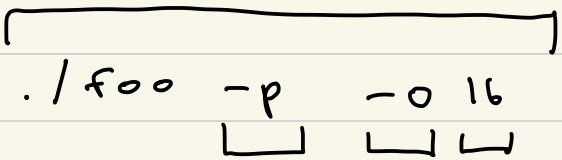
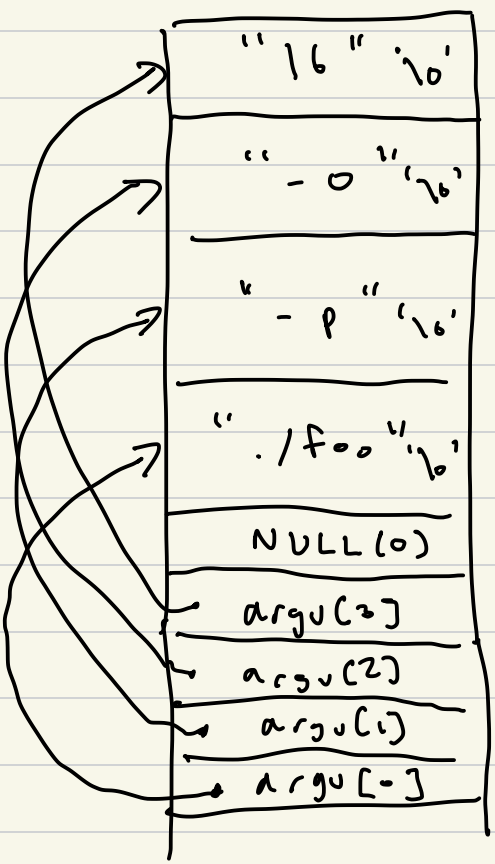
CS 315-01

Args
Numbers



4 args

```
int argc;
char *argv[];
```



echo repeat -r <count>

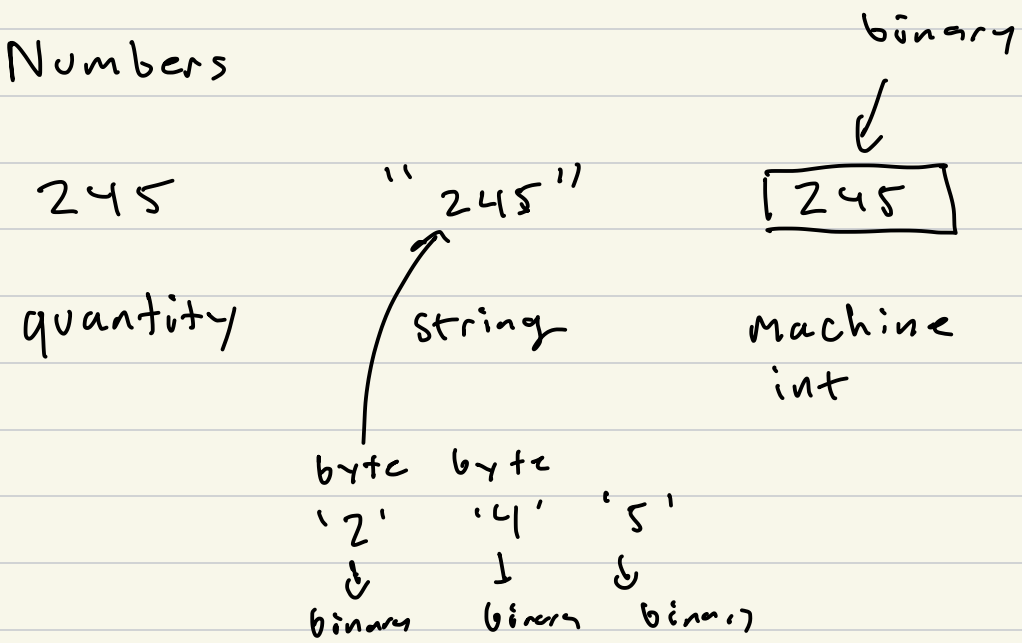
echo repeat -r 10 foo

echorepeat foo -r 10

foo -p 1 -r 2

foo -r 2 -p 1

Numbers



Decimal (base 10)

245

$$2 \times (10^2) + 4 \times (10^1) + 5 \times (10^0)$$
$$2 \times 100 + 4 \times 10 + 5 \times 0$$
$$200 + 40 + 5 = 245$$

Binary (base 2)

3 2 1 0

0b 1 1 0 1 → Dec 13

```
int x = 3
int x = 0b11
int x = 0x3
```

$$1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$
$$8 + 4 + 0 + 1 = 13$$

8 4 2 1

0b 1 1 0 1

msb ↑ ↑ lsb

least significant bit

most significant bit

4 bit binary value

n-bit binary number

2^n possible value

0 to $2^n - 1$

Dec	2 bits
0	00
1	01
2	10
3	11

4

Hexadecimal (base 16)

Decimal (10)	Binary (2)	Hex (16)
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

0x1AF

$1 \times 16^2 + \overset{10}{A} \times 16^1 + \overset{15}{F} \times 16^0$

$256 + 160 + 15 \times 1$

$= 431$

Project01

numstr → machine → numstr (base)
int

"245"

Char s = "245";

s[0] = '2'
s[1] = '4'
s[2] = '5'

ASCII to Dec
'0' = 48
'1' = 49
'2' = 50

int x = s[0];
x = ? 50

x = s[0] - 48
x = s[0] - '0';

```
int num;
```

```
num = (s[0]-'0')*100
    + (s[1]-'0')*10
    + (s[2]-'0')*1
```

num = 245

200
40
1

```
int intstr_to_int(char *s){
    int num = 0; int digit;
    int i = 0;
    while(s[i]!='\0'){
        num = num*10;
        digit = s[i]-'0';
        num = num + digit;
        i++;
    }
}
```

"245"
↑

num =>

"74123"
↑↑
s[0]

2
20
20+4
24
240
240+5
245

int to string

int x = 245; binary

int x = 245; base 10 ⇒ base 16

$245_{(10)} = 5$

d = x % (10) = (5)

x = x / (10) = 24

d = x % (10) = (4)

x = x / (10) = 2

d = x % (10) = (2)

x = x / (10) = 0

int x = 245;

d = x % 16 =