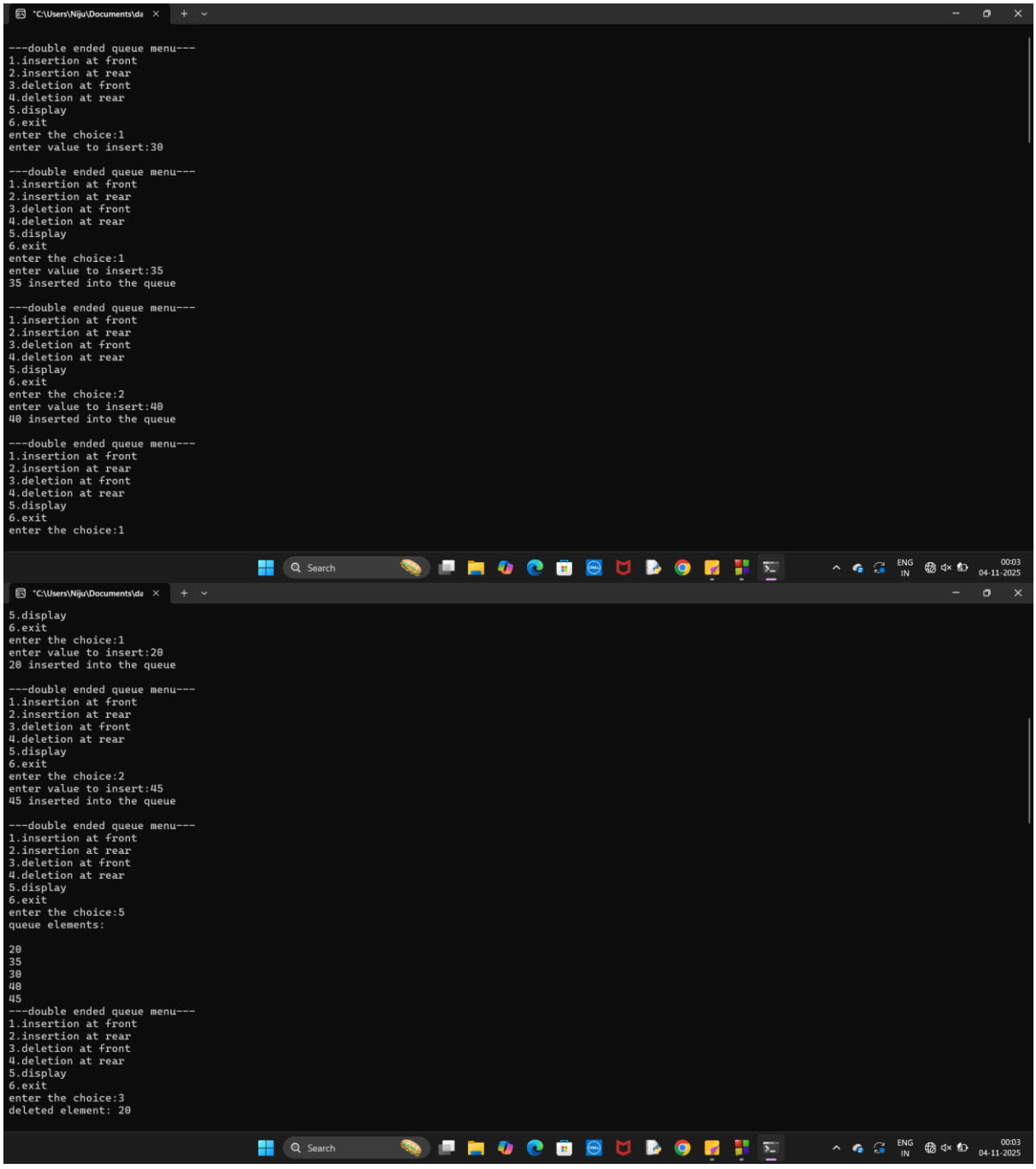
Write a program to stimulate the working of double ended queue of integers using an array. Provide the following operations: insert, delete, display.
The program should print appropriate for queue empty and queue overflow conditions.

