Experiment No. 1:

INSERTION SORT

* *Source Code:*

//Insertion Sorting using DSA Algorithm

#include<iostream>

#include<fstream>

using namespace std;

void Insertion\_Sort(int array[],int n)

{

cout<<"The Entered Array : ["<<array[0];

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

{

  cout<<", "<<array[i];

}

cout<<" ]"<<endl;

int count = 0;

for(int j=1;j<n;j++)

{

  int key = array[j];

  int i=j-1;

  while(i>=0 and array[i]>key)

  {

   array[i+1] = array[i];

   i=i-1;

   count += 1;

  }

   array[i+1] = key;

   count += 1;

}

cout<<"The Sorted Array : ["<<array[0];

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

{

  cout<<", "<<array[i];

}

cout<<" ]"<<endl;

cout<<"Total No. of Comparisons : "<<count<<endl;

ofstream fout;

fout.open("OutputFile.txt");

fout<<n<<"\t";

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

{

  fout<<"\t"<<array[i];

}

fout<<"\t\t"<<count;

fout.close();

cout<<"Output written in File Successfully !!"<<endl;

}

int main()

{

int choice =0;

while (choice != 5)

{

  cout<<"1. Random Input "<<endl;

  cout<<"2. Ascending Order Input  "<<endl;

  cout<<"3. Descending Order Order Input  "<<endl;

  cout<<"4. Equal Input  "<<endl;

  cout<<"5. To Exit"<<endl;

  cout<<"Enter Your Choice : "<<endl;

  cin>>choice;

  int n;

  cout<<"Enter the Total No. fo Elements : "<<endl;

  cin>>n;

  int a[n];

  if(choice == 1)

  {

   ifstream fin;

   fin.open("input.txt");

   for(int i=0;i<n;i++)

   {

    fin>>a[i];

   }

   fin.close();

   Insertion\_Sort(a,n);

  }

  else if (choice == 2)

  {

   ifstream fin;

   fin.open("input-asc.txt");

   for(int i=0;i<n;i++)

   {

    fin>>a[i];

   }

   fin.close();

   Insertion\_Sort(a,n);

  }

  else if(choice == 3)

  {

   ifstream fin;

   fin.open("input-desc.txt");

   for(int i=0;i<n;i++)

   {

    fin>>a[i];

   }

   fin.close();

   Insertion\_Sort(a,n);

  }

  else if(choice == 4)

  {

   ifstream fin;

   fin.open("input-equal.txt");

   for(int i=0;i<n;i++)

   {

    fin>>a[i];

   }

   fin.close();

   Insertion\_Sort(a,n);

  }

  else if(choice == 5)

  {

   break;

  }

  else

  {

   cout<<"Invalid Input Please ry Again"<<endl;

  }

}

return 0;

}

* *Output*