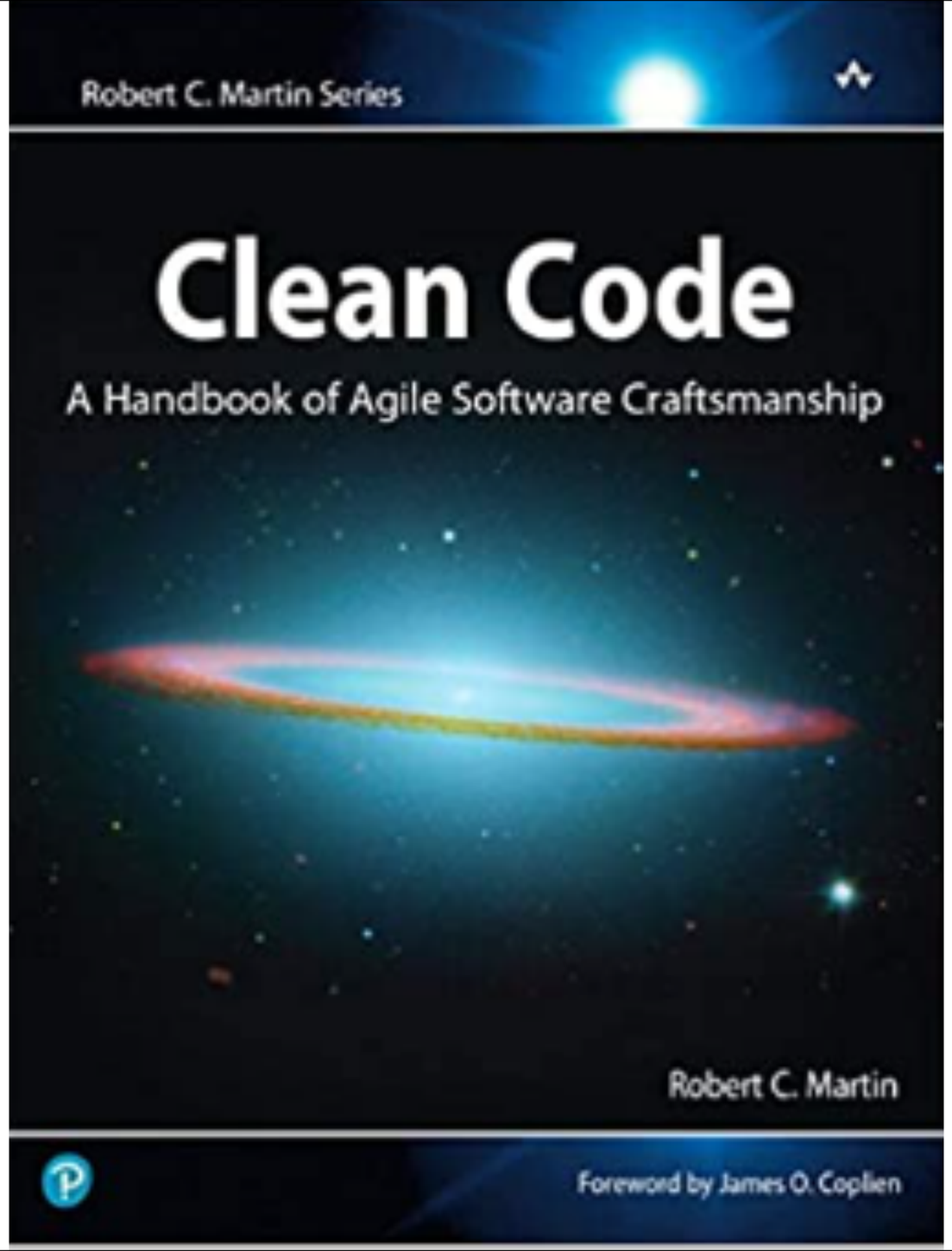
# Style

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. numbers, strings, characters) only.

**#defines** must be written in **ALL_CAPS_WITH_UNDERSCORES**. **enum** names must be wri
**lower_snake_case**, and fields must be written in **UPPER_SNAKE_CASE**. You should never
enum -- in other words, do not use an enum to represent a specific numerical value.

### Explanation

Unexplained numbers,often called magic numbers, appearing in code make it hard to un

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

A similar problem is that a number may appear in the code for multiple reasons, e.g. a co
like 10, and if the code needs to be changed it can be hard to determine which occurrenc
be changed.

### Example

```
#define DAYS_OF_WEEK 7

enum days {MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, WEEKEND};

// ....

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

// ....
```

### Don't Do This

```
// 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

```
int main(void) {


}
```

# after

```
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++) {
    ...
}
```

# More demo

# Feedback

https://forms.office.com/r/K3PjvWebtD