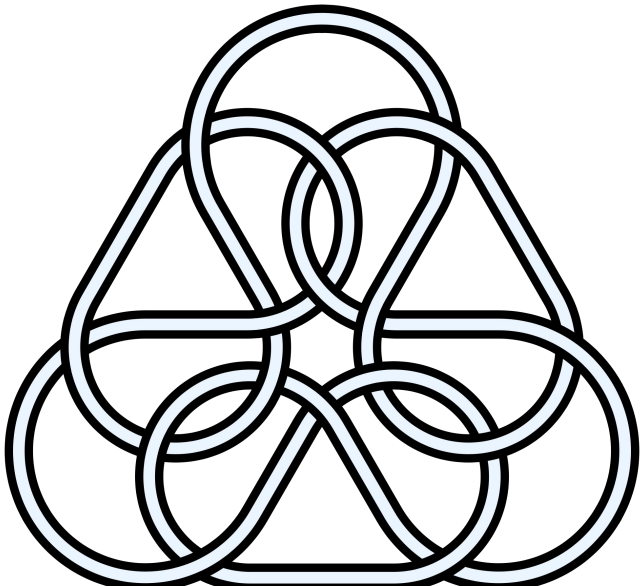
For Loops

While Loop Review

- Three main parts of a while loop
  - 1) Initialization
  - 2) Terminating Condition
  - 3) Update



Counter

- Three main parts of a loop
  - 1) **Initial condition**

```
int j= 0;
while (j < 10) {
   printf(“Skip Day Penalty\n”);
   j = j + 1;
}
```

Counter

- Three main parts of a loop
  - 2) **Terminating Condition**

```
int j= 0;
while (j < 10) {
   printf(“Skip Day Penalty\n”);
   j = j + 1;
}
```

Counter

- Three main parts of a loop
  - 3) **Update**

```
int j= 0;
while (j < 10) {
   printf(“Skip Day Penalty\n”);
   j = j + 1;
}
```

For Loops

- For Loops combine all three steps into one line of code

```
int i;
for (i = 0; i < 10; i++) {
    printf("Skip Day Penalty\n");
}
```

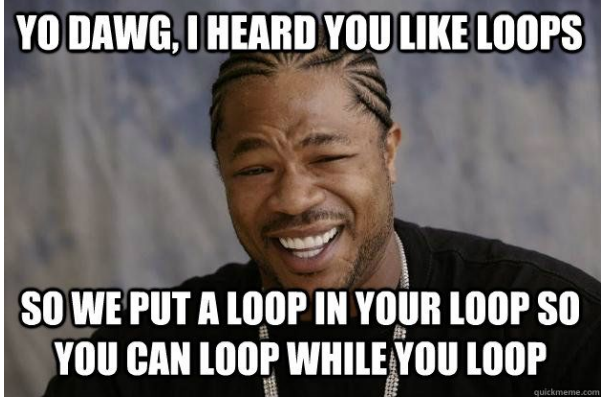
For Loops

- Mainly used for iterating over a *finite* set

```
int i;
for (i = 0; i < 10; i++) {
    printf("Skip Day Penalty\n");
}
```

