**Practical GroupE\_20**

**Aim:**

Consider a scenario for Hospital to cater services to different kinds of patients as Serious (top priority), b) non-serious (medium priority), c) General Checkup (Least priority). Implement the priority queue to cater services to the patients.

**Code:**

#include<iostream>

#define N 20

#define SERIOUS 10

#define NONSERIOUS 5

#define CHECKUP 1

using namespace std;

string Q[N];

int Pr[N];

int r = -1, f = -1;

void enqueue(string data,int p)//Enqueue function to insert data and its priority in queue

{

int i;

if((f==0)&&(r==N-1)) //Check if Queue is full

cout<<"Queue is full";

else {

if(f==-1) { //if Queue is empty

f = r = 0;

Q[r] = data;

Pr[r] = p;

}

else if(r == N-1) { //if there there is some elemets in Queue

for(i=f;i<=r;i++) {

Q[i-f] = Q[i];

Pr[i-f] = Pr[i];

r = r-f;

f = 0;

for(i = r;i>f;i--) {

if(p>Pr[i]) {

Q[i+1] = Q[i];

Pr[i+1] = Pr[i];

}

else break;

Q[i+1] = data;

Pr[i+1] = p;

r++;

}

}

}

else {

for(i = r;i>=f;i--) {

if(p>Pr[i]) {

Q[i+1] = Q[i];

Pr[i+1] = Pr[i];

}

else break;

}

Q[i+1] = data;

Pr[i+1] = p;

r++;

}

}

}

void print() { //print the data of Queue

int i;

if(f == -1){

cout<<"No records found\n";

return;

}

for(i=f;i<=r;i++) {

cout << "Patient's Name - "<<Q[i];

switch(Pr[i]) {

case 1:

cout << " Priority - 'Checkup' " << endl;

break;

case 5:

cout << " Priority - 'Non-serious' " << endl;

break;

case 10:

cout << " Priority - 'Serious' " << endl;

break;

default:

cout << "Priority not found" << endl;

}

}

}

void dequeue() { //remove the data from front

if(f == -1) {

cout<<"Queue is Empty";

}

else {

cout<<"deleted Element ="<<Q[f]<<endl;

cout<<"Its Priority = "<<Pr[f]<<endl;

if(f==r) f = r = -1;

else f++;

}

}

int main() {

string data;

int opt = 0, p;

while(opt != 4){

cout<<"----- PRIORITY QUEUE -----\n";

cout<<"1. Insert data\n2. Display data\n3. Delete data\n4. Exit\n";

cout<<"Enter your choice: ";

cin>>opt;

switch(opt){

case 1:

cout<<"Enter patient name: ";

cin>>data;

cout<<"Enter priority of patient(1 - Serious, 2 - Non-serious, 3 - General checkup): ";

cin>>p;

switch (p){

case 1:

enqueue(data, SERIOUS);

break;

case 2:

enqueue(data, NONSERIOUS);

break;

case 3:

enqueue(data, CHECKUP);

break;

default:

cout<<"Enter valid priority value!\n";

break;

}

break;

case 2:

print();

break;

case 3:

dequeue();

break;

case 4:

cout<<"\*\*\*\*\* Exited \*\*\*\*\*\n";

break;

default:

cout<<"Enter valid option!\n";

break;

}

}

return 0;

}