Expt. No. Date

Page No.

Assignment - 10:

1. Write a C program to implement Stack (info field - integers) using Singly Linked List.

```
#include<stdio.h>
struct node
{
  int info;
  struct node * next;
};
typedef struct node * nodeptr;
nodeptr list=NULL, p;
void main()
{
 int c, x;
 char ch;
do
{
 printf("MENU \n");
 printf("1. PUSH \n2. POP \n3. DISPLAY \n");
 scanf("%d", &c);
 switch(c)
{
 case 1: printf("Enter the no. to be inserted \n");
         scanf("%d", &x);
         push(x);
         break;
 case 2: x=pop();
         printf("Deleted element is %d", x);
         break;
```

Teacher's Signature

Expt. No.

```
        case 3: display();
                break;
    }
    printf("Do you wish to continue \n");
    scanf("%c", &ch);
  }while(ch != 'n');
}

nodeptr getNode()
{
 return (nodeptr) malloc (sizeof (struct node));
}

void push(int x)
{
  p = getNode();
  p->info = x;
  if(list == NULL)
    p->next = NULL;
  else
    p->next = list;
  list = p;
}

void pop()
{
  if(list == NULL)
    printf("Deletion is not possible \n");
```

Teacher's Signature

Expt. No. Date

Page No.

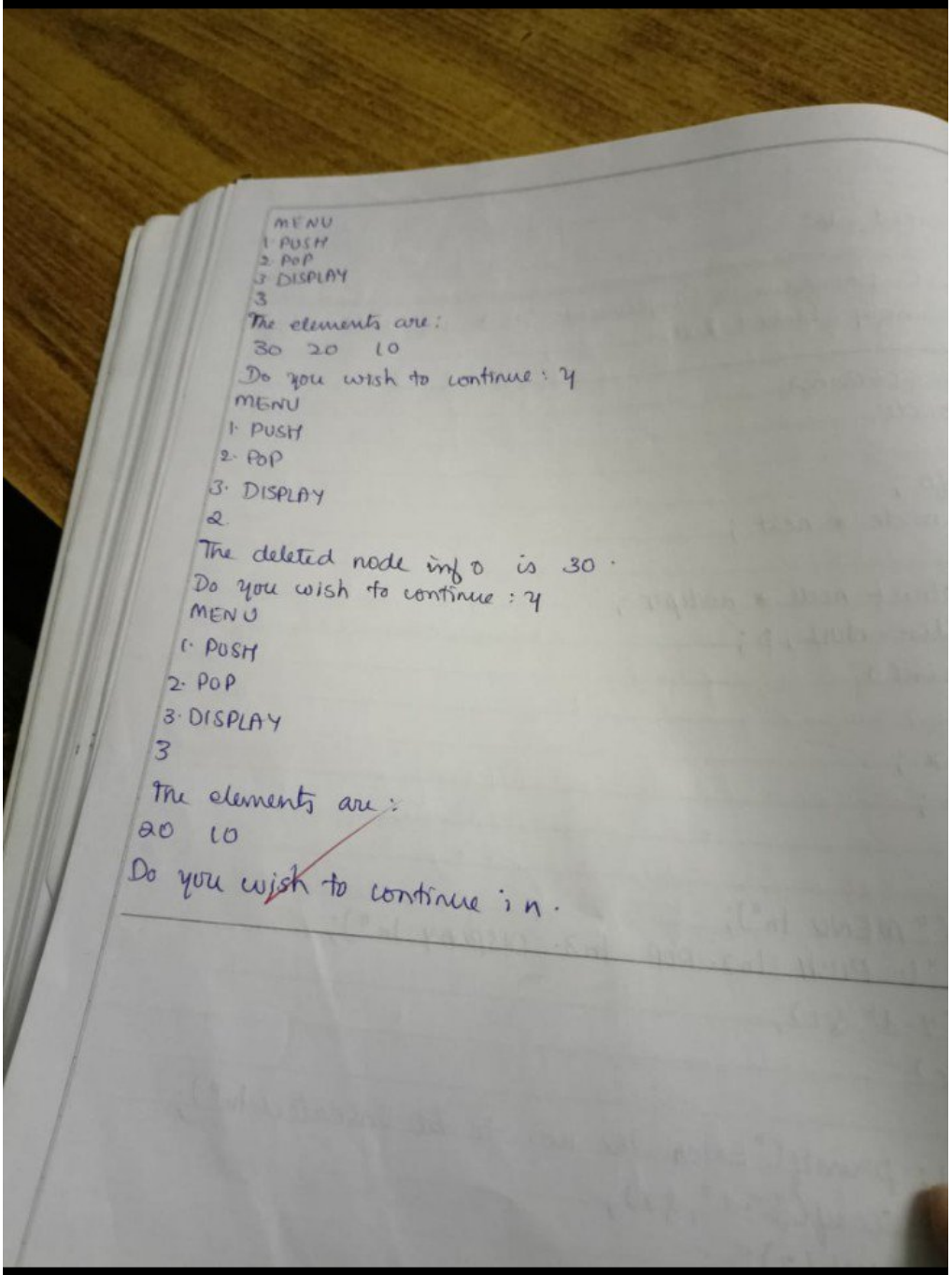
```
    else
    {
     p = list;
     list = p->next;
     p->next = NULL;
     printf("Deleted node info is %d", p->info);
     free(p);
    }
}

void display()
{
  p = list;
  if(list == NULL)
    printf("No nodes present");
  else
  { printf("The elements are:\n");
    while(p != NULL)
    { printf("%d\t", p->info);
      p = p->next;
    }printf("\n");
  }
}
```

