Ex. No. 4	ARRAY IMPLEMENTATION OF QUEUE
24-07-2017	

Question:

To simulate the working of a queue of integers using an array with the following operations: (a) Insert (b) Delete (c) Display(d) queue full (e)queue empty

Algorithm:

1. Start.
2. Initialize max =5, front=rear=-1.
3. Create an array of size max.
4. Create a function to insert an element to queue as:

```
if(rear==Max-1)
 cout<<"\n Queue is full"<<endl;
 else{cout<<"\n\n Enter the element for insertion: ";
 cin>>item;
  rear=rear+1;
  q[rear]=item;
  cout<<"\n Inserted element is: "<<q[rear]<<endl;}
 if(Front==-1) {Front=0; }
```

5. Create a function to delete elements from queue as:

```
if(Front==-1){
 cout<<"\n Queue is empty"<<endl;}
 else{ item=q[Front];
 cout<<"\n Deleted item: "<<q[Front]<<endl;
 if(Front==rear)
```

```
        Front=rear=-1;
    else
        Front=Front+1;
```

6. Then using for loop, display the elements of queue.
7. In main function, use switch case and perform the operations according to user's choice and call the functions to perform the respective operations.
8. End.

Program:

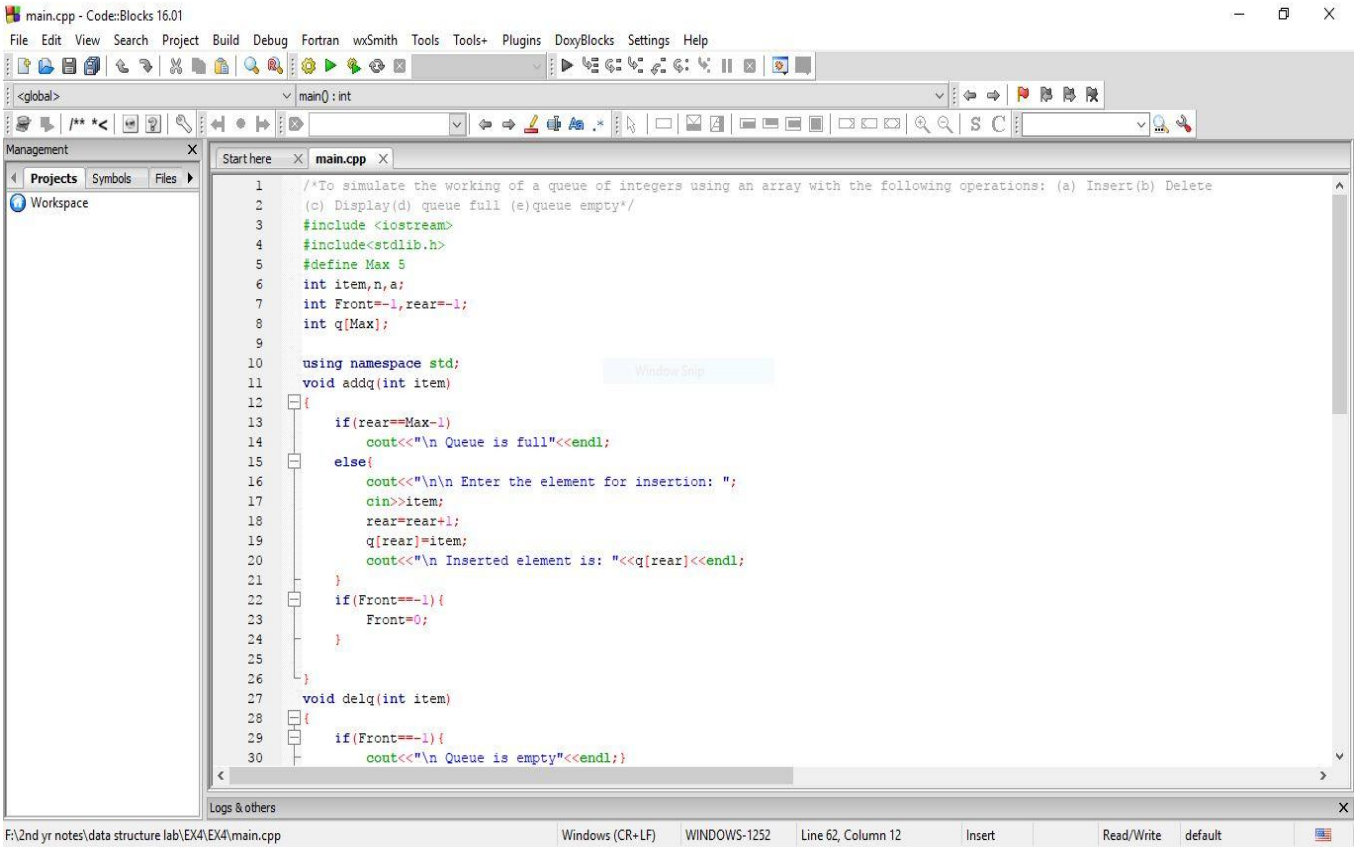
```
/*To simulate the working of a queue of integers using an array with the following operations: (a) Insert(b) Delete (c) Display(d) queue full (e)queue empty*/

#include <iostream>

#include<stdlib.h>

#define Max 5

using namespace std;

int item, n, a;

int Front=-1, rear=-1;

int q[Max];


void addq(int item)

{

  if(rear==Max-1)

     cout<<"\n Queue is full"<<endl;

  else{
```

