

```
typedef union {
    int i;
    double d;
} Number;
```

Next, we create an array whose elements are `Number` values:

```
Number number_array[1000];
```

Each element of `number_array` is a `Number` union. A `Number` union can store either an `int` value or a `double` value, making it possible to store a mixture of `int` and `double` values in `number_array`. For example, suppose that we want element 0 of `number_array` to store 5, while element 1 stores 8.395. The following assignments will have the desired effect:

```
number_array[0].i = 5;
number_array[1].d = 8.395;
```

Adding a “Tag Field” to a Union

Unions suffer from a major problem: there’s no easy way to tell which member of a union was last changed and therefore contains a meaningful value. Consider the problem of writing a function that displays the value currently stored in a `Number` union. This function might have the following outline:

```
void print_number(Number n)
{
    if (n contains an integer)
        printf("%d", n.i);
    else
        printf("%g", n.d);
}
```

Unfortunately, there’s no way for `print_number` to determine whether `n` contains an integer or a floating-point number.

In order to keep track of this information, we can embed the union within a structure that has one other member: a “tag field” or “discriminant,” whose purpose is to remind us what’s currently stored in the union. In the `catalog_item` structure discussed earlier in this section, `item_type` served this purpose.

Let’s convert the `Number` type into a structure with an embedded union:

```
#define INT_KIND 0
#define DOUBLE_KIND 1

typedef struct {
    int kind; /* tag field */
    union {
        int i;
        double d;
    } u;
} Number;
```