KLASE - OSNOVNI POJMOVI, ENKAPSULACIJA PODATAKA

1. Na programskom jeziku C++ napisati klasu Tacka koja predstavlja tačke u ravni i implementirati metode kojima se definišu osnovne operacije sa tačkama. Napisati i glavni program koji testira rad i ponašanje objekata date klase.

```cpp
#pragma once
#include <cmath>
#include <iostream>
using namespace std;

class Tacka
{
   double x, y; // Koordinate.
public:
   void postavi(double a, double b); // Postavljanje koordinata.
   double aps () const { return x; } // Apscisa.
   double ord () const { return y; } // Ordinata.
   double rastojanje (Tacka) const; // Rastojanje do tacke.
   void pisi() const;


   friend Tacka citajF (); // Citanje tacke.
   friend void pisiF (Tacka); // Pisanje tacke.
};
```

Tacka/Tacka.h

```cpp
#include "Tacka.h"

void Tacka::postavi(double a, double b)
{
   x = a; y = b;
}

double Tacka::rastojanje(Tacka t) const // Rastojanje do tacke.
{
   return sqrt (pow(x - t.x, 2) + pow(y - t.y, 2));
}

void Tacka::pisi() const
{
   cout << '(' << x << ", " << y << ')';
}

Tacka citajF() // Citanje tacke.
{
   Tacka t;
```

```cpp
21     cin >> t.x >> t.y;
22     return t;
23 }
24
25 void pisiF(Tacka t) // Pisanje tacke.
26 {
27     cout << '(' << t.x << ", " << t.y << ')';
28 }
```

Tacka/Tacka.cpp

```cpp
1 #include "Tacka.h"
2
3 int main()
4 {
5     cout << "t1? ";
6     double x, y;
7     cin >> x >> y;
8     Tacka t1;
9     t1.postavi(x, y);
10    cout << "t2? ";
11    Tacka t2 = citajF();
12    cout << "t1=(" << t1.aps() << ',' << t1.ord() << "), t2=";
13    //pisiF(t2);
14    t2.pisi();
15    cout << endl;
16    cout << "Rastojanje=" << t1.rastojanje(t2) << endl;
17    return 0;
18 }
```

Tacka/Source.cpp

2. Napisati na programskom jeziku C++ klasu za rad sa trouglovima i glavni program koji prikazuje njeno funkcionisanje (učitava i sortira trouglove prema površini).

```cpp
1 #pragma once
2 #include <iostream>
3 using namespace std;
4
5 class Trougao
6 {
7     double a, b, c; // private!!
8 public:
9     friend bool moze(double a, double b, double c);
10
11    void postavi(double aa, double bb, double cc);
12    double uzmiA() const;
13    double uzmiB() const;
14    double uzmiC() const; // geteri
15    double Obim() const;
16    double Povrsina() const;
17    bool citaj();
18    void pisi() const;
19 };
```

Trougao/Trougao.h

```cpp
1  #include "Trougao.h"
2
3  bool moze(double a, double b, double c)
4  {
5      return (a > 0) && (b > 0) && (c > 0)
6          && (a + b > c) && (b + c > a)
7          && (a + c > b);
8  }
9
10 void Trougao::postavi(double a, double b,
11     double c)
12 {
13     if (!moze(a, b, c)) exit(1); // return;
14     this->a = a;
15     this->b = b;
16     this->c = c;
17 }
18
19 double Trougao::uzmiA() const
20 {
21     return a;
22 }
23
24 double Trougao::uzmiB() const
25 {
26     return b;
27 }
28
29 double Trougao::uzmiC() const
30 {
31     return c;
32 }
33
34 double Trougao::Obim() const
35 {
36     return a + b + c;
37 }
38
39 double Trougao::Povrsina() const
40 {
41     double s = Obim() / 2;
42     return sqrt(s * (s - a) * (s - b) * (s - c));
43 }
44
45 bool Trougao::citaj()
46 {
47     double aa, bb, cc;
48     cin >> aa >> bb >> cc;
49     if (!moze(aa, bb, cc)) {
50         return false;
51     }
52     a = aa;
53     b = bb;
54     c = cc;
55     return true;
56 }
57
58 void Trougao::pisi() const
59 {
60     cout << "Troug(" << a << "," << b << ","
```

```
61        << c << ")";
62 }
```

Trougao/Trougao.cpp

```cpp
1  #include "Trougao.h"
2
3  int main()
4  {
5      cout << "Broj trouglova? ";
6      int n;
7      cin >> n;
8
9      Trougao* niz = new Trougao[n];
10
11     for (int i = 0; i < n; )
12         {
13         cout << i + 1 << ". trougao? ";
14         double a, b, c;
15         cin >> a >> b >> c;
16         if (Trougao::moze(a, b, c))
17             niz[i++].postavi(a, b, c);
18         else
19             cout << "*** Neprihvatljive stranice!\n";
20     }
21
22     for (int i = 0; i < n - 1; i++)
23     {
24         for (int j = i + 1; j < n; j++)
25         {
26             if (niz[j].Povrsina() < niz[i].Povrsina())
27             {
28                 Trougao pom = niz[i];
29                 niz[i] = niz[j];
30                 niz[j] = pom;
31             }
32         }
33     }
34
35     cout << "\nUredjeni niz trouglova:\n";
36     for (int i = 0; i < n; i++)
37     {
38         cout << i + 1 << ": ";
39         niz[i].pisi();
40         cout << " P=" << niz[i].Povrsina() << endl;
41     }
42
43     delete[] niz;
44     return 0;
45 }
```

Trougao/Source.cpp