

CS 315-01 C Review

What you should be able to do

On Laptop

```
$ ssh beagle
```

USF Connect

USF Network

(1) No VPN - can ssh to stargate/beagle

(2) Need VPN

vpn1.usfca.edu

No Duo

vpn.usfca.edu

With Duo

GitHub with ssh on beagle

```
$ ssh -T git@github.com
```

Editing

micro

C Programming

Functions

Data - variables

- global
- Stack
- heap `malloc()`
`free()`

Statements and expressions

`x = 2;` assignment

`for()`

`while()`

`switch()`

Statements

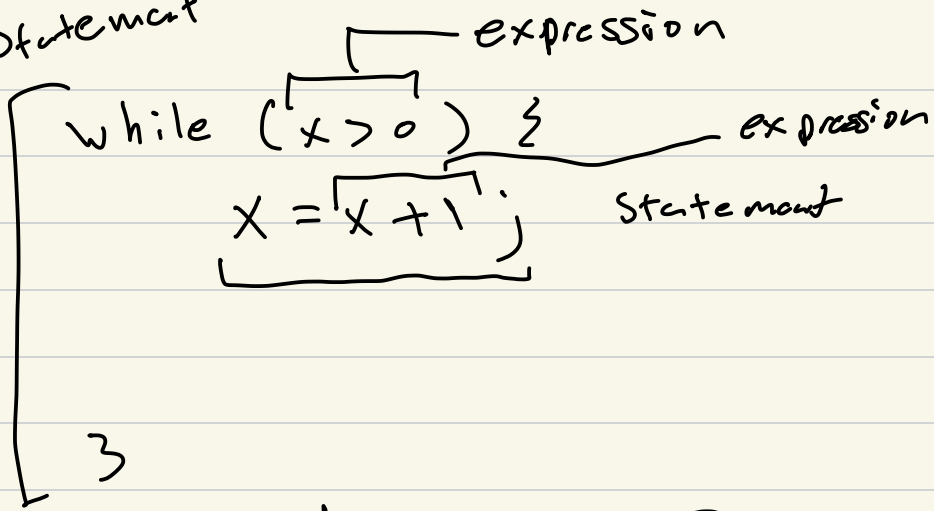
`1+2`

`x/4`

`foo(3)`

expressions

Statement



↓

```
for (i = 0; i < n; i++);
```

```
int add2 ( int a; int b ) {  
    return a + b;  
}
```

↓

```
x = add2 ( 1, 2 )
```

$y = 1;$

$x = (y++) + 1;$

$x = ?$ 2 not 3

$x = (++y) + 1;$

$y = y + 1 \quad \approx \quad y += 1;$

$x = y + 1$

`hello.c` \rightarrow `hello`

`gcc hello.c` \rightarrow `a.out`

`gcc -o hello hello.c`

hello.c



gcc



hello.o

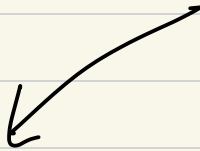


link



hello

libraries
printf



C Data and Data Types

primitive types

int, char, float, double
-2, -1, 0, 1, 2 'a' 2.31

unsigned int unsigned char

int \rightarrow 32 bits
16 bits

int32_t x;

int x;
int x = 3;
char c = 'a';

derived types

arrays

structs

int arr[10];

arr[0] = 3;

x = arr[2];

Strings (arrays)

```
char str[10];
```

```
str[0] = 'f';  
str[1] = 'o';  
str[2] = 'o';  
str[3] = '\0'
```

Strings
Null terminated

Struct

```
struct node_st {  
    int x;  
    int y;  
};
```

```
struct node_st node;
```

```
node.x = 9;  
node.y = 11;
```

Pointers

foo() {

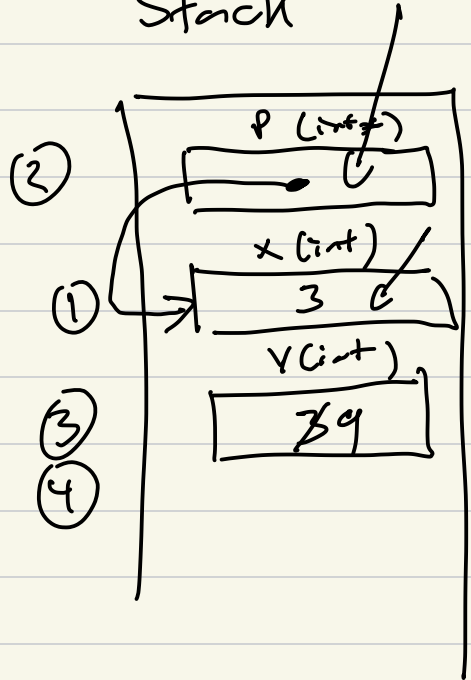
int *p;

int * p;

(1) int x = 3;

(2) p = &x;

Stack



pointers : two operators

* dereference
& address of

int y;

(3) y = *p;

(4) y = 9

$$p = 11;$$

$$\textcircled{5} \quad \underline{*p} = 11;$$