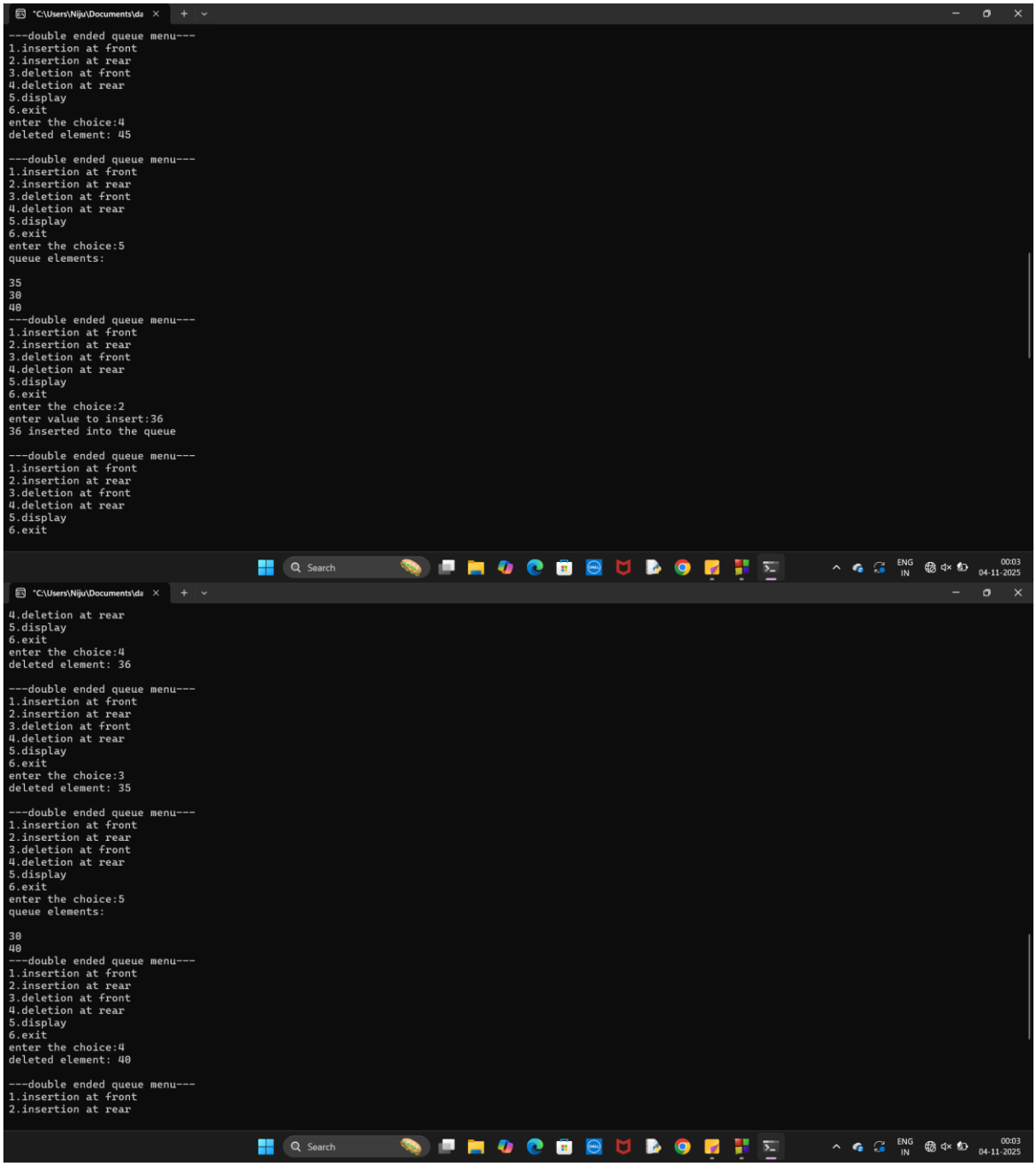
```
//operations over double-ended queue
#include<stdio.h>
#include<stdlib.h>
#define max 5
int queue[max];
int front=-1,rear=-1;

void insertatrear(int item)
{
  if(rear==max-1)
  {
    printf("queue overflow.cannot insert %d\n",item);
  }
  else if(front==-1)
    {
      front=0;
      rear=0;
      queue[rear]=item;
    }
  else
    {
      rear=rear+1;
      queue[rear]=item;
      printf("%d inserted into the queue\n",queue[rear]);
    }
}
void insertatfront(int item)
{
  if(rear==max-1)
  {
    printf("queue overflow.cannot insert %d\n",item);
  }
  else if(front==-1)
    {
      front=0;
      rear=0;
      queue[rear]=item;
    }
  else
    {
      int j=rear;
      while(j>=front)
      {
        queue[j+1]=queue[j];
        j--;
```

```
        }
       queue[front]=item;
       rear=rear+1;
       printf("%d inserted into the queue\n",queue[front]);
      }
}
void deleteatfront()
{
  if(front==-1)
  {
    printf("queue underflow. queue is empty\n");
  }
  else
  {
    printf("deleted element: %d\n",queue[front]);
    if(front==rear)
    {
      front=-1;
      rear=-1;
    }
    else
    {
      front=front+1;
    }
  }
}

void deleteatrear()
{
  if(front==-1)
  {
    printf("queue underflow. queue is empty\n");
  }
  else
  {
    printf("deleted element: %d\n",queue[rear]);
    if(front==rear)
    {
      front=-1;
      rear=-1;
    }
    else
    {
      rear=rear-1;
    }
  }
}
```

```
void display()
{
   if(front==-1)
   {
      printf("queue is empty\n");
   }
   else
   {
      printf("queue elements:\n");
      for(int i=front;i<=rear;i++)
      {
         printf("\n%d ",queue[i]);
      }
   }
}
int main()
{
   int choice,value;
   while(1)
   {
      printf("\n---double ended queue menu---");
      printf("\n1.insertion at front \n2.insertion at rear\n3.deletion at front \n4.deletion at
rear  \n5.display \n6.exit \n");
      printf("enter the choice:");
      scanf("%d",&choice);
      switch(choice)
      {
         case 1:
            printf("enter value to insert:");
