

LAB 6 : PRIORITY QUEUE IMPLEMENTATION

WAP to simulate the working of a circular queue of integers using an array. Provide the following operations

a) Insert

b) Delete

c) Display

The program should print appropriate messages for queue empty and queue overflow conditions

```
#include <stdio.h>
#include <stdlib.h>
#define q_size 5
int r=-1,f=0,item,count=0;
int q[10],ch;
void insert_rear(){
    if (r==q_size-1){
        printf("Queue overflow\n");
        return;
    }
    r=r+1;
    q[r]=item;
    count++;
}
void insertion_sort(){
    int i,j,key;
    for (i=1;i<count;i++)
    {
        key=q[i];
        j=i-1;
        while (j>=0 && q[j]>key){
            q[j+1]=q[j];
            j=j-1;
        }
        q[j+1]=key;
    }
}
void delete_front(){
    if (f>r){
        f=0;
        r=-1;
        printf("Queue is empty\n");
        return;
    }
    printf("Item deleted=%d\n",q[f++]);
```

```

}
void display(){
    if (f>r){
        printf("Queue is empty\n");
        return;
    }
    printf("Contents of the queue are:\n");
    for(int i=f;i<=r;i++)
    {
        printf("%d\n",q[i]);
    }
}
int main(){
    for (;;)
    {
        printf("\n1:insert_rear\n2:delete_front\n3:display\n");
        printf("Enter the choice:\n");
        scanf("%d",&ch);
        switch (ch){
            case 1:printf("Enter the item:\n");
                scanf("%d",&item);
                insert_rear();
                insertion_sort();
                break;
            case 2:delete_front();
                break;
            case 3:display();
                break;
            default:exit(0);
        }
    }
    return 0;
}

```

Output

```
1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
10

1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
17

1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
16

1:insert_rear
2:delete_front
```

```
1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
8

1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
12

1:insert_rear
2:delete_front
3:display
Enter the choice:
3
Contents of the queue are:
8
10
12
16
17
```

```
1:insert_rear
2:delete_front
3:display
Enter the choice:
1
Enter the item:
11
Queue overflow

1:insert_rear
2:delete_front
3:display
Enter the choice:
2
Item deleted=8

1:insert_rear
2:delete_front
3:display
Enter the choice:
2
Item deleted=10

1:insert_rear
2:delete_front
3:display
Enter the choice:
```

```
1:insert_rear
2:delete_front
3:display
Enter the choice:
2
Item deleted=16

1:insert_rear
2:delete_front
3:display
Enter the choice:
2
Item deleted=17

1:insert_rear
2:delete_front
3:display
Enter the choice:
2
Queue is empty
```

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