**DSA LAB ASSIGNMENT SUBMISSION**

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LAB 5 :

Q1. #include <iostream>

using namespace std;

int queue[100], n = 100, front = - 1, rear = - 1;

void isFull(){

     if (rear == n - 1)

   cout<<"Queue Overflow"<<endl;

}

void isEmpty(){

     if (front == - 1 || front > rear) {

      cout<<"Queue Underflow ";

     }

}

int peek()

{

    if (front == - 1 || front > rear)

    {

        cout << "Underflow\nProgram Terminated\n";

        exit(EXIT\_FAILURE);

    }

    return queue[front];

}

void Insert() {

   int val;

   if (rear == n - 1)

   cout<<"Queue Overflow"<<endl;

   else {

      if (front == - 1)

      front = 0;

      cout<<"Insert the element in queue : "<<endl;

      cin>>val;

      rear++;

      queue[rear] = val;

   }

}

void Delete() {

   if (front == - 1 || front > rear) {

      cout<<"Queue Underflow ";

      return ;

   } else {

      cout<<"Element deleted from queue is : "<< queue[front] <<endl;

      front++;;

   }

}

void Display() {

   if (front == - 1)

   cout<<"Queue is empty"<<endl;

   else {

      cout<<"Queue elements are : ";

      for (int i = front; i <= rear; i++)

      cout<<queue[i]<<" ";

         cout<<endl;

   }

}

int main() {

   int ch;

   do {

      cout<<"Enter your choice : "<<endl;

      cin>>ch;

      switch (ch) {

         case 1: Insert();

         break;

         case 2: Delete();

         break;

         case 3: Display();

         break;

         case 4: isFull();

         break;

         case 5: isEmpty();

         break;

         case 6 : peek();

         break;

         case 7: cout<<"exit"<<endl;

         break;

         default: cout<<"Invalid choice"<<endl;

      }

   } while(ch!=7);

   return 0;

}

Output :

Enter your choice :

1

Insert the element in queue :

10

Enter your choice :

1

Insert the element in queue :

20

Enter your choice :

3

Queue elements are : 10 20

Enter your choice :

2

Element deleted from queue is : 10

Enter your choice :

2

Element deleted from queue is : 20

Enter your choice :

6

Underflow

Program Terminated

Q2 . #include<iostream>

using namespace std;

int queue[100];

int size;

int front=-1,rear=-1;

void enqueue(int data){

if((rear+1)%size==front){

cout<<"Queue is full";

}

else if(front==-1 && rear==-1){

front=rear=0;

queue[rear]=data;

cout<<"Data added"<<endl;

}

else{

rear=(rear+1)%size;

queue[rear]=data;

cout<<"Data added"<<endl;

}

}

void dequeue(){

int data;

if(front==-1&&rear==-1){

cout<<"Empty queue"<<endl;

}

else if(front==rear){

front=rear=-1;

}

else{

data=queue[front];

cout<<"Element dequeued "<<data<<endl;

front=(front+1)%size;

}

}

void display(){

int i;

printf("\n Front -> %d", front);

printf("\n Items -> ");

for( i = front; i!=rear; i=(i+1)%size) {

printf("%d",queue[i]);

}

printf("%d",queue[i]);

printf("\n Rear -> %d \n",rear);

}

bool isEmpty() {

    if (front == rear){

        return true;

    }

    return false;

}

bool isFull() {

    if ((rear + 1) % size == front){

        return true;

    }

    return false;

}

int main(){

int choice=1, data;

cout<<"Enter size"<<endl;

cin>>size;

while(1){

cout<<"enter the choice "<<endl;

cin>>choice;

switch(choice){

case 1: cout<<"Enter the data"<<endl;

cin>>data;

enqueue(data);

break;

case 2:dequeue();

break;

case 3: display();

break;

case 4: isFull();

break;

case 5: isEmpty();

break;

case 0:exit(0);

break;

default: cout<<"Invalid case"<<endl;

break;

}

}

}

Output :

Enter size

2

enter the choice

1

Enter the data

10

Data added

enter the choice

1

Enter the data

20

Data added

enter the choice

3

Front -> 0

Items -> 10

20

Rear -> 1

enter the choice

2

Element dequeued 10

enter the choice

3

Front -> 1

Items -> 20

Rear -> 1