Структури

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Дефиниране

Имена и типове на съставящите я полета

```
1 struct complex{
2   double re, im;
3 };
4
5 struct book{
6   char name[41], author[31];
7   int year;
8   double price;
9 };
```

```c
// МОЖЕ!
struct xx{
  int a,b,c;
};

struct pom{
  int a;
  double b;
  char c;
  xx d;
};
```

```c
// НЕ МОЖЕ!

struct st{
  // опит за рекурсивна деф.
  st member;
}
```

Пример

```cpp
#include <iostream>

struct Triangle{
  double a,b,c;
}

int main(){
  Triangle tr;

  std::cin>>tr.a;
  std::cin>>tr.b;
  std::cin>>tr.c;

  std::cout<< "a="<<tr.a<<std::endl;
  std::cout<< "b="<<tr.b<<std::endl;
  std::cout<< "c="<<tr.c<<std::endl;

  return 0;
}
```

Указатели към структури

```cpp
#include <iostream>

struct Triangle {
    double side1;
    double side2;
    double side3;
};


double calculateTriangleArea(const Triangle& triangle) {
    double s = (triangle.side1 + triangle.side2 + triangle.side3) / 2.0;
    return sqrt(s * (s - triangle.side1) * (s - triangle.side2) * (s - triangle.side3));
}

```

```cpp
int main() {
    int n;
    std::cout << "Enter the number of triangles: ";
    std::cin >> n;

    Triangle* triangles = new Triangle[n];

    for (int i = 0; i < n; ++i) {
        std::cout << "\nEnter information for Triangle " << i + 1 << ":" << std::endl;
        std::cout << "Enter length of Side 1: ";
        std::cin >> triangles[i].side1;

        std::cout << "Enter length of Side 2: ";
        std::cin >> triangles[i].side2;

        std::cout << "Enter length of Side 3: ";
        std::cin >> triangles[i].side3;
    }

    std::cout << "\nTriangle Information:" << std::endl;
    for (int i = 0; i < n; ++i) {
        std::cout << "\nTriangle " << i + 1 << ":\n";
        std::cout << "Side 1: " << triangles[i].side1 << std::endl;
        std::cout << "Side 2: " << triangles[i].side2 << std::endl;
        std::cout << "Side 3: " << triangles[i].side3 << std::endl;

        double area = calculateTriangleArea(triangles[i]);
        std::cout << "Area: " << area << std::endl;
    }

    delete[] triangles;

    return 0;
}
```

Абстракция със структури от данни

```cpp
struct Triangle {
    double side1;
    double side2;
    double side3;
};

// конструктор за структура
void makeTrianle(Triangle& tr, double a, double b, double c){
  tr.side1 = a;
  tr.side2 = b;
  tr.side3 = c;
}

// мутатор / setter
void setSide1(Triangle& tr, double newSide1){
  tr.side1 = newSide1;
}

// аксесор / getter
double getSide1(Triangle& tr){
  return tr.side1;
}
```

Край

Следва продължение…