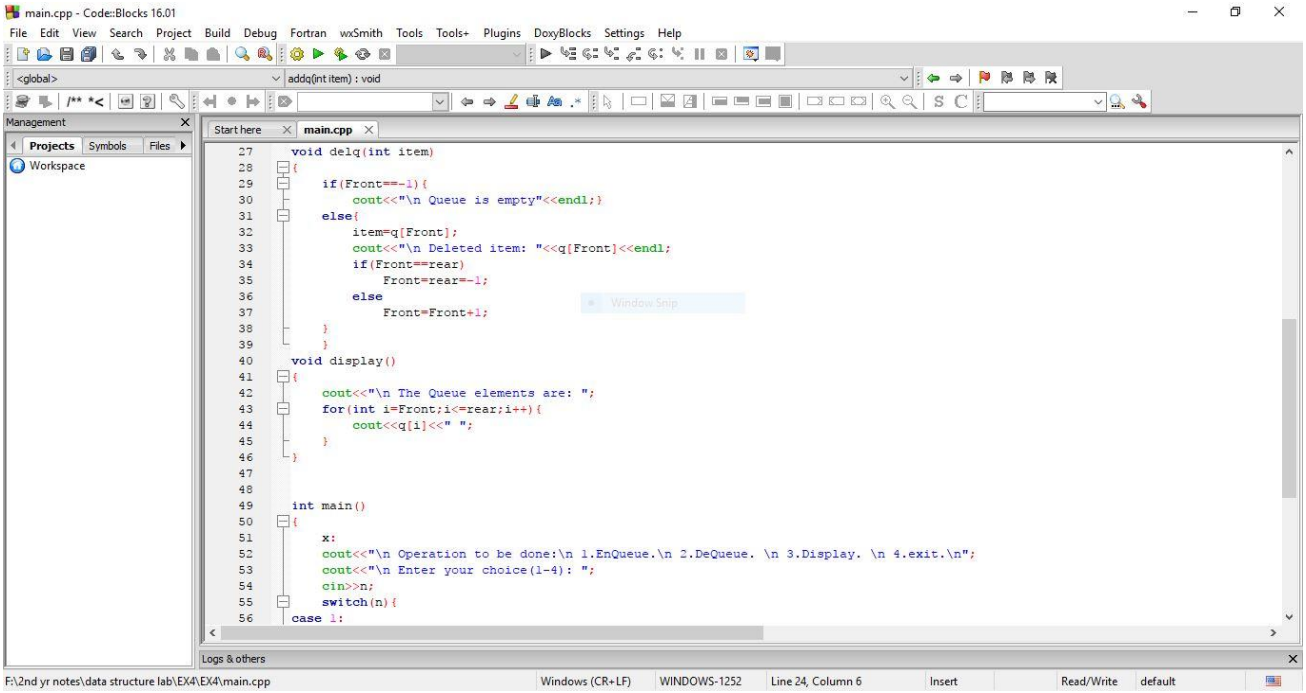
```
        cout<<"\n\n Enter the element for insertion: ";
        cin>>item;
        rear=rear+1;
        q[rear]=item;
        cout<<"\n Inserted element is: "<<q[rear]<<endl;
    }
    if(Front==-1){
        Front=0;
    }}
void delq(int item)
{
    if(Front==-1){
        cout<<"\n Queue is empty"<<endl;}
    else{
        item=q[Front];
        cout<<"\n Deleted item: "<<q[Front]<<endl;
        if(Front==rear)
            Front=rear=-1;
        else
            Front=Front+1;
    }}
void display()
```

