S.No: 16

Aim:

Write a program to implement queue using arrays.

Array representation

```
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
```

Exp. Name: Write a C program to implement different Operations on Queue using

Source Code:

OueueUsingArrav.c

```
#include <conio.h>
#include <stdio.h>
#include "QueueOperations.c"
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);
      }
   }
}
```

QueueOperations.c

```
#include<stdio.h>
#include<stdlib.h>
#define MAX 100
int queue[MAX];
unsigned int Size=0;rear=MAX-1,front=0;
int enqueue(int x)
   if(Size==MAX)
      printf("Queue is overflow.\n");
   }
   rear=(rear+1)%MAX;
   Size++;
   queue[rear]=x;
   printf("Successfully inserted.\n");
   return 1;
}
int dequeue()
{
   int x;
   if(Size==0)
      printf("Queue is underflow.\n");
   }
   else
      x=queue[front];
      front=(front+1)%MAX;
      if(Size!=0)
         printf("Deleted element = %d\n",x);
         Size--;
      }
   return x;
```

```
int display()
   int i;
   if(Size==0)
      printf("Queue is empty.\n");
   }
   else
   {
      printf("Elements in the queue : ");
      for(i=front;i<=rear;i++)</pre>
         printf("%d ",queue[i]);
      }
      printf("\n");
   }
}
int* size()
   printf("Queue size : %d\n",Size);
}
int isEmpty()
   if(Size==0)
      printf("Queue is empty.\n");
   }
   else
   {
      printf("Queue is not empty.\n");
   }
}
```

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 : 01
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 : 36 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 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 4 Enter your option: 2 Deleted element = 65 4 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: 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	1000 0000 2
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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 3
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	1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 5

Enter your option : 5
Queue size : 01
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 : 16
1.Enqueue 2.Dequeue 3.Display 4.Is Empty 5.Size 6.Exit 6
Enter your option : 6