LAB 03

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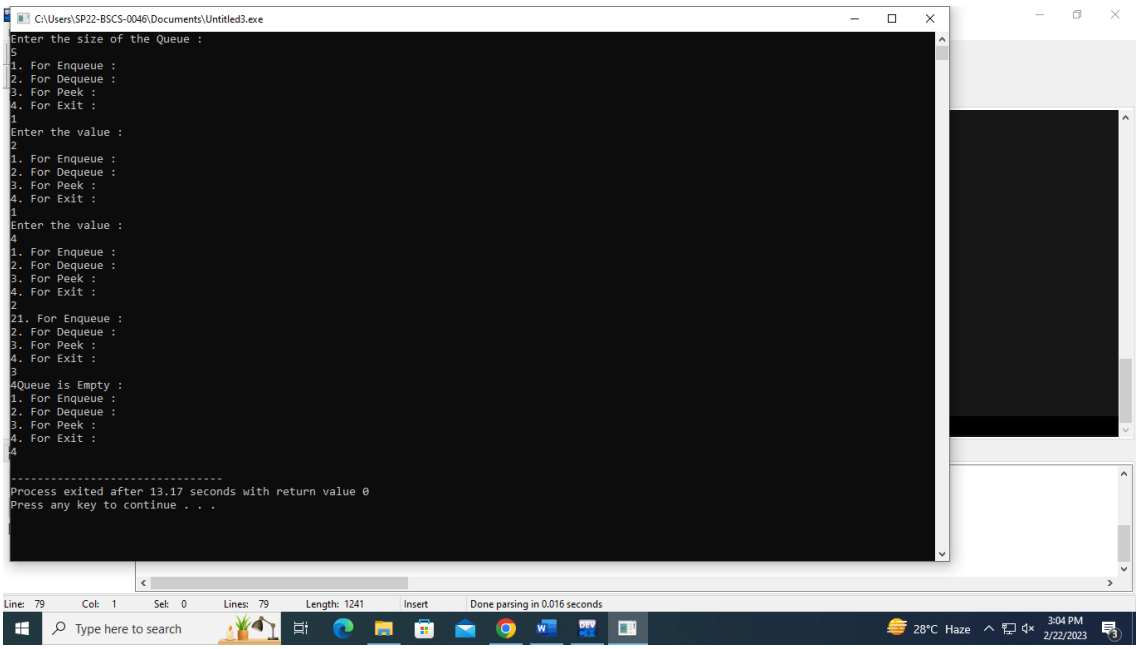
SP22-BSCS-0046

1. Implement Queue.
   SOURCE CODE:

```
#include<iostream>
using namespace std;


class Queue{
        private:
                int front;
                int rare;
                int arr_queue[];
                int queuesize;

                public:
                        Queue(){
                                front = -1;
                                rare = -1;
                        }
                        Queue(int queuesize){
                                arr_queue[queuesize];
                        }
                        void enqueue(int value){
                                if(front == -1){
                                        front = 0;
                                }
                                if(rare < queuesize-1){
                                        arr_queue[++rare] = value;
                                }
                        }
                        void dequeue(){
                                if(front != -1){
                                        cout<<arr_queue[front++];
                                }
                                else{
                                        cout<<"Queue is Empty : "<<endl;
                                }
                        }
                        void peek(){
                                if(front != -1){
```

```
                                        cout<<arr_queue[front];
                                }
                                cout<<"Queue is Empty : "<<endl;
                        }
};

int main()
{
        Queue obj;

        int option;
        int value;

        cout<<"Enter the size of the Queue :"<<endl;
        cin>>value;


        do{
                cout<<"1. For Enqueue : "<<endl;
                cout<<"2. For Dequeue : "<<endl;
                cout<<"3. For Peek : "<<endl;
                cout<<"4. For Exit : "<<endl;
                cin>>option;
                if(option == 1){
                        cout<<"Enter the value : "<<endl;
                        cin>>value;
                        obj.enqueue(value);
                }
                else if(option == 2){
                        obj.dequeue();
                }
                else if(option == 3){
                        obj.peek();
                }
                else{
                        option = 0;
                }
        }while(option != 0);

        return 0;
}
```

PICTURE:



