**SSN COLLEGE OF ENGINEERING (Autonomous)**

**Affiliated to Anna University**

**DEPARTMENT OF CSE**

**UCS 1312 Data Structures Lab Laboratory**

**EX2 : Array Implementation of list ADT**

**=====================================================================================REGISTRATION NO: 185001112**

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**CLASS: CSE-B (SEMESTER-3)**

**=====================================================================================Aim:**

To Create a list of 5 student records (using array of structure) with the fields

* Regno
* Name
* Marks in 5 subjects

And perform the following operations

1. Insert a record in the front of the list

2. Insert a record at the end of the list

3. Insert a record after a given Regno in the list

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students’ record

7. Display the previous and next record of a given student

**Note:**

To maintain 3 files.

1. Structure and function definitions – **function.h**

2. Function prototypes – **prototype.h**

3. Application – **main.c**

**Source Code:**

**1) function.h**

#include<stdio.h>

#include<string.h>

#include<stdlib.h>

struct record{

int regno;

char name[10];

int m1,m2,m3,m4,m5;

};

void insertfirst (struct record s[],struct record t,int n)

{

int i=0;

printf("%s",s[i].name);

while(i<n)

{

i+=1;

}

for(int j=i;j>0;j--)

{

s[j]=s[j-1];

}

int j=0;

s[j]=t;

}

void insertlast (struct record s[],struct record t,int n)

{

int j=0;

while(j<n)

{

j+=1;

}

s[j]=t;

}

void insertmid (struct record s[],struct record t,int roll,int n)

{

int i=0;

while(s[i].regno!=roll)

{

i+=1;

}

i++;

for(int j=n;j>i;j--)

{

s[j]=s[j-1];

}

int j=i;

s[j]=t;

}

int searchlist(struct record s[],char ch[],int n)

{

int j=0;

while(j<n)

{

if(strcmp(s[j].name,ch)==0)

break;

j+=1;

}

return j;

}

void delrecord(struct record s[],int a,int n)

{

for(int k=a;k<n-1;k++)

{

s[k]=s[k+1];

}

}

**2) prototype.h**

#include<stdio.h>

#include "function.h"

void insertfirst (struct record s[],struct record t,int n);

void insertlast (struct record s[],struct record t,int n);

void insertmid (struct record s[],struct record t,int roll,int n);

int searchlist(struct record s[],char ch[],int n);

void delrecord(struct record s[],int a,int n);

**3) main.c**

#include<stdio.h>

#include "prototype.h"

int main()

{

struct record s[10];

int n;

printf("\nEnter no of records to be given");

scanf("%d",&n);

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

{

printf("\nEnter %d th roll no.; Name and Marks scored in each 5 subject",i+1);

scanf(" %d %s %d %d %d %d %d",&s[i].regno,s[i].name,&s[i].m1,&s[i].m2,&s[i].m3,&s[i].m4,&s[i].m5);

}

int choice;

struct record temp;

int i;

do

{

printf("\n Enter choice: \n1. Insert new element at the start \n2. Insert new element at the end \n3. Insert new element after the given reg no. \n4. Search a given record in the list based on Name \n5. Delete a given student record \n6. Display all studentsâ€™ record \n7. Display the previous and next record of a given student \n8.Exit");

scanf("%d",&choice);

switch(choice)

{

case 1: printf("\nEnter new record");

scanf("%d",&temp.regno);

scanf(" %s",temp.name);

scanf(" %d",&temp.m1);

scanf(" %d",&temp.m2);

scanf(" %d",&temp.m3);

scanf(" %d",&temp.m4);

scanf(" %d",&temp.m5);

insertfirst(s,temp,n);

printf("\n\nDONE\n");

n+=1;

break;

case 2: printf("\nEnter new record");

scanf("%d",&temp.regno);

scanf("%s",temp.name);

scanf(" %d",&temp.m1);

scanf(" %d",&temp.m2);

scanf(" %d",&temp.m3);

scanf(" %d",&temp.m4);

scanf(" %d",&temp.m5);

insertlast(s,temp,n);

printf("\n\nDONE\n");

n+=1;

break;

case 3: printf("\n Enter the roll no. after which new record must be placed");

int reg;

scanf(" %d",&reg);

printf("\nEnter new record");

scanf(" %d %s %d %d %d %d %d",&temp.regno,temp.name,&temp.m1,&temp.m2,&temp.m3,&temp.m4,&temp.m5);