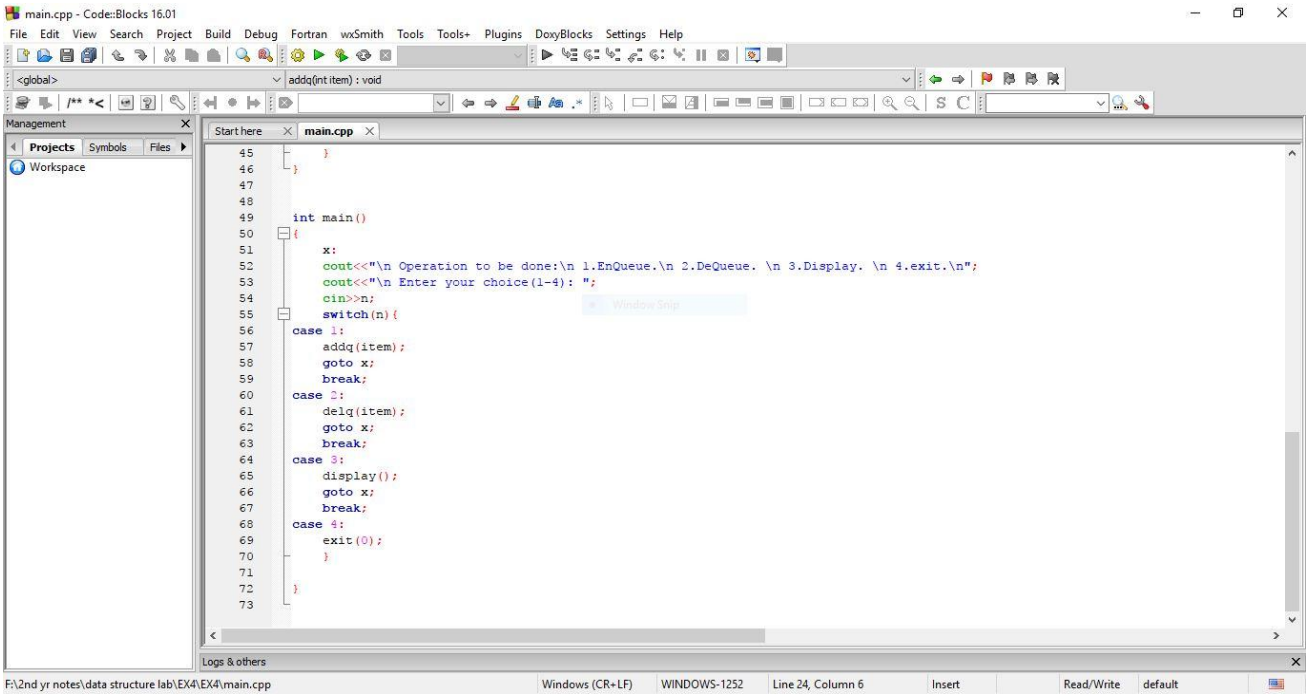
```
{
   cout<<"\n The Queue elements are: ";
   for(int i=Front;i<=rear;i++){
      cout<<q[i]<<" ";
   }}
int main()
{
   x:
 cout<<"\n Operation to be done:\n 1.EnQueue.\n 2.DeQueue. \n 3.Display. \n 4.exit.\n";
   cout<<"\n Enter your choice(1-4): ";
   cin>>n;
   switch(n){
case 1:
   addq(item);
   goto x;
   break;
case 2:
   delq(item);
   goto x;
   break;

case 3:
```

```
    display();
    goto x;
    break;
case 4:
    exit(0);
    }}
```

