**Assignment no 10  
Title: Heap data structure**

Code:  
#include<iostream>

#include<math.h>

using namespace std;

#define max1 20

class stud {

public:

int marks[max1], total;

stud() {

for(int i = 0; i < max1; i++)

marks[i] = 0;

}

void createHeap();

void displayHeap();

void showmax();

void showmin();

};

void stud::createHeap() {

int i, j, par, temp, M;

cout << "\n Enter How many Stu : ";

cin >> total; // e.g. 5

for(i = 0; i < total; i++) {

cout << "\n Enter Marks : ";

cin >> marks[i];

M = marks[i];

j = i; // j is child

par = floor((j - 1) / 2);

while(marks[j] < marks[par] && j != 0) {

temp = marks[j];

marks[j] = marks[par];

marks[par] = temp;

j = par;

par = floor((j - 1) / 2);

}

cout << "\n\n Current Heap : After Inserting : " << M << " is : \n";

displayHeap();

}

}

void stud::displayHeap() {

int i = 0, space = 6;

cout << endl;

while(i < total) {

if(i == 0 || i == 1 || i == 3 || i == 7 || i == 15) {

cout << endl << endl;

for(int j = 0; j < space; j++)

cout << " ";

space -= 2;

}

cout << " " << marks[i];

i++;

}

cout << endl;

}

void stud::showmin() {

cout << "\nMinimum Marks: " << marks[0] << endl;

}

void stud::showmax() {

int max = marks[0];

for(int i = 1; i < total; i++) {

if(max < marks[i])

max = marks[i];

}

cout << "\nMaximum Marks: " << max << endl;

}

int main() {

stud s1;

int ch, ans;

do {

cout << "\n 1. Insert Marks ";

cout << "\n 2. Display Marks ";

cout << "\n 3. Show Max Marks ";

cout << "\n 4. Show Min Marks ";

cout << "\n\n Enter Your Choice : ";

cin >> ch;

switch(ch) {

case 1:

s1.createHeap();

break;

case 2:

s1.displayHeap();

break;

case 3:

s1.showmax();

break;

case 4:

s1.showmin();

break;

default:

cout << "Invalid choice!";

}

cout << " \n Do u want to continue : (1 for continue )";

cin >> ans;

} while(ans == 1);

return 0;

}  
  
Output:  
