Week 5 Lecture 1

Tools to help you

- DCC Help
- DCC Sidekick
- https://bytesized-prod.vercel.app

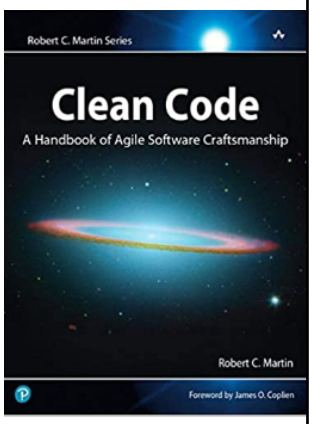
Style

How to write clean code

```c
struct thingy {
    int x;
    double y;
};

int calcualte_result(struct thingy x, struct thingy y)
{
    if((x.x - y.y) > (y.x - x.y)) {
    return 0;
    } else if ((y.x - x.y) > (x.x - y.y)) {
        return 1
    } else {
        return -1;
    }
}

int main(void) {
    struct thingy x;
    x.x = 50;
    x.y = 5.0;

    y.x = 45;
    y.x = 2.5;

    calculate_result(x, y);
}
```

Book suggestion

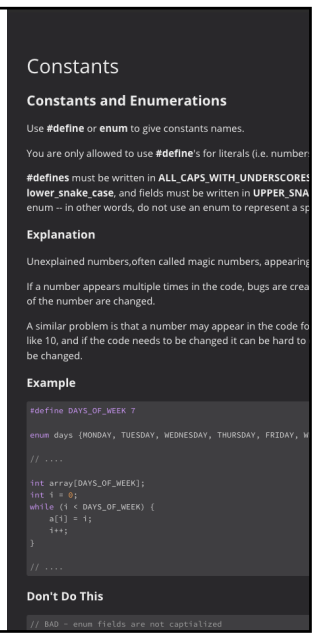
- I don't recommend many books
- This is a good one



1511 has a style guide

Follow the style guide (will be marked)

There is no *right* style guide, but you should follow it


Constants

Constants and Enumerations

Use **#define** or **enum** to give constants names.

You are only allowed to use **#define**'s for literals (i.e. number

#defines must be written in **ALL_CAPS_WITH_UNDERSCORES**
lower_snake_case, and fields must be written in **UPPER_SNA**
enum -- in other words, do not use an enum to represent a sp

Explanation

Unexplained numbers,often called magic numbers, appearing

If a number appears multiple times in the code, bugs are crea
of the number are changed.

A similar problem is that a number may appear in the code fo
like 10, and if the code needs to be changed it can be hard to
be changed.

Example

```c
#define DAYS_OF_WEEK 7

enum days {MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, W

// ....

int array[DAYS_OF_WEEK];
int i = 0;
while (i < DAYS_OF_WEEK) {
    a[i] = i;
    i++;
}

// ....
```

Don't Do This

```c
// BAD - enum fields are not captialized
```

Let's fix this up:

```
struct thingy {
    int x;
    double y;
};

int calcualte_result(struct thingy x, struct thingy y)
{
    if((x.x - y.y) > (y.x - x.y)) {
    return 0;
    } else if ((y.x - x.y) > (x.x - y.y)) {
        return 1
    } else {
        return -1;
    }
}

int main(void) {
    struct thingy x;
    x.x = 50;
    x.y = 5.0;

    y.x = 45;
    y.x = 2.5;

    calculate_result(x, y);
}
```

Command Line Arguments

So far...

- We can pass input into functions:

  `int cool_calculation(int x, int y)`

- `int x`, `int y` are the input, or arguments into the function

We can use the input to determine how the function runs

```
int cool_calculation(int x,
int y) {
    if (x > 0) {
        // do something when
x is positive
    } else {
        // do something if x
is negative
    }
}
```

How can we do this for entire programs?

Command Line Arguments

Command Line Arguments

- We can provide input via user input (`scanf`)
- Maybe we don't want the input to come from the user, or we already have the input
- We would like to be able to pass input to a program
- We can modify `main` to allow for CLI

before

```c
int main(void) {

}
```

after

```c
int main(int argc, char *argv[]) {
    //...
}
```

Quick demo

String to int

- Sometimes we want to read in numbers
- But all standard input is text-based
  - `6` is really `"6"`

Use the `atoi() function` to convert strings to integers

- Stands for ASCII to Integer

  Included in `stdlib.h`
- `atoi(const char *str)`
- `atol`, `atof` and `atoll` all exist (long, float, long long)

One more thing:

- Counting while loops is common :

```
int i = 0
while (i < SOME_NUM) { i++;
}
```

- So common, that a syntactical sugar exists that makes it a little easier

While loop

```
int i = 0
while (i < SOME_NUM) {
    ...
    i++;
}
```

For loop

```
for (int i = 0; i <
SOME_NUM; i++) {
    ...
}
```

Connect 4

Feedback