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Program for performing various operations on

Index Sequential File organisation.

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#include<iostream>

#include<stdlib.h>

#include<fstream>

#include<string.h>

#include<iomanip>

using namespace std;

class EMP\_CLASS

{

typedef struct EMPLOYEE

{

char name[10];

int emp\_id;

int salary;

}Rec;

typedef struct INDEX

{

int emp\_id;

int position;

}Ind\_Rec;

Rec Records;

Ind\_Rec Ind\_Records;

public:

EMP\_CLASS()//constructor

{

strcpy(Records.name,"");

}

void Create();

void Display();

void Delete();

void Add();

void Search();

};

void EMP\_CLASS::Create()

{

int i,j;

char ch='y';

fstream seqfile;

fstream indexfile;

i=0;

indexfile.open("IND.DAT",ios::out|ios::binary);

seqfile.open("EMP.DAT",ios::out|ios::binary);

do

{

cout<<"\n Enter Name: ";

cin>>Records.name;

cout<<"\n Enter Emp\_ID: ";

cin>>Records.emp\_id;

cout<<"\n Enter Salary: ";

cin>>Records.salary;

seqfile.write((char\*)&Records,sizeof(Records))<<flush;

Ind\_Records.emp\_id=Records.emp\_id;

Ind\_Records.position=i;

indexfile.write((char\*)&Ind\_Records,sizeof(Ind\_Records))<<flush;

i++;

cout<<"\nDo you want to add more records?";

cin>>ch;

}while(ch=='y');

seqfile.close();

indexfile.close();

}

void EMP\_CLASS::Display()

{

fstream seqfile;

fstream indexfile;

int n,i,j;

seqfile.open("EMP.DAT",ios::in|ios::binary);

indexfile.open("IND.DAT",ios::in|ios::binary);

indexfile.seekg(0,ios::beg);

seqfile.seekg(0,ios::beg);

cout<<"\n The Contents of file are ..."<<endl;

i=0;

while(indexfile.read((char \*)&Ind\_Records,sizeof(Ind\_Records)))

{

i=Ind\_Records.position\*sizeof(Rec);//getting pos from index file

seqfile.seekg(i,ios::beg);//seeking record of that pos from seq.file

seqfile.read((char \*)&Records,sizeof(Records));//reading record

if(Records.emp\_id!=-1)//if rec. is not deleted logically

{ //then display it

cout<<"\nName: "<<Records.name<<flush;

cout<<"\nEmp\_ID: "<<Records.emp\_id;

cout<<"\nSalary: "<<Records.salary;

cout<<"\n";

}

}

seqfile.close();

indexfile.close();

}

void EMP\_CLASS::Delete()

{

int id,pos;

cout<<"\n For deletion,";

cout<<"\n Enter the Emp\_ID for for searching ";

cin>>id;

fstream seqfile;

fstream indexfile;

seqfile.open("EMP.DAT",ios::in|ios::out|ios::binary);

indexfile.open("IND.DAT",ios::in|ios::out|ios::binary);

seqfile.seekg(0,ios::beg);

indexfile.seekg(0,ios::beg);

pos=-1;

//reading index file for getting the index

while(indexfile.read((char \*)&Ind\_Records,sizeof(Ind\_Records)))

{

if(id==Ind\_Records.emp\_id) //desired record is found

{

pos=Ind\_Records.position;

Ind\_Records.emp\_id=-1;

break;

}

}

if(pos==-1)

{

cout<<"\n The record is not present in the file";

return;

}

//calculating the position of record in seq. file using the pos of ind. file

int offset=pos\*sizeof(Rec);

seqfile.seekp(offset);//seeking the desired record for deletion

strcpy(Records.name,"");

Records.emp\_id=-1; //logical deletion

Records.salary=-1; //logical deletion

seqfile.write((char\*)&Records,sizeof(Records))<<flush;//writing deleted status

//From index file also the desired record gets deleted as follows

offset=pos\*sizeof(Ind\_Rec);//getting position in index file

indexfile.seekp(offset); //seeking that record

Ind\_Records.emp\_id=-1; //logical deletion of emp\_id

Ind\_Records.position=pos;//position remain unchanged

indexfile.write((char\*)&Ind\_Records,sizeof(Ind\_Records))<<flush;

seqfile.seekg(0);

indexfile.close();

seqfile.close();

cout<<"\n The record is Deleted!!!";

}

void EMP\_CLASS::Add()

{

fstream seqfile;

fstream indexfile;

int pos;

indexfile.open("IND.DAT",ios::in|ios::binary);

indexfile.seekg(0,ios::end);

pos=indexfile.tellg()/sizeof(Ind\_Records);

indexfile.close();

indexfile.open("IND.DAT",ios::app|ios::binary);

seqfile.open("EMP.DAT",ios::app|ios::binary);

cout<<"\n Enter the record for appending";

cout<<"\nName: ";cin>>Records.name;

cout<<"\nEmp\_ID: ";cin>>Records.emp\_id;

cout<<"\nSalary: ";cin>>Records.salary;

seqfile.write((char\*)&Records,sizeof(Records));//inserting rec at end in seq. file

Ind\_Records.emp\_id=Records.emp\_id; //inserting rec at end in ind. file

Ind\_Records.position=pos; //at calculated pos

indexfile.write((char\*)&Ind\_Records,sizeof(Ind\_Records))<<flush;

seqfile.close();

indexfile.close();

cout<<"\n The record is Appended!!!";

}

void EMP\_CLASS::Search()

{

fstream seqfile;

fstream indexfile;

int id,pos,offset;

cout<<"\n Enter the Emp\_ID for searching the record ";

cin>>id;

indexfile.open("IND.DAT",ios::in|ios::binary);

pos=-1;

//reading index file to obtain the index of desired record

while(indexfile.read((char \*)&Ind\_Records,sizeof(Ind\_Records)))

{

if(id==Ind\_Records.emp\_id)//desired record found

{

pos=Ind\_Records.position;//seeking the position

break;

}

}

if(pos==-1)

{

cout<<"\n Record is not present in the file";

return;

}

//calculate offset using position obtained from ind. file

offset=pos\*sizeof(Records);

seqfile.open("EMP.DAT",ios::in|ios::binary);

//seeking the record from seq. file using calculated offset

seqfile.seekg(offset,ios::beg);//seeking for reading purpose

seqfile.read((char \*)&Records,sizeof(Records));

if(Records.emp\_id==-1)

{

cout<<"\n Record is not present in the file";

return;

}

else //emp\_id=desired record’s id

{

cout<<"\n The Record is present in the file and it is...";

cout<<"\n Name: "<<Records.name;

cout<<"\n Emp\_ID: "<<Records.emp\_id;

cout<<"\n Salary: "<<Records.salary;

}

seqfile.close();

indexfile.close();

}

int main()

{

EMP\_CLASS List;

char ans='y';

int choice,key;

do

{

cout<<"\n Main Menu "<<endl;

cout<<"\n 1.Create";

cout<<"\n 2.Display";

cout<<"\n 3.Delete";

cout<<"\n 4.Add";

cout<<"\n 5.Search";

cout<<"\n 6.Exit";

cout<<"\n Enter your choice: ";

cin>>choice;

switch(choice)

{

case 1:List.Create();

break;

case 2:List.Display();

break;

case 3:List.Delete();

break;

case 4:List.Add();

break;

case 5:List.Search();

break;

case 6:exit(0);

}

cout<<"\n\t Do you want to go back to Main Menu?";

cin>>ans;

}while(ans=='y');

return 0;

}