2. Implement Circular Queue.

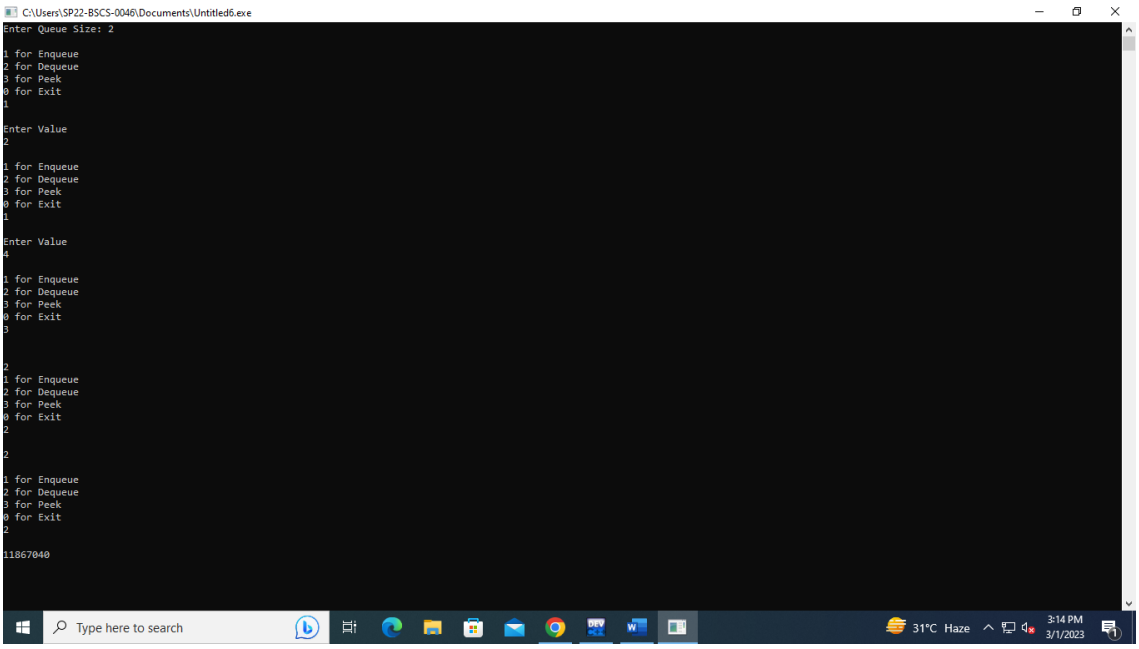
SOURCE CODE:

```
#include<iostream>
using namespace std;

//Implement Queue

class Queue{
        private:
                int front,rear;
                int queuesize;
                int arr_queue[];

        public:
                Queue(){
                        front = -1;
                        rear = -1;
                        cout<<"Enter Queue Size: ";
                        cin>>queuesize;
                        arr_queue[queuesize];
                }
                void enqueue(int value){
                        if(front == -1){
                                front = 0;
                        if(rear < queuesize - 1){
                                rear =(rear+1)%queuesize;
```

```
                    arr_queue[rear] = value;
                }
            }
        }
        void dequeue(){
            if(!front != -1 && front<queuesize){
                cout<<arr_queue[front]<<endl;
                front = (front+1)%queuesize;
            }
        }
        void peek(){
            if(front != -1){
                cout<<arr_queue[front];

            }
        }
        };
int main(){
    Queue Q1;
    int qsize;
    int option;
    int value;

        do{
        cout<<endl;
        cout<<"1 for Enqueue"<<endl;
        cout<<"2 for Dequeue"<<endl;
        cout<<"3 for Peek"<<endl;
        cout<<"0 for Exit"<<endl;
        cin>>option;
        cout<<endl;

        if(option ==1){
            cout<<"Enter Value"<<endl;
            cin>>value;
            Q1.enqueue(value);

        }
        else if(option == 2){
            Q1.dequeue();
        }
        else if(option == 3){
            cout<<endl;
            Q1.peek();
```

```
                }
                else{
                        option = 0;
                }
                }while(option != 0);

}
```

PICTURE:



3. Implement Dequeue.

SOURCE CODE:

