Unions and Enumerations

12-4-2002

Opening Discussion

- What did we talk about last class?
- Do you have any questions about the assignment?
- Last class where we were writing code to do a roster of sports players, we have the player a field for status that I made an int. There were questions about this. Why would I pick an int? What are the advantages and disadvantages of that?

Enumerations

- C has a construct for representing small fixed sets of different types. It uses the keyword enum.
- Unlike using #defines, the enum actually declares a type that is associated with the names in the enumeration.
- Having a type makes the code safer in most situations because it moves logic errors into the realm of syntax errors.

Syntax of enum

▌ Like with a struct, an enum defines a type and we can name that type with a tag or a typedef.

```
enum Pstatus {ACTIVE,INJURED,SUSPENDED};
enum Pstatus stat1,stat2;
or
typedef enum {ACTIVE,INJURED,SUSPENDED}
    Pstatus;
Pstatus stat1,stat2;
stat1=active;
```

Motivation for Unions

▌ Sometimes you have a desire to make structures that can be one of several different types. For example, in the graphics code you have lights, triangles, and spheres. You might want to have a single array that stores everything. To do this you could put data in your struct for all of them and only use one, but that wastes space.

Unions

▌ A union is another user defined type that works like a structure, but it only gets enough memory for the largest field in it and the field share space so you can only safely use one.

▌ Typically you put a union in a structure and have a variable in the structure that tells you what "flavor" the union is in that case.

Union Syntax

▌ Unions are typically only found in structs because we need to type key. For this reason we rarely name them.

```
enum ObjType {LIGHT,TRIANGLE,SPHERE};
struct DrawObj {
    enum ObjType type;
    union {
        struct Light light;
        struct Triangle tri;
        struct Sphere sphere;
    } data;
};
```

Code

▌ Now lets write a little code that demonstrates this. The sports analogy works well here if we write code for stats is a sport where different players keep different stats.

Minute Essay

▌ Write a structure using a union that can represent different methods of getting places (car, bike, etc.).

▌ Quiz #6 will be given next class.