Output:

MENU
1. PUSH
2. POP
3. DISPLAY
2.
Deletion is not possible.
Do you wish to continue : y.

MENU
1. PUSH
2. POP
3. DISPLAY
3.
No nodes present
Do you wish to continue : y
MENU
1. PUSH
2. POP
3. DISPLAY
1.
Enter the no. to be inserted.
10.
Do you wish to continue : y
MENU
1. PUSH
2. POP
3. DISPLAY
1.
Enter the no. to be inserted.
20
Do you wish to continue : y
MENU
1. PUSH
2. POP
3. DISPLAY
1.



MENU
1. PUSH
2. POP
3. DISPLAY
3
The elements are:
30 20 10
Do you wish to continue: y
MENU
1. PUSH
2. POP
3. DISPLAY
2
The deleted node info is 30.
Do you wish to continue: y
MENU
1. PUSH
2. POP
3. DISPLAY
3
The elements are:
20 10
Do you wish to continue: n.

Expt No. _____ Date _____

Page No. _____

2 Write a C program to implement Queue (info fields = Empno, Empname, Salary) using Singly Linked list.

```
#include <stdio.h>
struct node
{
 int empno;
 char empname[15];
 int salary;
 struct node *next;
};
typedef struct node * nodeptr;
nodeptr list=NULL, p;
void main()
{
 int c, x;
 char ch;
 do
 {
  printf("MENU\n");
  printf("1. INSERT \n2. DELETE \n3 DISPLAY \n");
  scanf("%d",&c);
  switch(c)
  {
   case 1: insert();
           break;
   case 2: delete();
           break;
   case 3: display();
           break;
```

Teacher's Signature _____

```
 }
```

Expt. No. Date

Page No.

```
    printf(" Do you wish to continue \n");
    scanf(" %c", &ch);
  } while(ch != 'n');
}

nodeptr getNode()
{
  return (nodeptr) malloc (sizeof (struct node));
}

void insert()
{
  nodeptr q;
  p = getNode();
  printf(" Enter the empno \n");
  scanf(" %d", &p->empno);
  printf(" Enter the name \n");
  scanf(" %s", p->empname);
  printf (" Enter the salary \n");
  scanf(" %d", &p->salary);
  p->next = NULL;
  if(list == NULL)
    list = p;
  else
  {
    q = list;
    while (q->next != NULL)
      q = q->next;
    q->next = p;
  }
}
```

