

CS 161

Intro to CS I

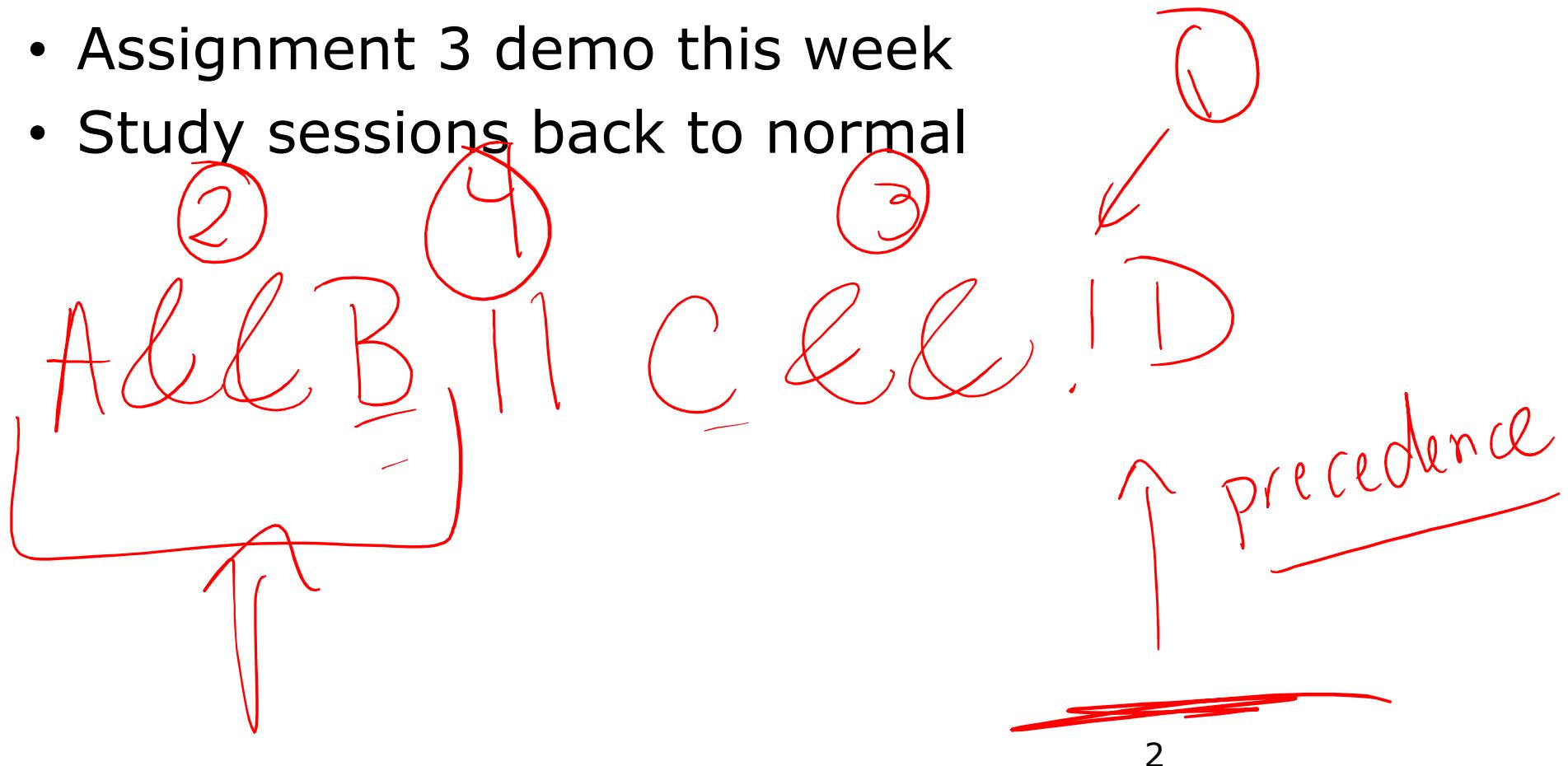
More Functions

Odds and Ends

- Assignment 3 demo this week
- Study sessions back to normal



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More About Functions



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- Do not use global variables!
- Function Headers
 - Description, Parameters, and Return Value
 - Preconditions
 - What is this?
 - Postconditions
 - What is this?

