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Q batch Comp-2

Group E-31

A double-ended queue (deque) is a linear list in which additions and deletions may be

made at either end. Obtain a data representation mapping a deque into a one

dimensional array. Write C++ program to simulate deque with functions to add and

delete elements from either end of the deque

#include <iostream>

using namespace std;

#define SIZE 10

class DEQUE

{

int a[SIZE];

int front, rear, count;

public:

DEQUE(){

front = -1;

rear = -1;

count = 0;

}

void addBegin(int item){

if (count == SIZE){

cout << "\nInsertion is not possible, overflow!";

return;

}

if (front == -1){

front = rear = 0;

}else{

for (int i = rear; i >= front; i--){

a[i + 1] = a[i];

}

rear++;

}

a[front] = item;

count++;

}

void addEnd(int item){

if (count == SIZE){

cout << "\nInsertion is not possible, overflow!";

return;

}

if (front == -1){

front = rear = 0;

}else{

rear++;

}

a[rear] = item;

count++;

}

void deleteFront(){

if (front == -1){

cout << "Deletion is not possible: DEQUE is empty";

return;

}

cout << "The deleted element is " << a[front];

if (front == rear){

front = rear = -1;

}else{

front++;

}

count--;

}

void deleteEnd(){

if (front == -1){

cout << "Deletion is not possible: DEQUE is empty";

return;

}

cout << "The deleted element is " << a[rear];

if (front == rear){

front = rear = -1;

}else{

rear--;

}

count--;

}

void display(){

if (front == -1){

cout << "DEQUE is empty";

return;

}

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

cout << a[i] << " ";

}

cout << endl;

}

};

int main(){

int choice, item;

DEQUE d1;

do{

cout << "\n\n\*\*\*\*DEQUE OPERATION\*\*\*\*\n";

cout << "1-Insert at beginning\n";

cout << "2-Insert at end\n";

cout << "3-Display\n";

cout << "4-Deletion from front\n";

cout << "5-Deletion from rear\n";

cout << "6-Exit\n";

cout << "Enter your choice (1-6): ";

cin >> choice;

switch (choice){

case 1:

cout << "Enter the element to be inserted: ";

cin >> item;

d1.addBegin(item);

break;

case 2:

cout << "Enter the element to be inserted: ";

cin >> item;

d1.addEnd(item);

break;

case 3:

d1.display();

break;

case 4:

d1.deleteFront();

break;

case 5:

d1.deleteEnd();

break;

case 6:

cout << "Exiting the program\n";

break;

default:

cout << "Invalid choice\n";

break;

}

}while (choice != 6);

return 0;

}

OUTPUT

\*\*\*\*DEQUE OPERATION\*\*\*\*

1-Insert at beginning

2-Insert at end

3-Display

4-Deletion from front

5-Deletion from rear

6-Exit

Enter your choice (1-6): 1

Enter the element to be inserted: 23

\*\*\*\*DEQUE OPERATION\*\*\*\*

1-Insert at beginning

2-Insert at end

3-Display

4-Deletion from front

5-Deletion from rear

6-Exit

Enter your choice (1-6): 2

Enter the element to be inserted: 33

\*\*\*\*DEQUE OPERATION\*\*\*\*

1-Insert at beginning

2-Insert at end

3-Display

4-Deletion from front

5-Deletion from rear

6-Exit

Enter your choice (1-6):