



Enumerated Types

PROBLEM SOLVING AND PROGRAM DESIGN In C
7th EDITION

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The **enum** Data Type

❖ The **enum** (enumerated **المعددة**) type definition syntax:

```
typedef enum  
    { identifier_list }  
enum_type ;
```



Example

- ❖ In a budget program you might distinguish among the following categories of expenses: *entertainment, rent, utilities, food, clothing, automobile, insurance and miscellaneous*. This can be done as follow:

```
typedef enum
{ entertainment, rent, utilities, food,
  clothing, automobile, insurance ,
  miscellaneous }
```



```
expense_t;
```

Example cont.

- ❖ Defining type **expense_t** as shown causes the enumeration constant *entertainment* to be represented as the integer **0**, constant *rent* to be represented as integer **1**, *utilities* as **2**, and so on.



Example cont.

- ❖ The new type name **expense_t** is used just as we would use a standard/simple data type. Here is a declaration of a variable **exp** with **expense_t** data type.

expense_t exp ;

- ❖ It is recommended that the enumerated type definition be placed after the preprocessor directives so it can be used all throughout the parts of the program (**global**)



Example 2

```
typedef enum  
{ monday, tuesday, wednesday,  
thursday, friday, saturday, sunday }  
  
day_t ;
```

- ❖ Interpretation: A new data type named **day_t** is defined. The valid values of this type are the identifiers of **identifier_list**. The first identifier is represented by the integer **0**, the second by the integer **1**, and so on.



Example 2 cont.

sunday < monday

wednesday != friday

tuesday >= sunday

- ❖ If **today** and **tomorrow** are of type **day_t** variables, the following **if** statement assigns the value of **tomorrow** based on the value of **today**:

if (today == sunday)

tomorrow = monday;

else

tomorrow = (day_t) (today + 1);



Example 3

- ❖ For enumerated type variables, the enumerated type definition must be done first, refer to the illustration below:

typedef enum

{ red, green, blue }

color_type;

- ❖ The variable can be then declared as follows:

color_type c ;

