

More on Data Types

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Enumerated Data Types

An enumerated data type in C is one in which the permissible values of it can be specified during its definition.

```
// defining a enumerated data type primaryColor
enum primaryColor { red, yellow, blue };
// defining unnamed enumerated data type and declare variable color to be of that type
enum { red, yellow, blue } color;
```

This defines a enumerated data type primaryColor which can be assigned with only the three values specified above and nothing else. A variable of type enum primaryColor can be declared as

```
enum primaryColor myColor, yourColor;
myColor = red; // assigning value red to myColor
if (myColor == green) // using it in expressions
    printf("green!\n");
```

The C compiler actually treats enumeration identifiers as integer constants. Beginning with the first name on the list, the compiler assigns sequential integer values to these names starting with 0. So, red is 0, yellow 1 and blue is 2 above.

Specific integer values can also be associated with the identifiers by mentioning them explicitly.

```
enum direction { up, down, left=10, right };
// sequential values - up 1, down 2, left 10, right 11
```

Enumeration identifiers can also share same values.

```
enum switch { no=0, off=0, yes=1, on=1 };
```

Integer values can also be assigned explicitly to enumerated data types with type casting.

The typedef Statement

The typedef statement can be used to assign alternate names to data types. It is handled by the compiler during compilation stage and it is different than preprocessors.

```
typedef int Counter;
Counter i, j;

typedef char Linebuf[81];
Linebuf text; // same as below
char text[81] // same as above

typedef char *StringPtr;
StringPtr buffer; // same as below
char *buffer; // same as above
```

```
typedef struct {  
    float x;  
    float y;  
} Point; // defining an unnamed struct under the alias `Point`  
Point origin = { 0.0, 0.0 }, currentPoint;
```

The first example above could also have been done using `#define` preprocessor as `#define Counter int`. But the rest examples can't be done using preprocessor.