Teacher's Signature

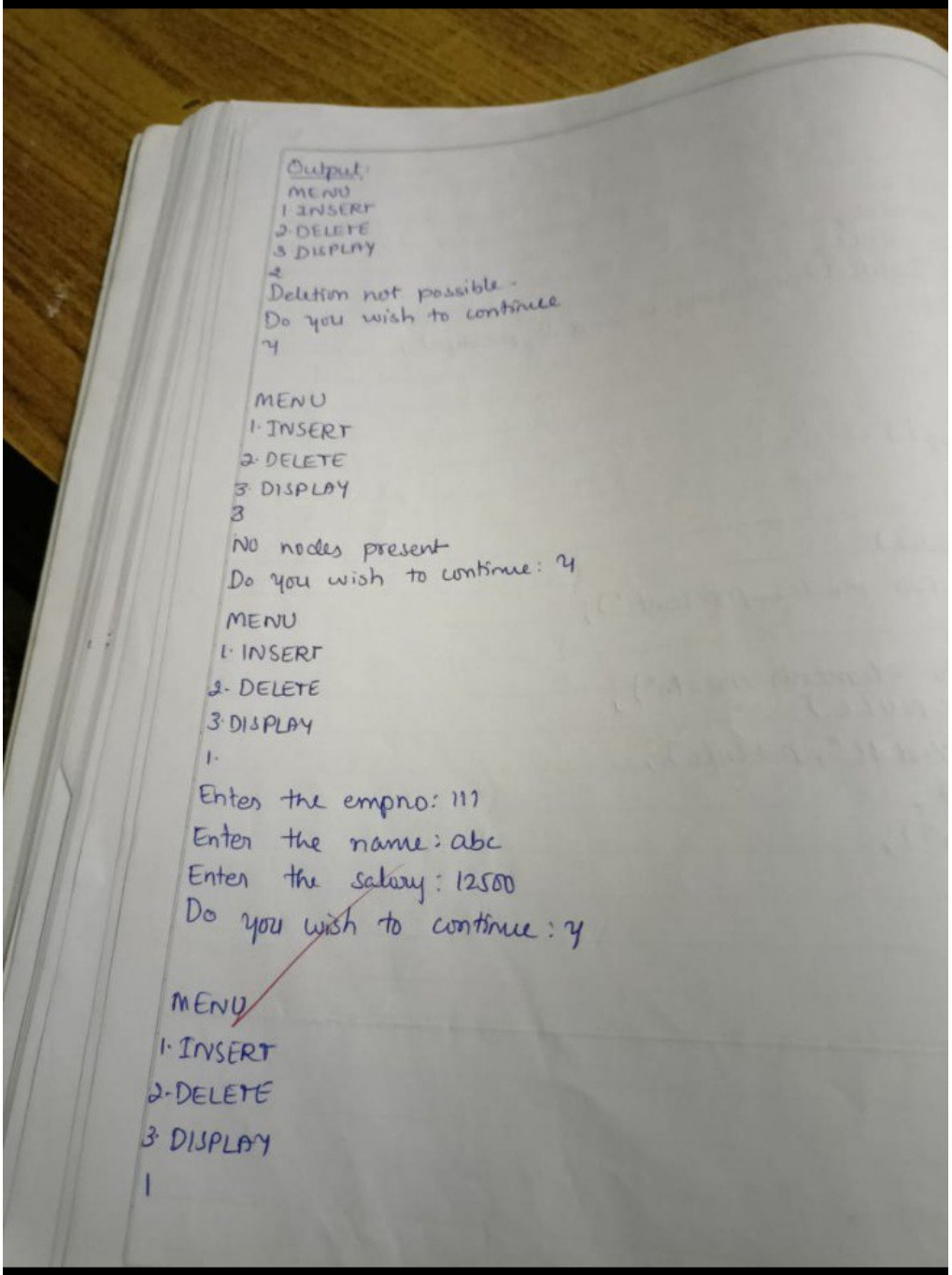
Expt. No. Date

Page No.

```
void delete()
{
  if(list == NULL)
    printf("Deletion not possible \n");
  else
  {
    p = list;
    list = p->next;
    p->next = NULL;
    printf("Deleted node data is : \n");
    printf("Empno : %d", p->empno);
    printf("Name : %s", p->empname);
    printf("Salary : %d", p->salary);
    free(p);
  }
}

void display()
{
  p = list;
  if(list == NULL)
    printf("No nodes present \n");
  else
  {
    while(p != NULL)
    {
      printf("Empno : %d", p->empno);
      printf("Name : %s", p->empname);
      printf("Salary : %d", p->salary);
      p = p->next;
    }
  }
}
```

Teacher's Signature



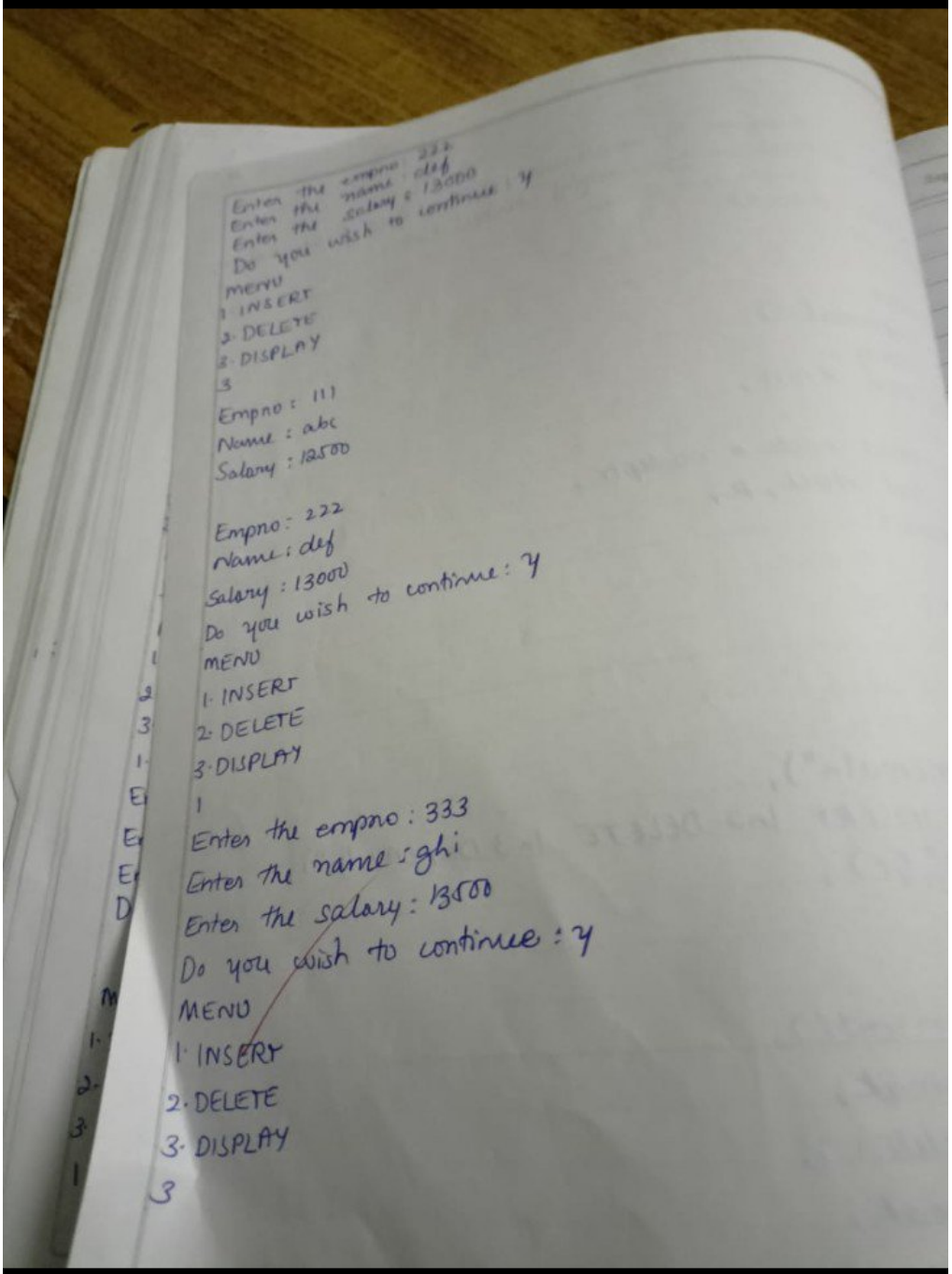
Output:

```
MENU
1. INSERT
2. DELETE
3. DISPLAY
2
Deletion not possible.
Do you wish to continue
y

MENU
1. INSERT
2. DELETE
3. DISPLAY
3
NO nodes present
Do you wish to continue: y

MENU
1. INSERT
2. DELETE
3. DISPLAY
1.
Enter the empno: 111
Enter the name: abc
Enter the salary: 12500
Do you wish to continue: y

MENU
1. INSERT
2. DELETE
3. DISPLAY
1
```



