CS 315-02   C Review

What you should be able to do

On laptop

$ ssh beagle

USF Connect

(1) No VPN - can ssh to stargate/beagle
(2) Need VPN   Global Protect
    (a) vpn1.usfca.edu   No Duo
    (b) svpn.usfca.edu   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

$x = 2;$

```
if (x>0) {
    x += 1;
}
```

```
for ( ) {
}
```

```
while ( ) {
}
```

statements

$x = \boxed{(y + 1)}$ ← expression

statement

$\text{while } (\boxed{x < 5}) \ \{$
$\quad x = \boxed{x + 1};$
$\qquad \underbrace{}\ \text{expression}$
$\}$

test = $x > 0$;

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$\text{for } (\underline{i = 0}; \ i < n; \boxed{i{+}{+}}) \ \{$

$\}$

$x = {+}{+}x$ ← pre

$x = x{+}{+}$ post

$y = 1;$
$x = (y{+}{+}) + 1;$
$x = ? \ \boxed{2}$
$\qquad \quad 3$

$y = y + 1$ $y += 1;$
$x = y + 1$

functions   parameters

int add2 (int a, int b) {

    return a + b;

}

3

                              arguments

{ x = add2 (1, 2);
Statement   ↑ expressions

┌─────────┐   ┌─────────┐
│ hello.c │ →   │ hello   │
└─────────┘   └─────────┘

C Data and Data Types

primative types

int , char , float , double

-2,-1,0,1,2   'a'   2.34

unsigned int   unsigned char

int → 16 bits
int → 32 bits

int32_t x;

derived types

arrays
structs

int arr[10];
arr[0] = 3;
x = arr[5];

String is an array

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;
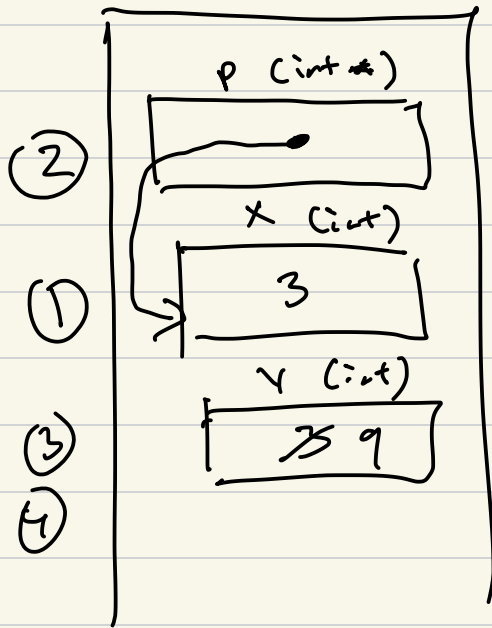};

struct node_st node;

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

Pointers

Stack

foo ()   {
    int *p;
    ___
    int* p;

① int x = 3
② p = &x;

② p (int *)
① x (int)
   3
③ y (int)
   ~~35~~ 9

pointer operators
    * dereference
    & address of

int y;

③ y = *p

④ y = 9

⑤ *p = 11;