Week 07!

CLASS SEMESTER

Overview

Assignment 01

Congrats on finishing!

Questions?

How comfortable are we with 2D arrays now?
Any useful takeaways for assignment 2?

Pointers

First, some revision

Pointers

First, some revision

Difference between *int* / *char* and *int* */*char* *?

Pointers

First, some revision

Difference between *int* / *char* and *int** / *char** ? (diagram)

Pointers

First, some revision

Difference between *int* / *char* and *int* */*char* *?

How can we find the address of a variable?

Pointers

First, some revision

Difference between *int* / *char* and *int ** / *char **?

How can we find the address of a variable?

How could we use a pointer to access memory?

Pointers

```
int n = 42;
int *p;
int *q;
p = &n;
*p = 5;
*q = 17;
q = p;
*q = 8;
```

Coding with Functions and Pointers

CODE!

EOF Loops

A commonly used structure that allows us to scan inputs from command line (CLI) until user hits ctrl + d

```c
#include <stdio.h>

#define MAX_LETTERS 100

int main (void) {

    char my_var;
    while (scanf(" %c", &my_var) == 1) {
        printf("Input: %c\n", my_var);
    }

    return 0;
}
```

EOF Loops

We want to change this program to read line by line using functions and operators we have already seen in this course

```c
#include <stdio.h>

#define MAX_LETTERS 100

int main (void) {

    char my_var;
    while (scanf(" %c", &my_var) == 1) {
        printf("Input: %c\n", my_var);
    }

    return 0;
}
```

Command Line Arguments

What is argc?

Command Line Arguments

What is argc?

What is argv?

Command Line Arguments

How could we print the number of command line arguments?

How could we print all of the command line args with their indices?

Command Line Arguments

Important Points:

- argc is the count of CLA including the program name
- argv is an array of string, holding the CLA

Lab Time!

Any Questions?

malloc and Arrays

How much memory do we need for an int vs a double?

malloc and Arrays

How much memory do we need for an int vs a double?	sizeof()
How much memory is needed for an array of 10 integers?	

malloc and Arrays

*void *malloc(size_t size);*

How much memory do we need for an int vs a double?	sizeof()
How much memory is needed for an array of 10 integers?	10 * sizeof(int)
What are the arguments of malloc?	

malloc and Arrays

*void *malloc(size_t size);*

How much memory do we need for an int vs a double?	sizeof()
How much memory is needed for an array of 10 integers?	10 * sizeof(int)
What are the arguments of malloc?	size_t size (will cast from int automatically)
What is the return type of malloc?	

malloc and Arrays

*void *malloc(size_t size);*

How much memory do we need for an int vs a double?	sizeof()
How much memory is needed for an array of 10 integers?	10 * sizeof(int)
What are the arguments of malloc?	size_t size (will cast from int automatically)
What is the return type of malloc?	Void pointer, very special - never use

to malloc or not to malloc

to malloc

- Dynamically choose the size of an array
- Lets us change the size of arrays eventually
- Safely return a pointer towards the variable from the function

not to malloc

- Simpler to use
- We don't need to worry about free