

Week 3!

CLASS SEMESTER

Please take a minute to fill out the form
for last week if you haven't already 😊

Overview

While Loops

2D While Loops

Enums

Structs

Variable Names

While Loops

In groups hand execute your two assigned while loops

If you are struggling, it might help to write down what values each variable is and change them as you iterate

A

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

B

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

C

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

D

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

E

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

F

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

G

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

H

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

Let's compare our results with C

2D While Loops

Exactly the same as regular while loops

Nesting means the inner loop happens many times for each iteration of the outer loop

Group Activity! (Assume #define SIZE 4 for all of the examples in this activity)

A

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

B

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

C

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

D

```
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("0");  
            }  
            col++;  
        }  
        printf("\n");  
        row++;  
        printf("\n");  
    }  
}
```

Let's compare our results with C

Structs

Lets make custom data types with named fields

Very useful and worth understanding in depth

Code example...

Enums

Allow us to have a few specifically allowed values a variable can take

Manages the behind-the-scenes actual numerical values the enum takes

Variable Names

Legal Variable Names:

- Only contain letters, numbers or '_'
- Must not start with a number

Good Style Variable Names:

- Only start with a lower case letter
- Should always use snake_case
- #define-ed names must be in SHOUTING_SNAKE_CASE

Variable Names Activity

In groups:

- Write down 4 variable names or `#define` names
- Some of the names should be illegal, some should have bad style, some should have good style
- After finished we'll rotate and mark another group

GROUP

Group 1

name1
name3

NAME

name2
name4

Group 2

name1
name3

name2
name4

Group 3

name1
name3

name2
name4

Group 4

name1
name3

name2
name4



A large, semi-transparent circle with a gradient from dark purple at the top to bright cyan at the bottom overlaps the center of the slide. The text "Lab Time!" is centered within this circle in a bold, white, sans-serif font.

Lab Time!