CS 208

Mon, 3 Apr. 2023

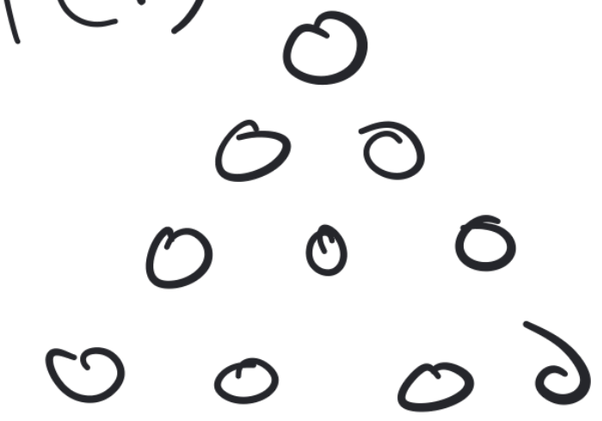
Triangular #s

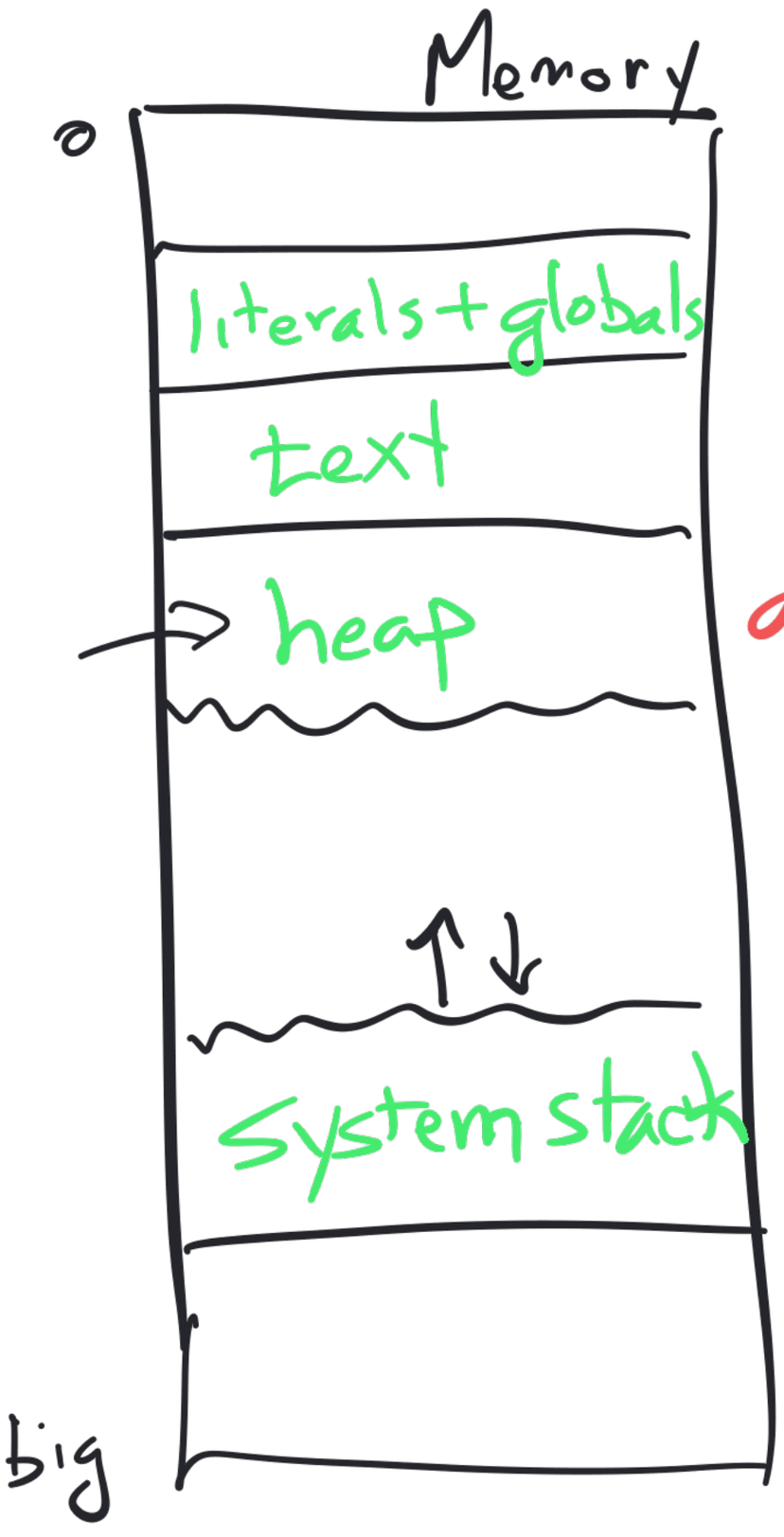
$T(1) = 1$

$T(2) = 1+2$

$T(3) = 1+2+3$

T(4)