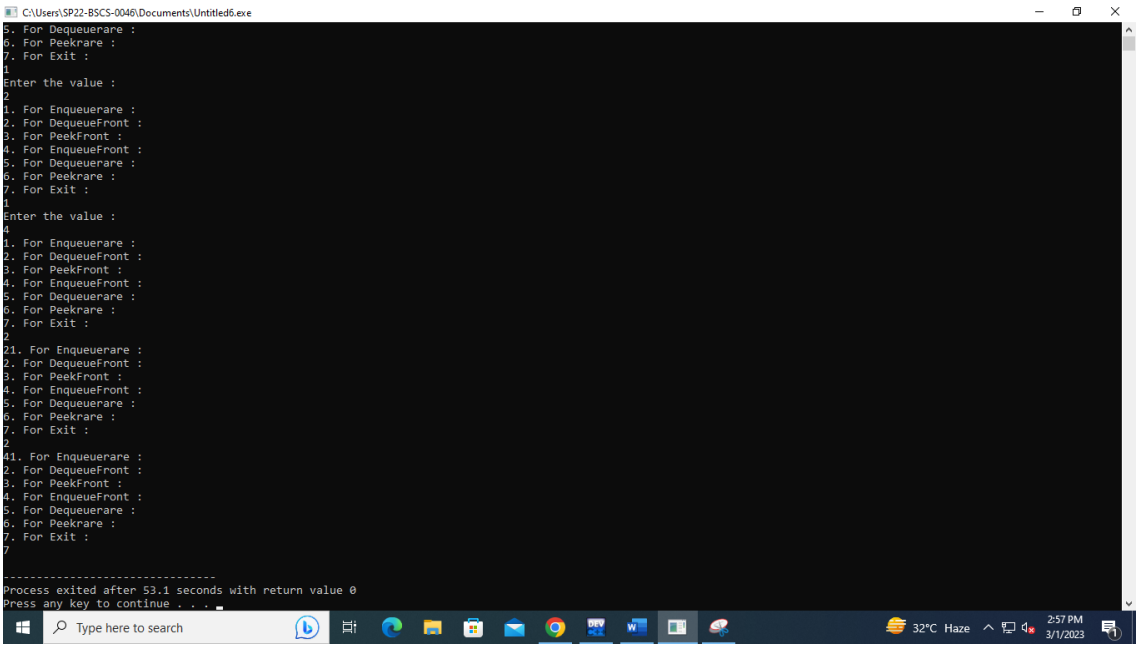
```
#include<iostream>
using namespace std;


class Queue{
        private:
                int front;
                int rare;
                int arr_queue[];
                int queuesize;

                public:
                        Queue(){
                                front = -1;
```

```
		rare = -1;
	}
	Queue(int queuesize){
		arr_queue[queuesize];
	}
	void enqueuerare(int value){
		if(front == -1){
			front = 0;
		}
		if(rare < queuesize-1){
			arr_queue[++rare] = value;
		}
	}
	void dequeuefront(){
		if(front != -1){
			cout<<arr_queue[front++];
		}
		else{
			cout<<"Queue is Empty : "<<endl;
		}
	}
	void peekfront(){
		if(front != -1){
			cout<<arr_queue[front];
		}
		cout<<"Queue is Empty : "<<endl;
	}


	//
	================================================================================


	void enqueuefront(int value){
		if(rare == -1){
			rare = 0;
		}
		if(front < queuesize-1){
			arr_queue[++front] = value;
		}
	}
	void dequeuerare(){
		if(rare != -1 && rare < queuesize){
```

```
                cout<<arr_queue[rare--];
            }
            else{
                cout<<"Queue is Empty : "<<endl;
            }
        }
        void peekrare(){
            if(front != -1){
                cout<<arr_queue[front];
            }
            cout<<"Queue is Empty : "<<endl;
        }
};

int main()
{
    Queue obj;

    int option;
    int value;

    cout<<"Enter the size of the Queue :"<<endl;
    cin>>value;


    do{
        cout<<"1. For Enqueuerare : "<<endl;
        cout<<"2. For DequeueFront : "<<endl;
        cout<<"3. For PeekFront : "<<endl;
        cout<<"4. For EnqueueFront : "<<endl;
        cout<<"5. For Dequeuerare : "<<endl;
        cout<<"6. For Peekrare : "<<endl;
        cout<<"7. For Exit : "<<endl;
        cin>>option;
        if(option == 1){
            cout<<"Enter the value : "<<endl;
            cin>>value;
            obj.enqueuerare(value);
        }
        else if(option == 2){
            obj.dequeuefront();
        }
        else if(option == 3){
            obj.peekfront();
```

```
                }
                else if(option == 4){
                        obj.enqueuefront(value);
                }
                else if(option == 5){
                        obj.dequeuerare();
                }
                else if(option == 6){
                        obj.peekrare();
                }
                else{
                        option = 0;
                }
        }while(option != 0);

        return 0;
}
```

PICTURE:



4. Implement Stack using Queue.
   SOURCE CODE:
   PICTURE:

5. Implement Queue using Stack.
   SOURCE CODE:

```
#include<iostream>
using namespace std;
```

```
const int n = 100;


class Stack {
private:
   int arr[n];
          int top;
public:
   Stack() {
      top = -1;
   }

                    void push(int a){
                              if(top<n-1){
                                        arr[++top] = a;
                              }
                              else{
                                        cout<<"Stack is Full";
                              }
                    }

                    int peak(){
                              return arr[top];
                    }

                    void pop(){
                              if(top>-1){
                                        arr[top--];
                              }
                              else{
                                        cout<<"Stack is underflow"<<endl;
                              }
                    }

                    bool empty(){
                              if(top > -1){
                                        return 0;
                              }
                              else{
                                        return 1;
                              }
                    }
```

```
};

class queue{
	Stack s1,s2;

	public:

	void enqueue(int value){
		while(!s1.empty()){
			s2.push(s1.peak());
			s1.pop();
		}

		s1.push(value);

		while(!s2.empty()){
			s1.push(s2.peak());
			s2.pop();
		}
	}


	void dequeue(){
		if(s1.empty()){
			cout<< "Queue is Empty";
		}
		else{
			int x = s1.peak();
			s1.pop();
			cout<<x<<endl;
		}
	}

};

int main(){
	queue q;



	int option,a;
	while(true){
		cout<<"ENTER 1 FOR ENQUEUE"<<endl;
		cout<<"ENTER 2 FOR DEQUEUE"<<endl;
```

```
                cout<<"ENTER 0 FOR EXIT"<<endl;
                cout<<"ENTER YOUR CHOICE: "<<endl;
                cin>>option;
                if(option==1){
                        cout<<"VALUE FOR ENQUEUE:"<<endl;
                        cin>>a;
                        q.enqueue(a);
                }
                else if(option==2){
                        q.dequeue();
                }
                else if(option == 0){
                        break;
                }
                else{
                        cout<<"Wrong Input";
                }
        }


   return 0;
}
```

PICTURE: