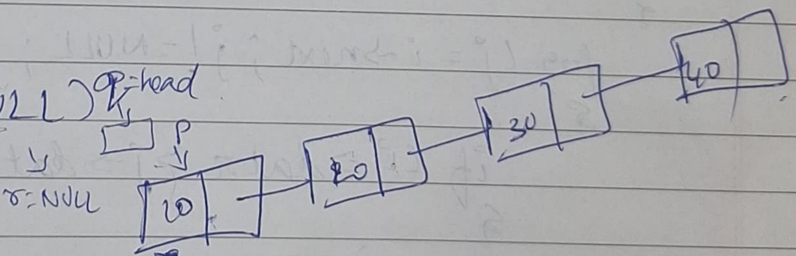
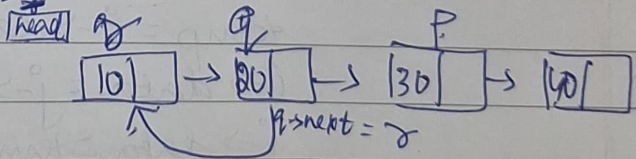
25/1/24 LAB - 6

1.
```
#include <stdio.h>
#include <stdlib.h>
struct node
{
    int data;
    struct node *next;
}*first=NULL, *second=NULL;
void display(struct node* s)
{
    while(s!=NULL)
    {
        printf("%d\t", s->data);
        s=s->next;
    }
}

void create1(int a[], int n)
{
    struct node *last, *t;
    first=(struct node *) malloc (sizeof (struct node));
    first->data=a[0];
    first->next=NULL;
    last=first;
    for(int i=1; i<n; i++)
    {
        t=(struct node *) malloc (sizeof(struct node));
        t->data=a[i];
        t->next=NULL;
        Last->next=t;
        last=t;
    }
}
```

[illegible] 25/1/24

```
void create2(int a[], int n)
{
    struct node *last, *t;
    second=(struct node *) malloc(sizeof(struct node));
    second->data=a[0];
    second->next=NULL;
    last=second;
    for(int i=1; i<n; i++)
    {
        t=(struct node *) malloc(sizeof(struct node));
        t->data=a[i];
        t->next=NULL;
        last->next=t;
        last=t;
    }
}


void reverse(struct node *p)
{
    struct node *q, *r;
    p=first;
    q=NULL;
    r=NULL;
    while(p!=NULL)
    {
        r=q;
        q=p;
        p=p->next;
        q->next=r;
    }
    first=q;
}
```





```
struct node* concatat (struct node *p, struct node *q)
{
    struct node *r;
    if (p==NULL)
    {
        p=q;
        return p;
    }
    if (q==NULL)
        return q;
    r=p;
    while (r->next!=NULL)
            r=r->next;
    r->next=q;
    return p;
}
void sort (struct node *p)
{
    struct node *i, *j;
    int temp;
    for (i=p; i->next!=NULL; i=i->next)
    {
        for (j=i->next; j!=NULL; j=j->next)
        {
            if (i->data > j->data)
            {
                temp=i->data;
                i->data=j->data;
                j->data=temp;
            }
        }
    }
}
```

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```
void main()
{
    int a[10], b[10], n1, n2;
    printf("enter n:");
    scanf("%d", &n1);
    printf("enter the values");
    for(int i=0; i<n1; i++)
    {
        scanf("%d", &a[i]);
    }
    struct node *s;
    s=(struct node *) malloc (sizeof (struct node));
    create1(a, n1);
    sort(first);
    printf("sorted list");
    display(first);
    reverse(first);
    printf("\n reversed list");
    display(first);
    printf("\nenter n:");
    scanf("%d", &n2);
    printf("enter the values");
    for(int i=0; i<n2; i++)
    {
        scanf("%d", &b[i]);
    }
    create2(b, n2);
    display(second);
    s=concatat(first, second);
    display(s);
}
```

O/P
```
enter n:5
enter the values 9   5  7 3  1
Sorted list 1 3  5  7 9
reversed list 9 7 5 3 1
enter n: 4
enter the values   3  2 6 5
3   2    6   5
concateted.
9   7   5   3  1 3 2 6 5
```

2.
```
//Stack
#include <stdio.h>
#include <stdlib.h>

struct node
{
        int data;
        struct node *next;
}*top=NULL;
int empty(){
      if(top==NULL)
              return 1;
      return 0;
 }
int full()
{
        struct node *t
        t=(struct node *) malloc(sizeof(struct node));
        if (t=NULL)
                return 1;
       return 0;
}
```

