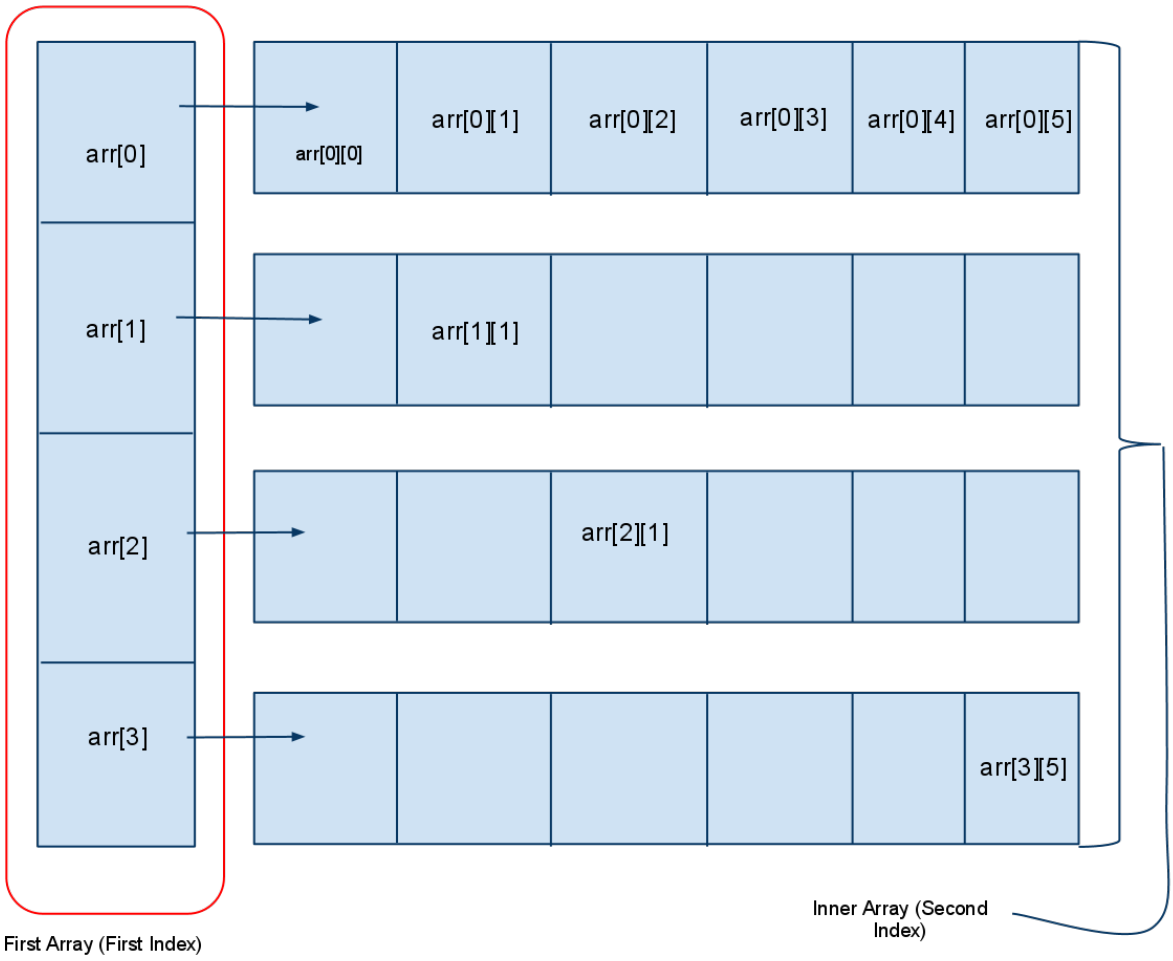
More Arrays!

What types of things can arrays hold?

Arrays can hold more than just primitives (eg. Int). They can also hold entire arrays. This is called a two dimensional array.



Syntax

Remember, after you index an array you can use it just like any normal variable. Therefore, after you index the first array you can then index the second one. You can also think of a 2D array like a table. The first index specifies the row in this table, and the second index specifies the column.

- Declaring a 10x10 2D-array: `int myInts[10][10]`
- Accessing the bottom left corner: `myInts[9][9]`
- In a scanf: `scanf("%d", &myInts[0][0])`

Going through a 2D-array

To go through a 1D-array, we use one for loop. Therefore, to go through a 2D array we use TWO for loops. Foe example, to print the entire 2D-array you do this:

```
int row, col;
for (row = 0; row < SIZE; row++)
{
   for (col = 0; col < SIZE; col++)
   {
      printf("%d", myInts[row][col]);
   }
   printf("\n");
}
```

Questions

1. Why is there that printf that just prints a newline in the above example?
2. Write the statement that declares a 3D-array of chars (let each array be 5 big).
3. Write the statement that declares a 5D-array of doubles (let each array be 5 big).

Program

Write me a program that prints out a pattern to the screen. Follow these specs:

1. Take in from the user the character to use for "filled in" squares.
2. Take in from the user the character to use for "empty" squares.
3. Make an 11x11 2D-array of chars (don't use magic number, use constants).
   1. In this array make an 'X' using the 2D array as coordinates.
      Ex: if you were using a 3x3 array, than the following locations would be "filled": (0,0), (0,2), (1,1), (2,0), and (2,2)
4. Print out this grid (2D-array).
5. When you scan in the characters, you will need a space before the %c. (`scanf(" %c", &myChar)`)

Sample run (Input is in **bold**)

```
Fill character: *
Empty character: -
*---------*
-*-------*-
--*-----*--
---*---*---
----*-*----
-----*-----
----*-*----
---*---*---
--*-----*--
-*-------*-
*---------*
```

Handin)

Email me your answers to the questions for both parts and the source code for your program. No need to attach it, just paste it directly into the email. If I don't respond to your email than you got it right!