

FINAL REVIEW

Problem Solving with Computers-I

C++

```
#include <iostream>
using namespace std;

int main(){
    cout<<"Hola Facebook!";
    return 0;
}
```



Final Exam!

- Final exam page: <https://ucsb-cs16.github.io/f19/exam/e03/>
- Monday (12/9) noon to 3pm Embarcadero Hall
- Assigned seating, will be posted on Piazza
- Everything we have covered so far is on the exam
- Duration: **3 hours**
- **Closed book: no calculators, no phones, no computers**
- Only 1 sheet (***double***-sided is ok) of written notes
 - Must be no bigger than 8.5" x 11"
 - You have to turn it in with the exam

Review

- Coding practice (recursion + linked lists)
- Pointers
- Structs and Linked List

Take notes!

Recursion and linked list

- Given a linked list, implement each of the following:
 - Find the min value in the linked list
 - Delete all the nodes in the linked list
 - Delete the value of a single node in a linked list

See code written in lecture

Pointers

1. What C++ unary operator is the "de-referencing" operator? *

2. What C++ unary operator is the "address-of" operator? &

3. Declare a variable p to be a pointer to a pointer to a character

`char** p;` // p is 4 bytes

4. Draw a pointer diagram to show the evolution of data in memory during the execution of the following code:

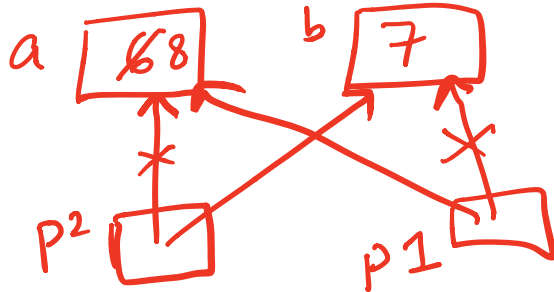
A.

```
int a=6, b=7, *p1=&b, *p2=&a;
```

```
p1 = p2;
```

```
*p1 = 8;
```

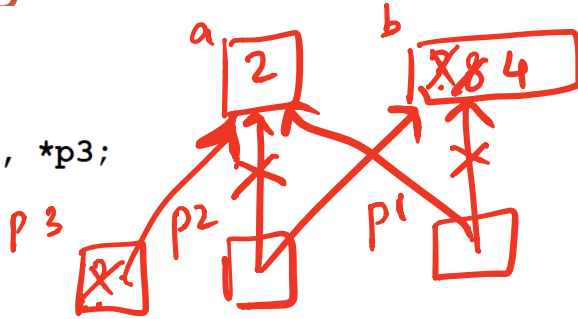
```
p2 = &b;
```



Draw pointer diagrams

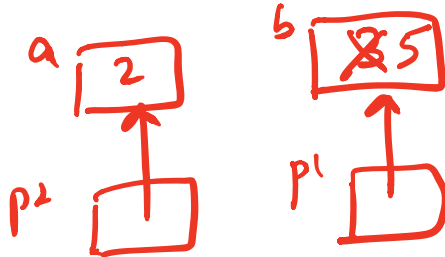
B.

```
int a=2, b, *p1=&b, *p2=&a, *p3;  
p3 = p2;  
*p1 = 8;  
p2 = p1;  
p1 = p3;  
*p2 = 4;
```



C.

```
int a=2, b=3, *p1, *p2;  
p2 = &a;  
p1 = &b;  
*p1 = *p1 + *p2;
```



Draw pointer diagrams for the following code

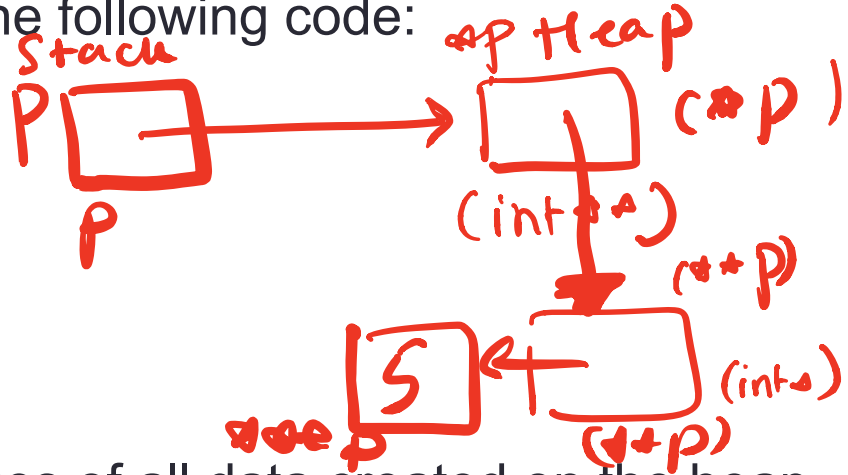
(a) Draw a pointer diagram for the following code:

```
int*** p = new int**;
```

```
*p = new int*;
```

```
**p = new int;
```

```
***p = 5;
```

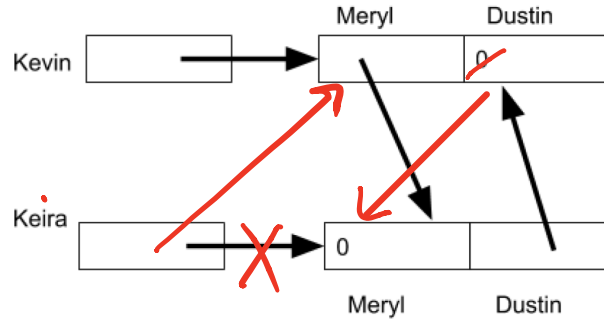


(b) Write code to print the values of all data created on the heap

Pointers and Structs

i

```
struct Actors{
    Actors* Meryl;
    Actors* Dustin;
};
Actors* Kevin;
Actors* Keira;
```



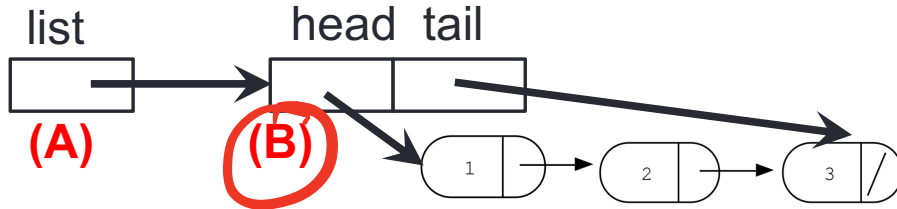
Starting with the current state of memory shown above, consider the C++ code shown below. In the space to the right, draw the state of memory after this code executes?

```
Kevin->Meryl = 0;
Kevin->Dustin = Keira;
Keira = Keira->Dustin;
```


Deleting the list

```
int freeLinkedList(LinkedList * list){...}
```

Which data objects are deleted by the statement: `delete list;`



(C) All nodes of the linked list

(D) B and C

(E) All of the above

Does this result in a memory leak?

Some comic relief...

	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

Some comic relief



Good luck with the final!