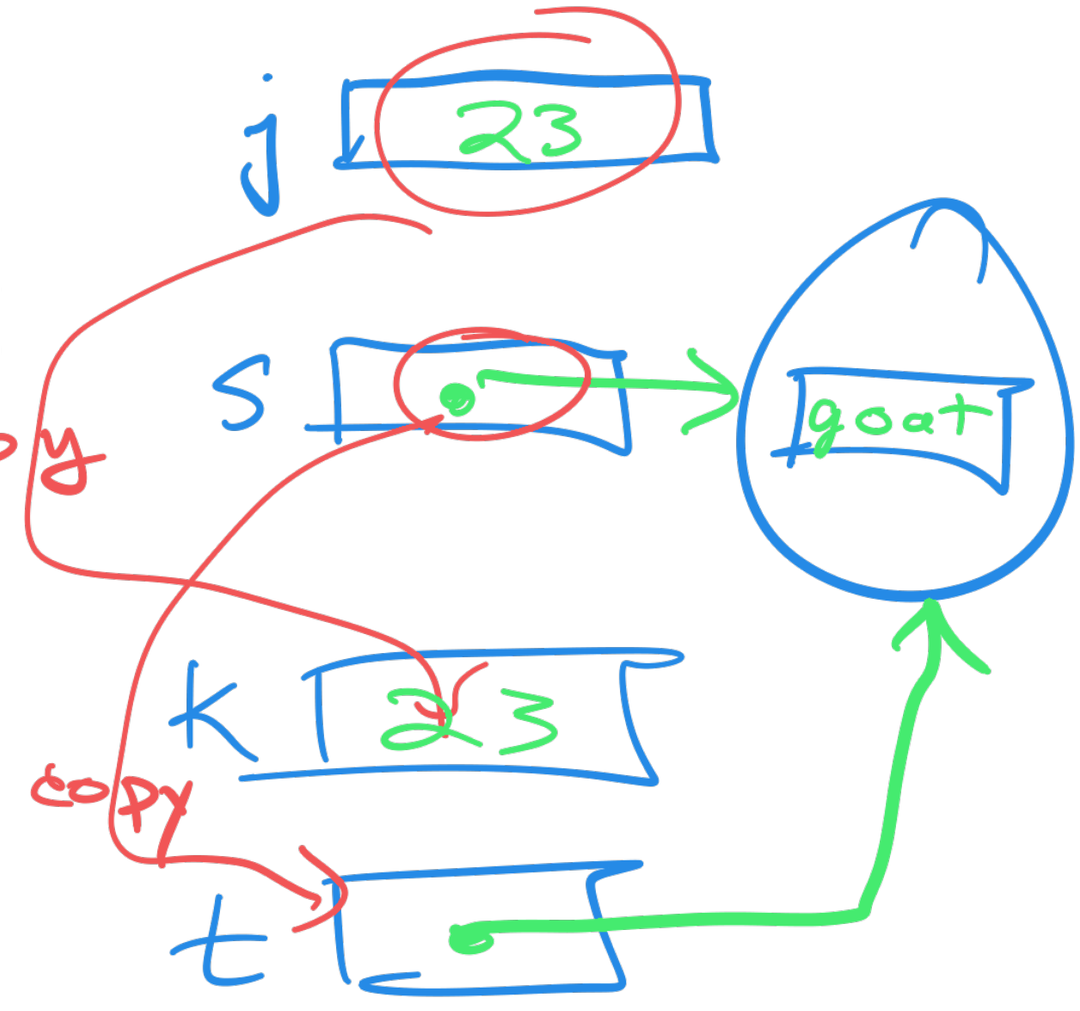
e.g. "Moose"
instructions
} known at compile-time

dynamically allocated memory (malloc & free)

when you call a fn. the stack grows; return, stack shrinks

Mental models in 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) → 4 g o a t

sizeof(s) → 8

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

sizeof(j) → 4 (int)

sizeof(k) → 8 (long)

```
char *get_copy(char *src){
  char *copy = malloc( ? );
  return copy;
}
```

check src == NULL

strlen(src) + 1 (at least)

check copy == NULL

copy the data

```
char *src
    int n = strlen(src) + 1;
malloc( n * sizeof(char));
```

or

```
malloc(n * sizeof(*src))
```

char

f(char *src)

vs.

f(char src[])

) the same

main(int argc, char *argv[])

"array of char*'s"

typedef old_type new_type

typedef char * charptr;

⋮

charptr s = "emu";