```
void push (int x)
{
    struct node *t;
     t=(struct node *) malloc (sizeof (struct node));
     if (full ()) {
          printf ("overflow");
     }
     else {
        t->data = x;
        t->next =top;
        top=t;
     }
}
 int pop() {
       struct node *t;
       t = top;
       while (t != NULL) {
          printf ("%d \t", t->data);
          t = t->next;
       }
       printf ("\n");
 }

 void main()
 {
       int c, no, x;
       while (1)
       {
          printf ("enter 1 for insert 2 for delete 3 for display
                 4 for exit \n");
          printf (" enter the choice:");
          scanf ("%d", &c);
switch(c)
{
  case 1: printf("enter the no:");
        scanf("%d", &no);
        push(no);
        break;
  case 2: x = pop();
          if (x != -1){
             printf("%d is popped\n", x);
          }
        break;
  case 3: display();
          break;
  case 4 : exit(0);
  default : printf("invalid\n");
            break;
  }
 }
}.
```

[illegible]

O/P
```
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
Enter the no: 10
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice:1
enter the no:20
Enter 1 for insert 2 for delete 3 for display 4 for exit
Enter the choice:1
enter the no.30
Enter 1 for insert 2 for delete 3 for display 4 for exit
Enter the cohice; 3
30   20   10
```

```
enter 1for insert 2 for delete 3for display 4 for exit
enter the choice:2
30 is popped
enter 1for insert 2 for delete 3for display 4 for exit
enter the choice:4.
```

3 //queue.

```
#include <stdio.h>
#include <stdlib.h>

struct node
{
    int data;
    struct node *next;
}*front = NULL, *rear = NULL;
void enqueue(int x)
{
    struct node *t;
    t = (struct node*) malloc (sizeof(struct node));
    if (t= =NULL)
    {
        printf("overflow");
    }
    t->data=x;
    t->next=NULL;
    if (front = = NULL)
    {
        front = rear = t;
    }
    else{
        rear->next=t;
        rear=t;
    }
```

```
int dequeue()
{
    int x=-1;
    struct node *t;
    if (front==NULL)
    {
        printf("underflow");
        return x;
    }
    else {
        x=front->data;
        t=front;
        front=front->next;
        free(t);
        return x;
    }
}
void display()
{
    struct node *t;
    t= front;
    while (t!=NULL){
        printf("%d\t", t->data);
        t=t->next;
    }
    printf("\n");
}
void main()
{
    int c, no, x;
    while(1)
    {.
```
front==NULL

```
printf("enter 1 for insert 2 for delete 3 for display
  4 for exit \n");
printf("enter the choice:");
scanf("%d", &c);
switch(c)
{
   case 1: printf("enter the no:");
           scanf("%d", &no);
           enqueue(no);
           break;
   case 2: x = dequeue();
           if (x != -1){
               printf("%d is popped\n", x);
           }
           break;
   case 3: display();
           break;
   case 4: exit(0);
   default: printf("invalid \n");
           break;
}
   }
}
```

O/P

```
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice: 1
enter the no: 10
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice: 1
enter the no: 20
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice: 1
enter the no: 30
enter 1 for insert 2 for delete 3 for display 4 for e
enter the choice ;3
10     20     30
enter 1 for insert 2 for delete 3 for display 4 for ex
enter the choice:2
10 is popped
enter 1 for insert 2 for delete 3 for display 4 for exit
enter the choice; 4
```