Output:




main.cpp - Code::Blocks 16.01
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
addq(int item) : void
Management
Projects Symbols Files
Workspace
Start here
main.cpp
27 void delq(int item)
28 {
29 if(Front==-1){
30 cout<<"\n Queue is empty"<<endl;}
31 else{
32 item=q[Front];
33 cout<<"\n Deleted item: "<<q[Front]<<endl;
34 if(Front==rear)
35 Front=rear=-1;
36 else
37 Front=Front+1;
38 }
39 }
40 void display()
41 {
42 cout<<"\n The Queue elements are: ";
43 for(int i=Front;i<=rear;i++){
44 cout<<q[i]<<" ";
45 }
46 }
47
48
49 int main()
50 {
51 x:
52 cout<<"\n Operation to be done:\n 1.EnQueue.\n 2.DeQueue. \n 3.Display. \n 4.exit.\n";
53 cout<<"\n Enter your choice(1-4): ";
54 cin>>n;
55 switch(n){
56 case 1:
Logs & others
F:\2nd yr notes\data structure lab\EX4\EX4\main.cpp
Windows (CR+LF)
WINDOWS-1252
Line 24, Column 6
Insert
Read/Write
default


main.cpp - Code::Blocks 16.01
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
addq(int item) : void
Management
Projects Symbols Files
Workspace
Start here
main.cpp
45 }
46 }
47
48
49 int main()
50 {
51 x:
52 cout<<"\n Operation to be done:\n 1.EnQueue.\n 2.DeQueue. \n 3.Display. \n 4.exit.\n";
53 cout<<"\n Enter your choice(1-4): ";
54 cin>>n;
55 switch(n){
56 case 1:
57 addq(item);
58 goto x;
59 break;
60 case 2:
61 delq(item);
62 goto x;
63 break;
64 case 3:
65 display();
66 goto x;
67 break;
68 case 4:
69 exit(0);
70 }
71
72 }
73
Logs & others
F:\2nd yr notes\data structure lab\EX4\EX4\main.cpp
Windows (CR+LF)
WINDOWS-1252
Line 24, Column 6
Insert
Read/Write
default

```
"F:\2nd yr notes\data structure lab\EX4\EX4\main.exe"

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1


Enter the element for insertion: 10

Inserted element is: 10

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1


Enter the element for insertion: 20

Inserted element is: 20

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1


Enter the element for insertion: 30

Inserted element is: 30

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
```

```
"F:\2nd yr notes\data structure lab\EX4\EX4\main.exe"
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1


Enter the element for insertion: 40

Inserted element is: 40

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1


Enter the element for insertion: 50

Inserted element is: 50

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 1

Queue is full

Operation to be done:
1.EnQueue.
2.DeQueue.
3.Display.
4.exit.

Enter your choice(1-4): 3

The Queue elements are: 10 20 30 40 50
```

VIDEO URL:

https://youtu.be/hHqMM01p0O0

RESULT:

The program of array implementation of queue is implemented successfully and the output is verified.