CS 208
Mon, 3 April 2023
Triangular numbers:

\[ T(1) = 1 \]
\[ T(2) = 1 + 2 \]
\[ T(3) = 1 + 2 + 3 \]
E.g., "moose" at compile-time dynamically allocated memory (malloc and free). When you call a func, the stack grows; return, stack shrinks.
Mental models in Java

```java
int j = 23;
String s = "goat";
int k = j;
String t = s;
```
CS208: Build new mental models closer to actual hardware

char *s = malloc(20);

Dear OS. Please give me 20 bytes of my very own.

free(s);

← OS, you can have those 20 bytes back.
long k = 0xfeedface;
int j = 55;
char *s = "goat";
strlen(s) \rightarrow 4 \quad goa+

sizeof(s) \rightarrow 8

all pointers take 8 bytes (in C w/ Intel x86-64)

sizeof(j) \rightarrow 4 \quad (int+)

sizeof(k) \rightarrow 8 \quad (long)
char *get_copy(char *src) {
    check src == NULL
    char *copy = malloc(strlen(src) + 1) (at least)
    check copy == NULL
    return copy; copy the data
}
char *src

int n = strlen(src) + 1;

malloc(n * sizeof(char));

or

malloc(n * sizeof(*src))
f(char *src)

vs.

f(char src[])

main(int argc, char **argv[])

"array of char*'s"
typedef old_type new_type

typedef char * charptr

charptr s = "emu";