Pointers & refs

Parameters

no declared outside fun

Default Args



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```
access.engr.orst.edu - PuTTY
1 #include <iostream>
2
3 using std::cout;
4 using std::endl;
5
6 int pwr(int, int n=1); //Example of default args
7
8 int main() {
9     int base=2, expn=8;
10
11    cout << "The power function: " << pwr(base, expn) << endl;
12    cout << "The power function: " << pwr(base) << endl;
13
14    return 0; int x = base
15 }
16
17 int pwr(int x, int n=1) {
18     int num=1; n = 1
19
20     for(int i=0; i < n; i++) {
21         num*=x;
22     }
23
24     return num;
25 }
"test.cpp" 25L, 388C written
1,19
All
```

The code in the terminal window illustrates the use of default arguments in C++. The `pwr` function is defined with a second parameter `n` having a default value of 1. In the `main` function, two calls are made to `pwr`: one with both parameters specified and one where the second parameter is omitted, causing it to default to 1. Handwritten annotations in red highlight the `endl` directive, the call to `pwr(base)`, and the default value assignment `n = 1`.

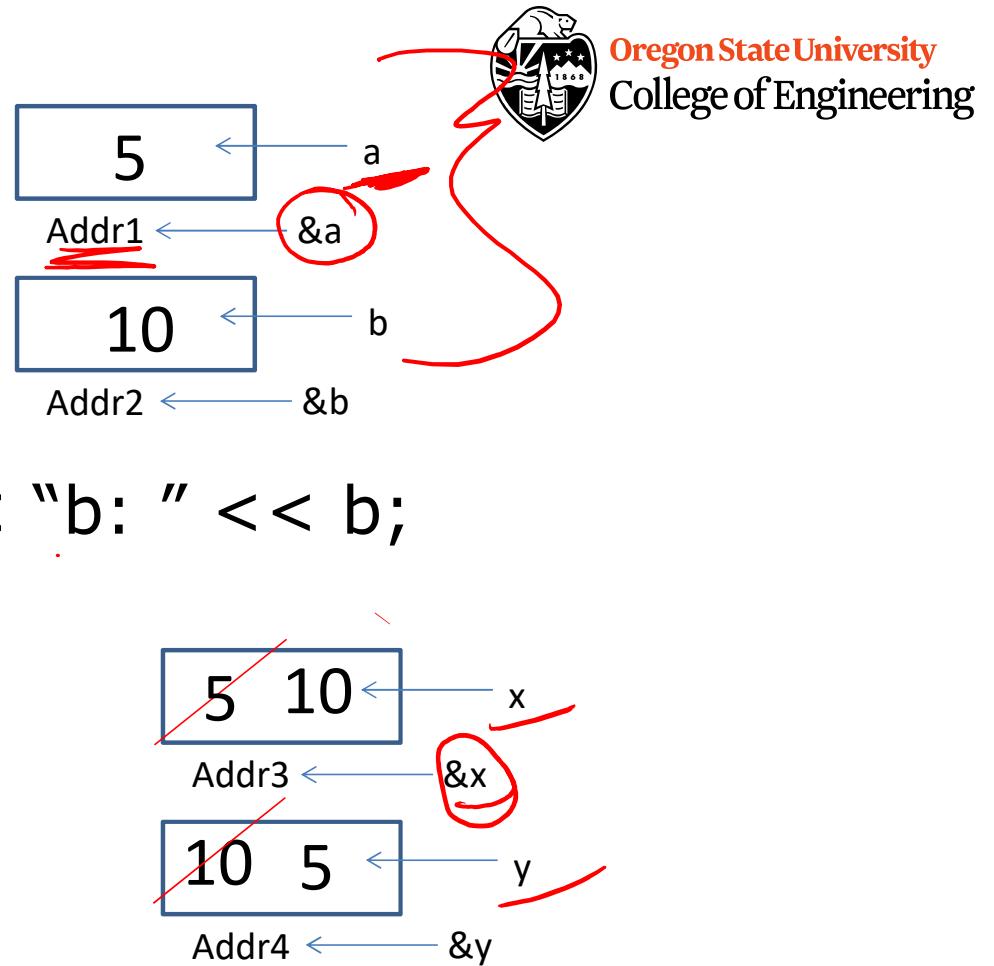
C++ Function Overloading



- Multiple functions w/ same name
- Arguments determine function
- Default Args can be done w/ overloading
- Example: pow()
 - <http://www.cplusplus.com/reference/cmath/pow/?kw=pow>

C++ Pass by Value

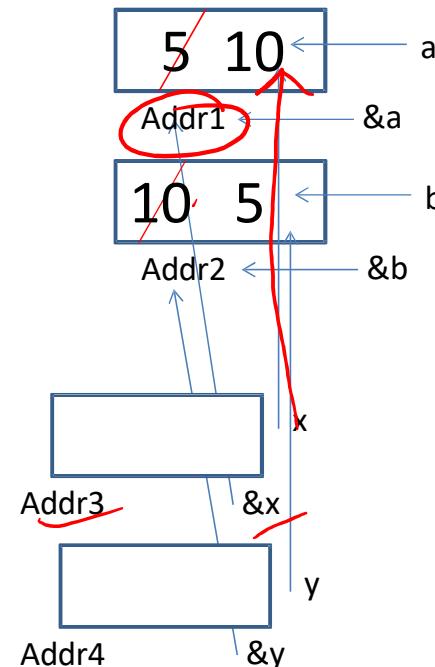
```
void swap(int, int);
int main() {
    int a=5, b=10;
    swap(a, b);
    cout << "a: " << a << "b: " << b;
}
void swap(int x, int y) {
    int temp = x;
    x = y;
    y = temp;
}
```



C++ Pass by Reference

