

Exercise 1

Use a box-and-arrow diagram for the following program to explain what it prints out:

```
#include <stdio.h>

int foo(int *bar, int **baz) {
    *bar = 5;
    *(bar+1) = 6;
    *baz = bar+2;
    return *((*baz)+1);
}

int main(int argc, char **argv) {
    int arr[4] = {1, 2, 3, 4};
    int *ptr;

    arr[0] = foo(&(arr[0]), &ptr);
    printf("%d %d %d %d %d\n",
           arr[0], arr[1], arr[2], arr[3], *ptr);
    return 0;
}
```

main

```
#include <stdio.h>

int foo(int *bar, int **baz) {
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→ int main(int argc, char **argv) {
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    printf("%d %d %d %d %d\n",
           arr[0], arr[1], arr[2], arr[3], *ptr);
    return 0;
}
```

ptr	???
-----	-----

arr[0]	???
--------	-----

arr[1]	???
--------	-----

arr[2]	???
--------	-----

arr[3]	???
--------	-----

main

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```

ptr	???
-----	-----

arr[0]	1
--------	---

arr[1]	2
--------	---

arr[2]	3
--------	---

arr[3]	4
--------	---

main

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ptr	???
-----	-----

arr[0]	1
--------	---

arr[1]	2
--------	---

arr[2]	3
--------	---

arr[3]	4
--------	---

main

```
#include <stdio.h>

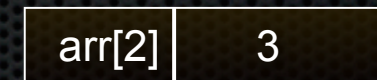
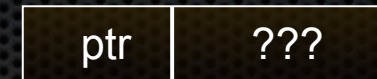
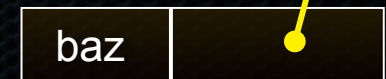
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}
```



foo



main

```
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}
```

ptr	???
-----	-----

arr[0]	5
--------	---

arr[1]	2
--------	---

arr[2]	3
--------	---

arr[3]	4
--------	---

bar	
-----	--

baz	
-----	--

foo

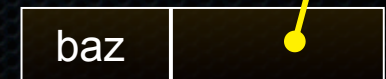
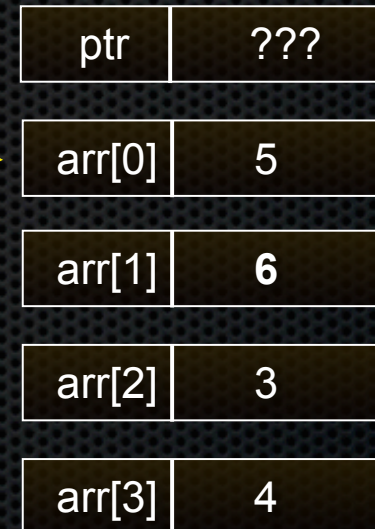
main

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}
```



foo

main

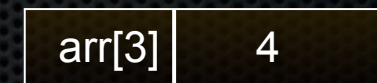
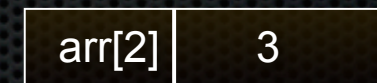
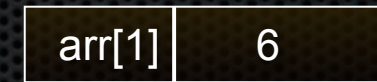
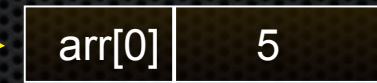
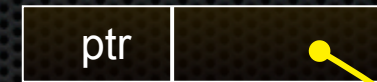
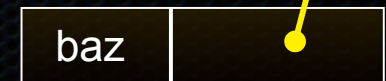
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foo



main

```
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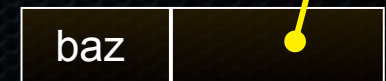
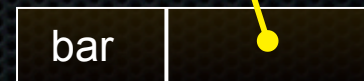
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    int *ptr;

    arr[0] = foo(&(arr[0]), &ptr);
    printf("%d %d %d %d %d\n",
           arr[0], arr[1], arr[2], arr[3], *ptr);
    return 0;
}
```



**baz = pointer to arr[2]*

foo



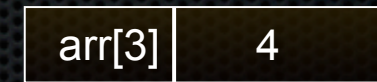
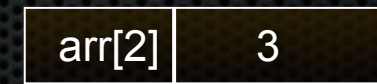
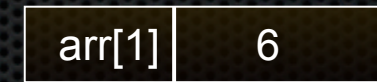
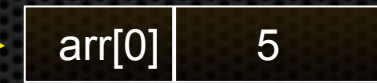
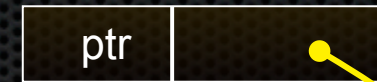
main

```
#include <stdio.h>

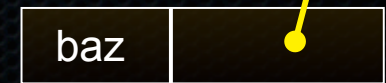
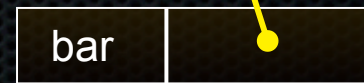
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int main(int argc, char **argv) {
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    printf("%d %d %d %d %d\n",
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    return 0;
}
```



*(*baz)+1 = pointer to arr[3]*



foo

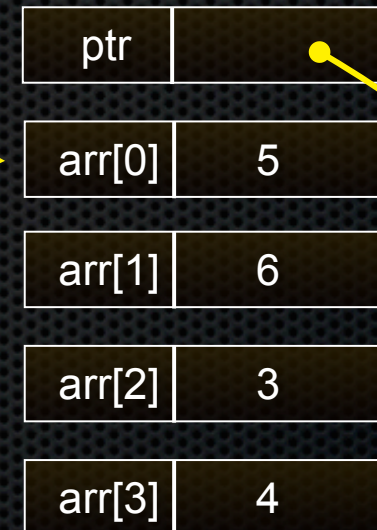
main

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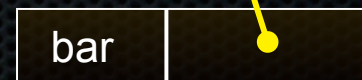
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```



$*((*baz)+1) = 4$

foo



main

```
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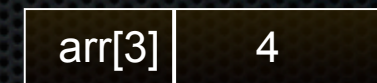
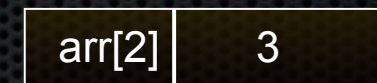
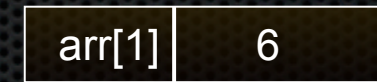
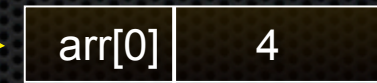
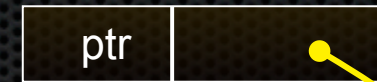
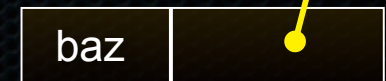
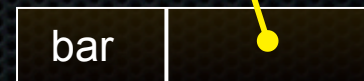
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foo



main

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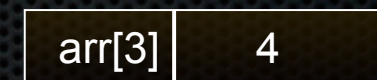
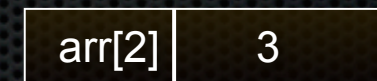
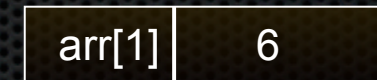
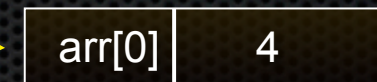
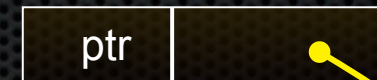
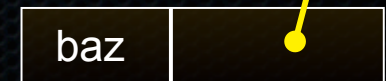
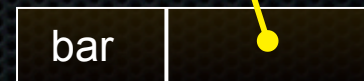
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foo



prints: 4 6 3 4 3