

Nicole Luong

Week 3

While loops, Structs, Enums, Variable Names

The background features several thick, hand-drawn teal lines. One line starts from the left edge, curves downwards, and then turns right towards the bottom right. Another line starts from the top left, goes right, then down, then right again, and finally down towards the bottom right. A third line starts from the top left, goes right, then down, then right again, and finally down towards the bottom right. These lines create a sense of movement and structure.

**Before we
begin**

Help Sessions

Lab check-ins

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While Loops

Hand execute

```
#include <stdio.h>

int main(void) {

    int count = 100;
    while (count < 500) {
        printf("%d\n", count);
        count += 100;
    }

    return 0;
}
```

While loops

Hand execute these loops

A

```
void a(void) {  
    int i = 5;  
    while (i > 0) {  
        printf("%d\n", i);  
        i--;  
    }  
}
```

B

```
void e() {  
    int i = 0;  
    int keep_going = 1;  
    while (keep_going == 1) {  
        if (i > 3) {  
            keep_going = 0;  
        }  
        i++;  
    }  
    printf("%d\n", i);  
}
```

E

```
void c(void) {  
    int i = 0;  
    while (i < 32) {  
        printf("%d\n", i);  
        i = i + 2;  
    }  
}
```

F

```
void g(void) {  
    int i = 0;  
    int max = 32;  
    while (i < max) {  
        printf("%d\n", i);  
        max = max + 2;  
    }  
}
```

C

```
void b(void) {  
    int i = 1;  
    while (i < 32) {  
        printf("%d\n", i);  
        i = i + i;  
    }  
}
```

D

```
void f(void) {  
    int i;  
    while (i > 0) {  
        printf("%d\n", i);  
        i--;  
    }  
}
```

G

```
void d(void) {  
    int i = 5;  
    while (i >= 0) {  
        printf("%d\n", i);  
        i--;  
    }  
}
```

H

```
void h() {  
    int i = 0;  
    int keep_going = 0;  
    while (keep_going == 1) {  
        if (i > 3) {  
            keep_going = 0;  
        }  
        i++;  
    }  
    printf("%d\n", i);  
}
```

2D While loops

Draw these 4 grids and fill out the patterns printed out by these loops


```
void a(void) {  
    int row = 0;  
    while (row < SIZE) {  
        int col = 0;  
        while (col < SIZE) {  
            if (row == col) {  
                printf("O");  
            } else {  
                printf("X");  
            }  
            col++;  
        }  
        row++;  
        printf("\n");  
    }  
}
```

```
void b(void) {  
    int row = 0;  
    while (row < SIZE) {  
        int col = 0;  
        while (col < SIZE) {  
            if (col % 2 == 0) {  
                printf("O");  
            } else {  
                printf("X");  
            }  
            col++;  
        }  
        row++;  
        printf("\n");  
    }  
}
```

```
void c(void) {  
    int row = 0;  
    while (row < SIZE) {  
        int col = 0;  
        while (col < SIZE) {  
            if (col != 1 && row != 1) {  
                printf("O");  
            } else {  
                printf("X");  
            }  
            col++;  
        }  
        row++;  
        printf("\n");  
    }  
}
```

```
void d(void) {  
    int row = 0;  
    while (row < SIZE) {  
        printf("X");  
        int col = 1;  
        while (col < 3) {  
            if (row == 0 || row == 3) {  
                printf("X");  
            } else {  
                printf("O");  
            }  
            col++;  
        }  
        printf("X");  
        row++;  
        printf("\n");  
    }  
}
```

Structs

User defined datatype that allows users to group together items of different types

Instead of this:

int rex_age

5

char rex_gender

M

double rex_weight

15.3

Do this:

```
struct dog {  
    int age;  
    char gender;  
    double weight;  
}
```

Why?

- Store related information in a single datatype rather than multiple
- Can return more information from functions

struct dog rex

int age

5

char gender

M

double weight

15.3

Enums

User defined datatype that allows users to assign names to predefined constants

Instead of this:

```
#define MONDAY 0
#define TUESDAY 1
#define WEDNESDAY 2
#define THURSDAY 3
#define FRIDAY 4
#define SATURDAY 5
#define SUNDAY 6
```

Do this:

```
enum weekdays {
    MONDAY,
    TUESDAY,
    WEDNESDAY,
    THURSDAY,
    FRIDAY,
    SATURDAY,
    SUNDAY
};
```

Why?

- The type conveys more information to the user
eg. int vs enum weekdays
- Assigns the constants for you

Variable Names

Legal Variable Names in C

- Contains letters, numbers, or _
- Must not start with a number

Good Style

- Start with lowercase
- Snake case eg. `good_example_variable_name`
- `#defines` names and enums must be in `SHOUTING_SNAKE_CASE`
- Descriptive and relevant to the program

A decorative graphic consisting of several thick, light pink lines that intersect and loop, creating a stylized, abstract pattern on the left side of the slide.

Lab Time!

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