```
void swap(int &, int &);
```

```
int main() {
    int a=5, b=10;
    swap(a, b);
    cout << "a: " << a << "b: " << b;
}
void swap(int &x, int &y) {
    int temp = x;
    x = y;
    y = temp;
}
```



int a=10;
int b=a;
b=5;

C/C++ Pointers

more powerful



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```
void swap(int *, int *);
```

```
int main() {
```

```
    int a=5, b=10;
```

```
    swap(&a, &b);
```

```
    cout << "a: " << a << "b: " << b;
```

```
}
```

```
void swap(int *x, int *y) {
```

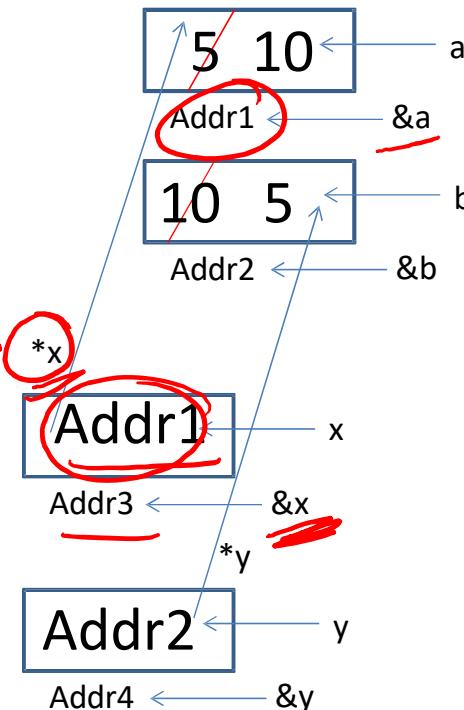
```
    int temp = *x;
```

```
    *x = *y;
```

```
    *y = temp;
```

```
}
```

hold an addr.



int a=10;

int *x;

x = &a;

cout << x;

*x = 5;