
```

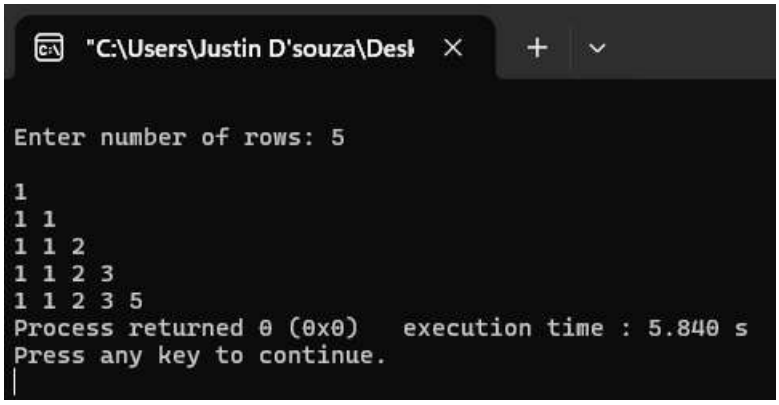
```
float calc(int info) {
   float bill;
   if (info <= 100)
      bill = info * 60 / 100;
   else if (info <= 300)
      bill = ((100 * 60) + ((info - 100) * 80)) / 100;
   else
      bill = ((100 * 60) + (200 * 80) + ((info - 300) * 90)) / 100;
   if (bill < 50)
      bill = 50;
   else if (bill > 300)
      bill += (bill * 0.15);
   return bill;
}
```



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

```
#include <iostream>
```

```
using namespace std;
int main() {
   int r;
   cout << "\nEnter number of rows: ";
   cin >> r;
   if (r >= 1) {
      for (int i=1; i <= r;i++){
         int a=1, b = 1, temp;
         cout << endl<< a << " ";
         if (i > 1){
            cout<<b<< " ";
         }
         for (int j=3; j<=i;j++) {
            temp=a+b;
            a=b;
            b=temp;
            cout<<temp<<" ";
         }
      }
   }
   else{
      cout<<"\nRows should be atleast greater than or equal to 1";
   }
   return 0;
}
```



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

```
#include <iostream>

using namespace std;

int main(){

   int n;

   cout << "Enter the size of the matrix (n x n): ";

   cin >> n;

   int m[n][n],temp;

   cout << "Enter the elements of the matrix:" << endl;

   for (int i = 0; i < n; ++i) {

      for (int j = 0; j < n; ++j) {

         cin >> m[i][j];

      }

   }

   cout << "Original matrix:" << endl;

   for (int i = 0; i < n; ++i) {

      for (int j = 0; j < n; ++j) {

         cout<<m[i][j]<<"\t";

      }

      cout<<endl;
```

```
    }
    cout<<"\nMatrix After Diagonals Interchanged:\n";
    for(int i=0;i<n;i++){
        temp=m[i][i];
        m[i][i]=m[i][n-i-1];
        m[i][n-i-1]=temp;
    }
    for (int i = 0; i < n; ++i) {
        for (int j = 0; j < n; ++j) {
            cout<<m[i][j]<<"\t";
        }
        cout<<endl;
    }
    return 0;
}
```