

typedef and enum type

typedef : define new data type names (give another name to existing, or newly created, data type)

Examples :

- (1)

```
typedef float balance;  
balance saving, checking;
```
- (2)

```
struct employee  
{  
    int id;  
    char name[ARRAY_SIZE];  
    char gender;  
    int numDependents;  
    float payRate;  
};  
typedef struct employee EmployeeType;  
EmployeeType teachers[500];
```

Equivalent form:

- ```
typedef struct employee
{
 int id;
 char name[ARRAY_SIZE];
 char gender;
 int numDependents;
 float payRate;
} EmployeeType;
EmployeeType chairman;
```
- (3) 

```
typedef float ClassScores[20] ;
ClassScores test1, test2;
```

## **enumeration type (enum)**

**A user defined data type whose domain is an ordered set of literal values expressed as identifiers.**

Examples:

- (1) 

```
enum Days {SUN, MON, TUE, WED, THU, FRI, SAT};
```

notes: the identifiers are ordered : SUN < MON < TUE ... < SAT  
the default values for the identifiers are: SUN=0, MON=1, ...SAT=6, (but the values can be changed if necessary)

- (2) 

```
enum Vowel {'A', 'E', 'I', 'O', 'U'}; // wrong!! Why?
```
- (3) 

```
enum Animals {CAT, DOG, BIRD, HORSE, SHEEP, TIGER, LION};
Animals firstAnimal, secondAnimal, thirdAnimal;

// assignment statements
firstAnimal = CAT;
secondAnimal = DOG;
thirdAnimal = firstAnimal;
firstAnimal = 0; //wrong!
secondAnimal = 30; // wrong!
```

```
// increment
firstAnimal = Animals(firstAnimal + 1);
```

**enum used in switch statement:**

```
switch (firstAnimal)
{
case CAT: ...
 break;
case DOG: ...
 break;
case BIRD: ...
 break;
case HORSE: ...
 break;
case SHEEP: ...
 break;
case LION: ...
 break;
case TIGER: ...
 break;
}
```

**enum used in array subscripts**

- (1)     Animals    oneAnimal;  
        float     weights[7];
- ```
for (oneAnimal = CAT; oneAnimal <=TIGER;  Animals(oneAnimal++))
    cout << "The average weight for this animal is " << weights[oneAnimal] << endl;
```
- (2) const int NUM_COLORS=5;
 const int NUM_MAKERS=5;
- ```
enum Color {RED, ORANGE, GREY, WHITE, BLACK};
enum Maker {TOYOTA, HONDA, BMW, JAGUAR, NISSAN};

float crashRating[NUM_MAKERS][NUM_COLORS];

crashRating[TOYOTA][GREY] = 0.87;
...
crashRating[HONDA][BLACK] = 0.18;
```