WAP to stimulate the working of a queue of integers using an array. Provide the following operations: insert, delete, display. the program should print appropriate message for queue.

Algorithm:

1. set front to -1, rear to -1, define array queue[MAX]
2. insert, if rear == max - 1
   print Queue overflow
   Exit
   if front == -1
   set front = 0
3. set rear = rear + 1
4. item = queue[rear]
   display item inserted
5. if front == -1 or rear == -1
   print queue underflow
   Exit
6. item = queue[front]
   display item deleted
   front = front + 1
   if front > rear
   set front = -1
   set rear = -1
7. if front == -1
   print Queue empty
   exit
   for i from front to rear
   queue[i]

8. Repeat main loop until user exits
9. Print menu insert, delete, display
10. run switch for all cases and call function respectively

CODE:

```
#include <stdio.h>
#include <stdlib.h>
# define n 5
int queue[n];
int front = -1, rear = -1 ;


void enqueue (int x)
{
   if (rear == n-1)
         printf("Queue overflow.\n");
   else if (front == -1 && rear == -1)
   {
      front = rear = 0;
      queue[rear] = x;
      printf("Element inserted\n");
   }
  else
  {
     rear++;
     queue[rear] = x;
     printf("Element inserted\n");
  }
}
```

```
void dequeue()
{
    if (front == -1 && rear == -1)
        printf ("Queue underflow.\n");
    else if (front == rear)
        front = rear = -1;
    else
    {
        printf ("Element deleted : %d.\n", queue[front]);
        front++;
    }
}

void display()
{
    for(int i = front; i <= rear; i++)
    {
        printf("%d \n", queue[i]);
    }
}

int main()
{
    int ch, x;
    printf("1. Insert\n 2. Delete\n 3. Display\n 4. Exit\n");
    while (1) {
        printf("Enter choice: \n");
        scanf ("%d", &ch);
        switch(ch)
        {
            case 1:
```

```
            printf(" Enter a number: ");
            scanf ("%d", &x);
            enqueue (x);
            break;
        case 2:
            dequeue();
            break;
        case 3:
            display();
            break;
        case 4:
            return 0;
        default:
            printf("invalid choice:");
    }
}
    return 0;
}
```

output:

```
1. Insert
2. Delete
3. Display
4. Exit
Enter choice:
2
Queue Underflow.
Enter choice:
1
Enter a number: 23
Element inserted
Enter choice:
1
```

Date:

Enter a number: 56	56
Element inserted	89
Enter choice:	74
1	12
Enter a number: 89	Enter a choice:
Element inserted	4

Enter choice:

1

Enter a number: 74

Element inserted

Enter a choice:

1

Enter a number: 12

Element inserted

Enter a choice:

1

Enter a number: 58

Queue Overflow.

Enter a choice:

3

23

56

89

74

12

Enter a choice:

2

Element deleted: 23

Enter a choice:

3

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