# 2D Arrays

## Strings recap

– An array of chars
– We have a single identifier for the string
– Anything we can do with arrays, applies

### `char[]`


Notice the `\0` at the end! This means that C will know when it reaches the end of the array

Note the # of elements, and don't forget the `\0`

### String literals

***`"Jake!"`***

– uses double quotes `"` to wrap the string literal
– single quote for characters!
–
Used to assign strings to `char[]` easily:
`char name[] = "Jake Renzella";`

### Useful string functions

– `fgets()` -> reads a string
– `fputs()` -> prints a string
– `strlen()` -> gives us the length of the string (excluding the `\0`).
– `strcpy()` -> copy the contents of one string to another
– `strcat()` -> join one string to the end of another (concatenate)
– `strcmp()` -> compare two strings
–
`strchr()` -> find the first occurrence of a character
note: some of these may require `#include <string.h>`

### Reassigning a string

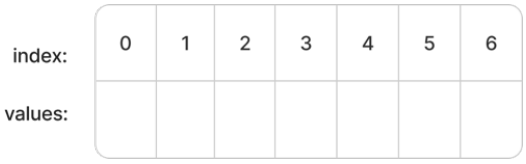
```
int main(void) {
    char name[MAX_LEN] = "Jake";
    strcpy(name, "Mr Otterington");
}
```

^ Remember we can't reassign like:

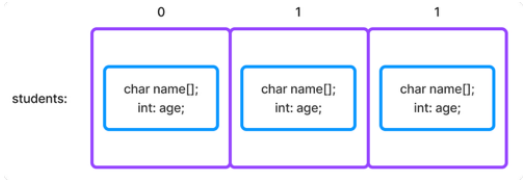
```
name = "Mr Otterington";
```

### 2D arrays

We can have arrays of type (char, int, struct, enum)




### Array of structs



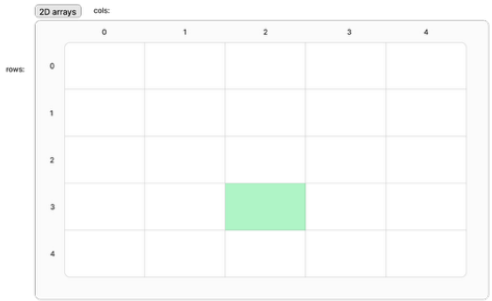

– Use `students[1].name;` to access element 1's name

### Array of arrays

#### 2D arrays

`<type> <identifier>[<rows>][<cols>];`

```
int my_grid[5][5];
my_grid[2][3];
```




### Visualisation

## Large demo Program

– An array of array of structs
– Battleships? Naughts and Crosses?

**Feedback**

https://forms.office.com/r/Ze4admEWnR