insertmid(s,temp,reg,n);

printf("\n\nDONE\n");

n+=1;

break;

case 4: printf("\n Enter the name to be searched");

char search[10];

scanf(" %s",search);

i=searchlist(s,search,n);

printf("\nReg no.: %d \nName: %s \nMark1: %d \nMark2: %d \nMark3: %d \nMark4: %d \nMark5: %d",s[i].regno,s[i].name,s[i].m1,s[i].m2,s[i].m3,s[i].m4,s[i].m5);

break;

case 5: printf("\n Enter the name to be deleted");

char delete[10];

scanf(" %s",delete);

int b;

b=searchlist(s,delete,n);

delrecord (s,b,n);

n-=1;

printf("\n\nDONE\n");

break;

case 6: printf("\n");

i=0;

while(i<n)

{

printf("\nReg no.: %d \nName: %s \nMark1: %d \nMark2: %d \nMark3: %d \nMark4: %d \nMark5: %d",s[i].regno,s[i].name,s[i].m1,s[i].m2,s[i].m3,s[i].m4,s[i].m5);

i+=1;

}

break;

case 7: printf("\n Enter the name for whichthe previous and next record of a given student is to be displayed");

int j;

char disp[10];

scanf(" %s",disp);

j=searchlist(s,disp,n);

i=j-1;

if(j!=0)

printf("\n\nPrevious record\n\nReg no.: %d \nName: %s \nMark1: %d \nMark2: %d \nMark3: %d \nMark4: %d \nMark5: %d",s[i].regno,s[i].name,s[i].m1,s[i].m2,s[i].m3,s[i].m4, s[i].m5);

i=j+1;

if(j!=n-1)

printf("\n\nNext record\n\nReg no.: %d \nName: %s \nMark1: %d \nMark2: %d \nMark3: %d \nMark4: %d \nMark5: %d",s[i].regno,s[i].name,s[i].m1,s[i].m2,s[i].m3,s[i].m4,s[i].m5);

break;

case 8: printf("\n\nTHANK YOU!\n");

break;

default: printf("\nINVALID CHOICE TRY AGAIN");

break;

}

}while(choice!=8);

return 0;

}

**Output:**

Enter no of records to be given1

Enter 1 th

roll no.; Name and Marks scored in each 5 subject

2

prathyush

10

10

10

10

10

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students record

7. Display the previous and next record of a given student

8.Exit1

Enter new record1

prakash

9

9

9

9

9

prathyush

DONE

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students record

7. Display the previous and next record of a given student

8.Exit2

Enter new record4

praveen

9

9

9

9

9

DONE

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students record

7. Display the previous and next record of a given student

8.Exit3

Enter the roll no. after which new record must be placed2

Enter new record3

hari

10

10 10 10 10

DONE

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students record

7. Display the previous and next record of a given student

8.Exit4

Enter the name to be searched praveen

Reg no.: 4

Name: praveen

Mark1: 9

Mark2: 9

Mark3: 9

Mark4: 9

Mark5: 9

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all students record

7. Display the previous and next record of a given student

8.Exit5

Enter the name to be deletedhari

DONE

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all studentsâ€™ record

7. Display the previous and next record of a given student

8.Exit6

Reg no.: 1

Name: prakash

Mark1: 9

Mark2: 9

Mark3: 9

Mark4: 9

Mark5: 9

Reg no.: 2

Name: prathyush

Mark1: 10

Mark2: 10

Mark3: 10

Mark4: 10

Mark5: 10

Reg no.: 4

Name: praveen

Mark1: 9

Mark2: 9

Mark3: 9

Mark4: 9

Mark5: 9

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all studentsâ€™ record

7. Display the previous and next record of a given student

8.Exit7

Enter the name for whichthe previous and next record of a given student is to be displayedprathyush

Previous record

Reg no.: 1

Name: prakash

Mark1: 9

Mark2: 9

Mark3: 9

Mark4: 9

Mark5: 9

Next record

Reg no.: 4

Name: praveen

Mark1: 9

Mark2: 9

Mark3: 9

Mark4: 9

Mark5: 9

Enter choice:

1. Insert new element at the start

2. Insert new element at the end

3. Insert new element after the given reg no.

4. Search a given record in the list based on Name

5. Delete a given student record

6. Display all studentsâ€™ record

7. Display the previous and next record of a given student

8.Exit8

THANK YOU!