Arrays Initialization

- You will want to assign initial values for the elements of your array most of the time.
  - ➔ Defining initial values for array elements makes it easier to detect when things go wrong,
- Just as you can assign initial values to variables when they are declared, you can also initial values to an array's elements.
- To initialize an array's values, simply provide the values in a list.
  - ➔ Values in the list are separated by commas and the entire list is enclosed in a pair of braces.

int counters[5] = {0,0,0,0,0,0 };

- Declares an array called counters to contain five integers values and initializes each of these elements to zero.

int integers[5] = {0,1,2,3,4};
- Declares an array named integers and sets the values of integers[0] to 0, integers[1] to 1, integer[2] to 2 and so on.
- It is not necessary to completely initialize an entire array.
- If fewer initial values are specified, only an equal number of elements are initialized.
  - ➔ Remaining values in the array are set to zero.

Float sample_data[500] = {100.0, 300.0, 500.5};
- Initializes the first three values of sample_data to 100.0, 300.0, and 500.5, and sets the remaining 497 elements to zero.

Designated initializers
- C99 added a feature called designated initializers.
  - ➔ Allows you to pick and choose which elements are initialized.
- By enclosing an element number in a pair of brackets, specific array elements can be initialized in any order.

Float sample_data[500] = {[2] = 500.5, [1] = 300.0, [0] = 100};
- Initializes the sample_data array to 100.0, 300.0, and 500.5 for the first three values.

int arr[6] = {[5] = 212}; // initialize arr[5] to 212

Example using designated initializers

```c
#include <stdio.h>
#define MONTHS 12
int main(void)
{
    int days[MONTHS] = {31,28, [4] = 31,30,31, [1] = 29};
    int i;

    for (i = 0; i < MONTHS; i++)
        printf("%2d  %d\n", i + 1, days[i]);

    return 0;
}
```

Repeating an initial value
- C does not provide any shortcut mechanisms for initializing arrays elements.
- No way to specify a repeat count
- If it were desired to initially set all 500 values of sample_data to 1 , all 500 would have to be explicitly assigned.
- To solve this problem, you will want to initialize the array inside the program using a loop.

Initializing all elements to the same value

```
int main (void)
{
    int  array_values[10] = { 0, 1, 4, 9, 16 };
    int  i;

    for ( i = 5;  i < 10;  ++i )
     array_values[i] = i * i;

    for ( i = 0;  i < 10;  ++i )
     printf ("array_values[%i] = %i\n", i, array_values[i]);

    return 0;
}
```