            scanf("%d",&value);
            insertatfront(value);
            break;
         case 2:
            printf("enter value to insert:");
            scanf("%d",&value);
            insertatrear(value);
            break;
         case 3:
            deleteatfront();
            break;
         case 4:
            deleteatrear();
            break;
         case 5:
            display();
            break;
         case 6:
```

```
            printf("exiting program");
            exit(0);
        default:
            printf("invalid choice. please tyr again\n");
      }
   }
   return 0;
}
```




"C:\Users\Niju\Documents\da
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:4
deleted element: 45
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:5
queue elements:
35
30
40
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:2
enter value to insert:36
36 inserted into the queue
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
Search
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"C:\Users\Niju\Documents\da
4.deletion at rear
5.display
6.exit
enter the choice:4
deleted element: 36
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:3
deleted element: 35
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:5
queue elements:
30
40
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:4
deleted element: 40
---double ended queue menu---
1.insertion at front
2.insertion at rear
Search
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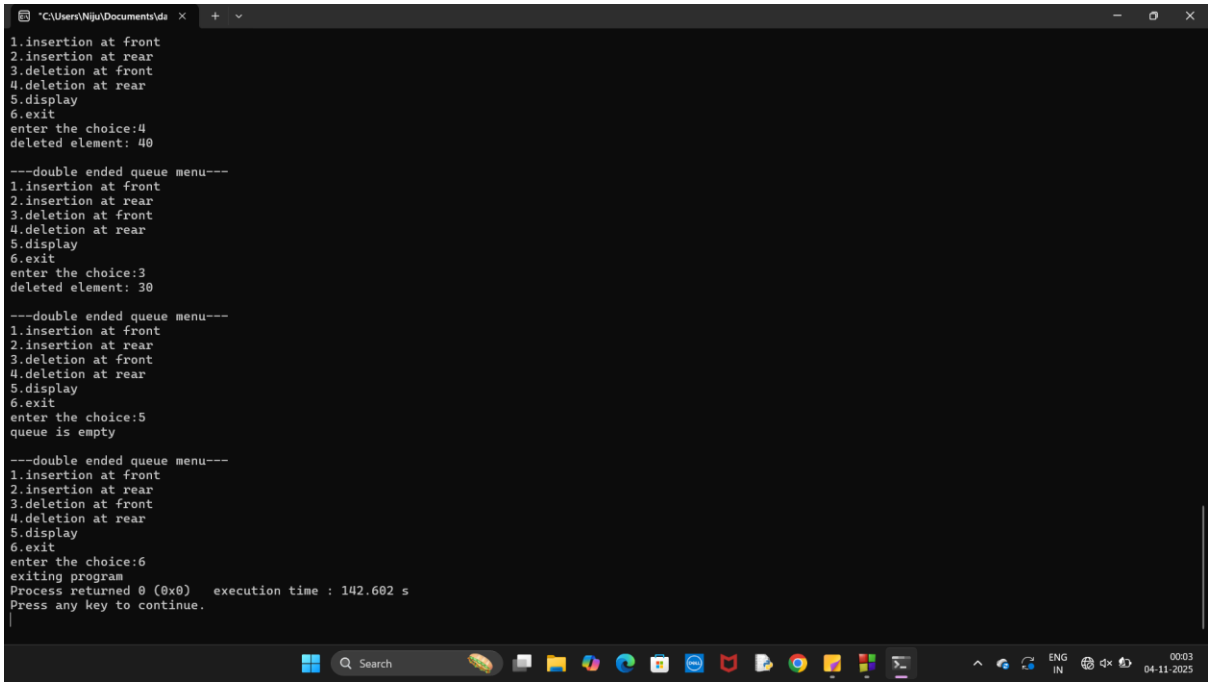
"C:\Users\Niju\Documents\da
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:4
deleted element: 40
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:3
deleted element: 30
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:5
queue is empty
---double ended queue menu---
1.insertion at front
2.insertion at rear
3.deletion at front
4.deletion at rear
5.display
6.exit
enter the choice:6
exiting program
Process returned 0 (0x0) execution time : 142.602 s
Press any key to continue.
Search
ENG
IN
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