Aim:

Write a program to implement queue using **arrays**.

```
Sample Input and Output:
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 1
        Enter element : 23
        Successfully inserted.
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 1
        Enter element : 56
        Successfully inserted.
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 3
        Elements in the queue : 23 56
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 4
        Queue is not empty.
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 5
        Queue size : 2
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 2
        Deleted element = 23
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 2
        Deleted element = 56
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 4
        Queue is empty.
        1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit
        Enter your option : 6
```

Source Code:

QUsingArray.c

```
#include <conio.h>
#include <stdio.h>
#define MAX 10
int queue[MAX];
int front = -1, rear = -1;
void enqueue(int x)
{
   if (rear == MAX - 1)
   {
      printf("Queue is overflow.\n");
   }
   else
   {
      rear++;
```

```
      queue[rear] = x;
      printf("Successfully inserted.\n");
   }
   if (front == -1)
   {
      front++;
   }
}
void dequeue()
{
   if (front == -1)
   {
      printf("Queue is underflow.\n");
   }
   else
   {
      printf("Deleted element = %d\n",queue[front]);
      if (rear == front)
      {
         rear = front = -1;
      }
      else
      {
         front++;
      }
   }
}
void display()
{
   if (front == -1 && rear == -1)
   {
      printf("Queue is empty.\n");
   }
   else
   {
      printf("Elements in the queue : ");
      for (int i = front; i <= rear; i++)
      {
         printf("%d ",queue[i]);
      }
      printf("\n");
   }
}
void size()
{
   if(front == -1 && rear == -1)
   printf("Queue size : 0\n");
   else
   printf("Queue size : %d\n",rear-front+1);
}
void isEmpty()
{
   if(front == -1 && rear == -1)
   printf("Queue is empty.\n");
   else
   printf("Queue is not empty.\n");
```


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```
}
int main()
{
   int op, x;
   while(1)
   {
      printf("1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit\n");
      printf("Enter your option : ");
      scanf("%d",&op);
      switch(op)
      {
         case 1:
         printf("Enter element : ");
         scanf("%d",&x);
         enqueue(x);
         break;
         case 2:
         dequeue();
         break;
         case 3:
         display();
         break;
         case 4:
         isEmpty();
         break;
         case 5:
         size();
         break;
         case 6: exit(0);
      }
   }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 2
Enter your option : 2
Queue is underflow. 3
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 3
Enter your option : 3
Queue is empty. 4
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 4
Enter your option : 4
Queue is empty. 5
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 5
Enter your option : 5
Queue size : 0 1
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 14

Successfully inserted. 1
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 78
Successfully inserted. 1
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 53
Successfully inserted. 3
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 3
Enter your option : 3
Elements in the queue : 14 78 53 5
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 5
Enter your option : 5
Queue size : 3 6
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 6
Enter your option : 6

Test Case - 2
User Output
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 25
Successfully inserted. 2
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 2
Enter your option : 2
Deleted element = 25 2
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 2
Enter your option : 2
Queue is underflow. 3
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 3
Enter your option : 3
Queue is empty. 1
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 65
Successfully inserted. 3
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 3
Enter your option : 3
Elements in the queue : 65 4
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 4
Enter your option : 4
Queue is not empty. 2
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 2
Enter your option : 2
Deleted element = 65 4
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 4
Enter your option : 4
Queue is empty. 5
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 5
Enter your option : 5

Queue size : 0 1
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 1
Enter your option : 1
Enter element : 63
Successfully inserted. 5
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 5
Enter your option : 5
Queue size : 1 6
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 6
Enter your option : 6