Enter the empno 222
Enter the name: def
Enter the salary: 13000
Do you wish to continue: y
MENU
1. INSERT
2. DELETE
3. DISPLAY
3
Empno: 111
Name: abc
Salary: 12500

Empno: 222
Name: def
Salary: 13000
Do you wish to continue: y
MENU
1. INSERT
2. DELETE
3. DISPLAY
1
Enter the empno: 333
Enter the name: ghi
Enter the salary: 13500
Do you wish to continue: y
MENU
1. INSERT
2. DELETE
3. DISPLAY
3

Expt. No. _____ Date _____ 14

Page No. _____

5. Write a C program to implement stack using Circular Singly Linked List.

```
#include<stdio.h>
struct node
{
 int info;
 struct node *next;
};
typedef struct node *nodeptr;
nodeptr list=NULL, p;
void main()
{
 int c, x;
 do
 {
  printf("MENU \n");
  printf("1. PUSH \n2. POP \n3. DISPLAY \n4. EXIT \n");
  scanf("%d", &c);
  switch(c)
  {
   case 1: printf("Enter the no. to be inserted : \n");
           scanf("%d", &x);
           push(x);
           break;
   case 2: pop();
           break;
   case 3: display();
           break;
   case 4: exit(0);
```

Teacher's Signature _____

Expt. No.

Date

Page No. 15

```
    default: printf("Invalid Choice !!!\n");
             break;
    }
  }while(c>=0);
}

nodeptr getNode()
{
  return (nodeptr) malloc (sizeof(struct node));
}

void push(int x)
{
  p=getNode();
  p->info=x;
  if(list==NULL)
    list=p;
  else
    p->next=list->next;
  list->next=p;
}

void pop()
{
  if(list==NULL)
    printf("Deletion Not Possible\n");
  else
  {
    p=list->next;
```

Teacher's Signature

Expt. No.

Date

Page No. 16

```
    if(list == p)
      list = NULL;
    else
    {
      list->next = p->next;
      p->next = NULL;
    }
    printf("Deleted Node info is %d", p->info);
    free(p);
  }
}

void display()
{
  if(list == NULL)
    printf("No nodes present \n");
  else
  {
    p = list->next;
    printf("The elements are : \n");
    do
    {
      printf("%d\t", p->info);
      p = p->next;
    } while (p != (list->next));
    printf("\n");
  }
}
```

Output:

```
MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT.
2
Deletion Not Possible.

MENU
1. PUSH
2. POP
3. DISPLAY
4 EXIT
3
NO Nodes Present

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT.
1
Enter the no. to be inserted: 10.

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT
1
Enter the no. to be inserted: 20
```

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT

3
The elements are.
20 10

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT

1
Enter the no. to be inserted: 30

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT

3
The elements are.
30 20 10

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT

2.
Deleted Node info is: 30

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT
3
The elements are:
20 10

MENU
1. PUSH
2. POP
3. DISPLAY
4. EXIT
4.