

Računske vježbe 3

Programabilni uređaji i objektno orijentisano programiranje

1. Projektovati klasu `Rectangle` koja predstavlja pravougaonik. Napisati metode za računanje površine i obima, kao i metodu koja štampa visinu i širinu pravougaonika.

```
1 #include <iostream>
2 using namespace std;
3
4 class Rectangle
5 {
6 private:
7     double height;
8     double width;
9 public:
10    Rectangle(){};
11    Rectangle(double, double);
12    double area();
13    double perimeter();
14    void print();
15    double getHeight() const {return height;};
16    double getWidth() const {return width;};
17 };
18
19 Rectangle::Rectangle(double height, double width) : height(height), width(width) {}
20
21 double Rectangle::area()
22 {
23     return height * width;
24 }
25
26 double Rectangle::perimeter()
27 {
28     return 2 * (height + width);
29 }
30
31 void Rectangle::print()
32 {
33     cout << "Visina pravougaonika je: " << height << ", a sirina: " << width << endl;
34 }
35
36 int main()
37 {
38     double height, width;
39     cout << "Unesite visinu i sirinu pravougaonika:" << endl;
40     cin >> height >> width;
41     Rectangle rectangle(height, width);
42     rectangle.print();
43     cout << "Povrsina pravougaonika je: " << rectangle.area() << ", dok je obim: " <<
44     rectangle.perimeter() << endl;
```

2. Realizovati klasu `Student` koja ima četiri podatka člana i to:

- godinu upisa (cijeli broj),
- redni broj studenta (pokazivač na cijeli broj),
- ime studenta (pokazivač na niz karaktera),
- javni statički podatak koji će služiti za brojanje ukupnog broja studenata (objekata date klase).

Klasa posjeduje konstruktor, destruktor i konstruktor kopije, kao i funkcije članice za pristup podacima članovima radi očitavanja i izmjene. Potrebno je realizovati i funkciju koja od dva studenta vraća ime onog koji je stariji (prije upisao studije).

```
1 #include <iostream>
2 #include <cstring>
3
4 using namespace std;
5
6 class Student
7 {
8 private:
9     int year;
10    int *number;
11    char *name;
12 public:
13    Student()
14    {
15        number = 0;
16        name = 0;
17        counter++;
18    }
19    Student(int, int, char *);
20    Student(const Student &);
21    ~Student();
22
23    int getYear() const {return year;}
24    int getNumber() const {return *number;}
25    char * getName() const {return name;}
26
27    void setYear(int _year) {year = _year;}
28    void setNumber(int _number)
29    {
30        if (number == 0) number = new int(_number);
31        else *number = _number;
32    }
33    void setName(char *_name)
34    {
35        delete [] name;
36        name = new char[strlen(_name) + 1];
37        strcpy(name, _name);
38    }
39
40    char * older(Student);
41
42    void print();
43
44    static int counter;
```

```

45 };
46
47 int Student::counter = 0;
48
49 Student::Student(int _year, int _number, char *_name) : year(_year)
50 {
51     number = new int(_number);
52     name = new char[strlen(_name) + 1];
53     strcpy(name, _name);
54     counter++;
55 }
56 Student::Student(const Student &student) : year(student.year)
57 {
58     number = new int(*student.number);
59     name = new char[strlen(student.name) + 1];
60     strcpy(name, student.name);
61     counter++;
62 }
63 Student::~~Student()
64 {
65     delete number;
66     number = 0;
67     delete [] name;
68     name = 0;
69     counter--;
70 }
71 char * Student::older(Student student)
72 {
73     if(year <= student.year)
74         return name;
75     else
76         return student.name;
77 }
78
79 void Student::print()
80 {
81     cout << "Ime studenta je: " << name << ", broj indeksa: " << *number << "/" <<
82     year << endl;
83 }
84
85 int main()
86 {
87     int year, number;
88     char name[20];
89
90     cout << "Unesite podatke za prvog studenta" << endl;
91     cin >> year >> number >> name;
92     Student student1(year, number, name);
93     student1.print();
94
95     cout << "Unesite podatke za drugog studenta" << endl;
96     cin >> year >> number >> name;
97     Student student2(year, number, name);
98     student2.print();
99
100     Student student3(student2);
101     cout << "Sada student 3 ima ime " << student3.getName() << endl;
102     cout << "Stariji je student " << student1.older(student2) << endl;
103     cout << "Ukupno je kreirano " << Student::counter << " studenata." << endl;

```