For Loops

```
int i;
for (i = 0; i < 10; i++) {
    /*Code here*/
}
```

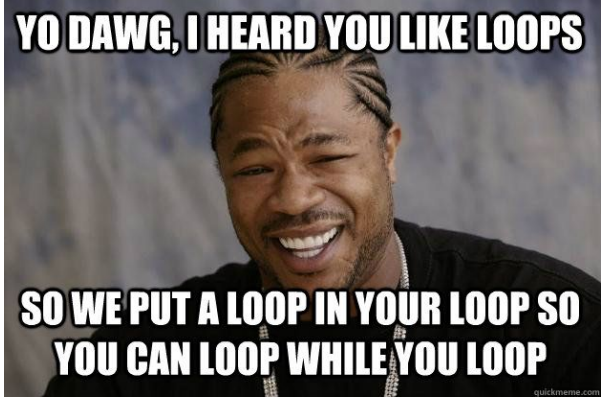


- A for loop still has all three parts of a loop

1) Initialization
   a) i = 0

For Loops

```
int i;
for (i = 0; i < 10; i++) {
    /*Code here*/
}
```

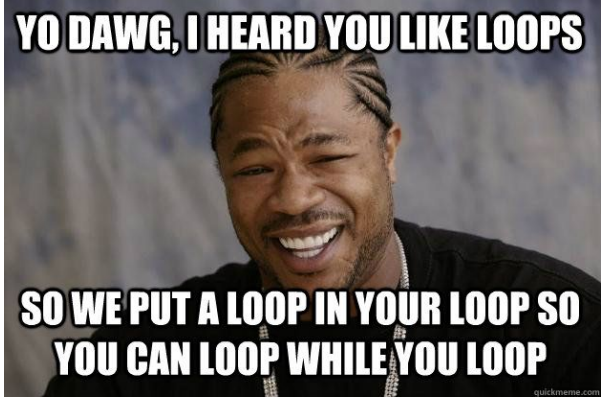


- A for loop still has all three parts of a loop

2) Update
   a) i++

For Loops

```
int i;
for (i = 0; i < 10; i++) {
    /*Code here*/
}
```

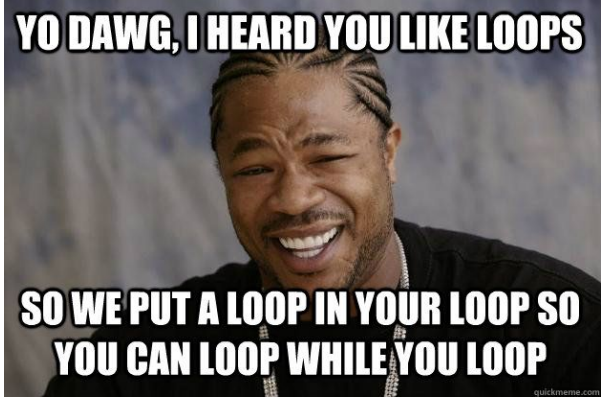


- A for loop still has all three parts of a loop

3) Termination
   a) i < 10

For Loops

```
int i;
for (i = 0; i < 10; i++) {
    /*Code here*/
}
```



- Final format

```
For (initialization; termination; update) {
   /*Code here*/
}
```

For Loop

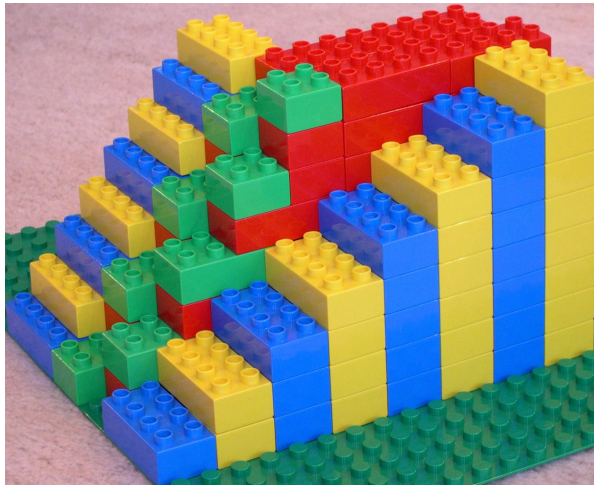
- Modify the box of *'s → use *for* loops instead of *while* loops

Combining Loops and If Statements

- Loops and if statements can be combined as many times as necessary

- Ex: mystery_while.c

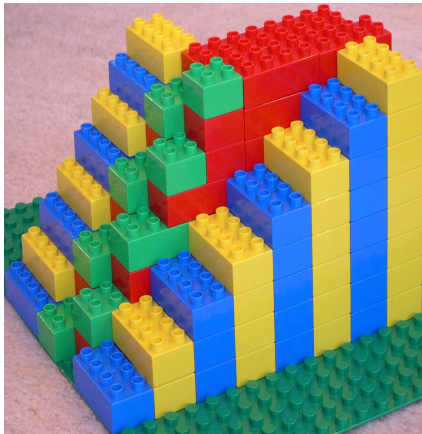
- What will this code print?
  - Task: write the output



Combining Loops and If Statements

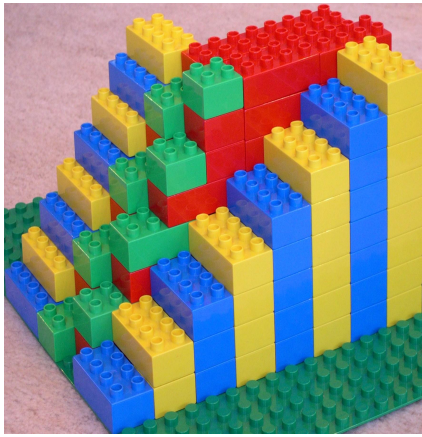
- Loops and if statements can be combined as many times as necessary

- For each while loop:
  - Find the initialization
  - Find the update
  - Find the terminating condition



Combining Loops and If Statements

- For loops combine all three into one step



- Ex: mystery_for.c

- What will this code print out?
- Where are the initalization / update / terminating steps?

Coding Challenge

Using for loops (and if statements), draw a triangle of a user-specified width and height to the screen. The triangle will look like the code example below. Submit this code to the “Illuminati” repository.

```
Enter a width: 5
Enter a height: 5
*
**
***
****
*****
```