CmpE 150 - Week 8

Section - 04

6th quiz today

- Start: 12:00
- End: 12:20
- Be careful! **Do not** write extra things other than required, otherwise automatic grading **does not** give your points!
- No cell phones, no personal computers!

Pointers

- Pointers are variables whose values are *memory addresses*.
- Normally, a variable directly contains a specific value.
- A pointer, on the other hand, contains an *address* of a variable that contains a specific value.

Important operators with pointers

- & operator: Gives the address of the operand
- * operator: Can be applied to pointers. Used for accessing the variable inside the pointer.

MA	val	var
3212		
3216		
3220		
3224		
3228		
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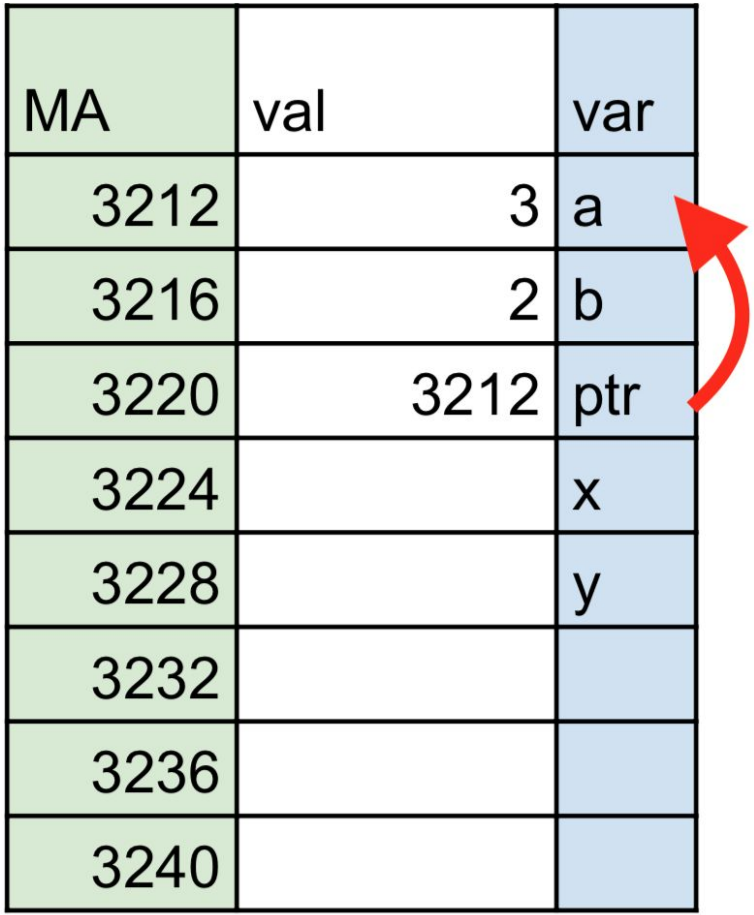
3236		
3240		

MA	val	var
3212	3	a
3216	2	b
3220		ptr
3224		x
3228		y
3232		
3236		
3240		


MA
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var
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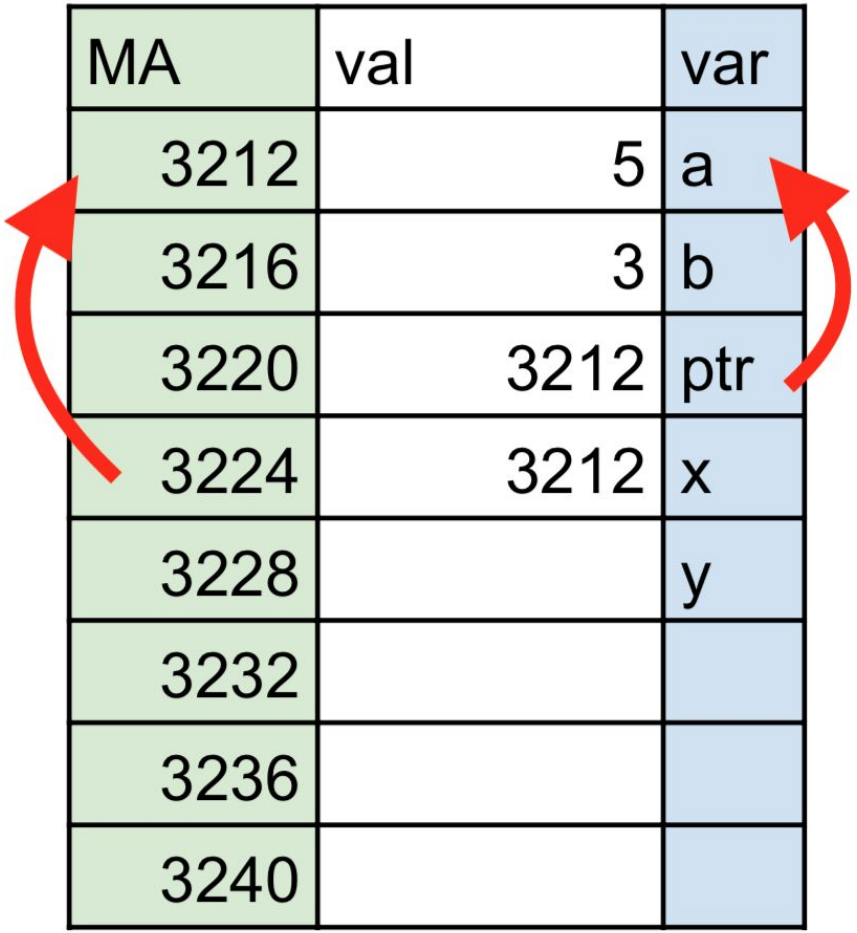
MA	val	var
3212	3	a
3216	3	b
3220	3212	ptr
3224		x
3228		y
3232		
3236		
3240		

MA	val	var
3212	3	a
3216	3	b
3220	3212	ptr
3224		x
3228		y
3232		
3236		
3240		

MA	val	var
3212	5	a
3216	3	b
3220	3212	ptr
3224		x
3228		y
3232		
3236		
3240		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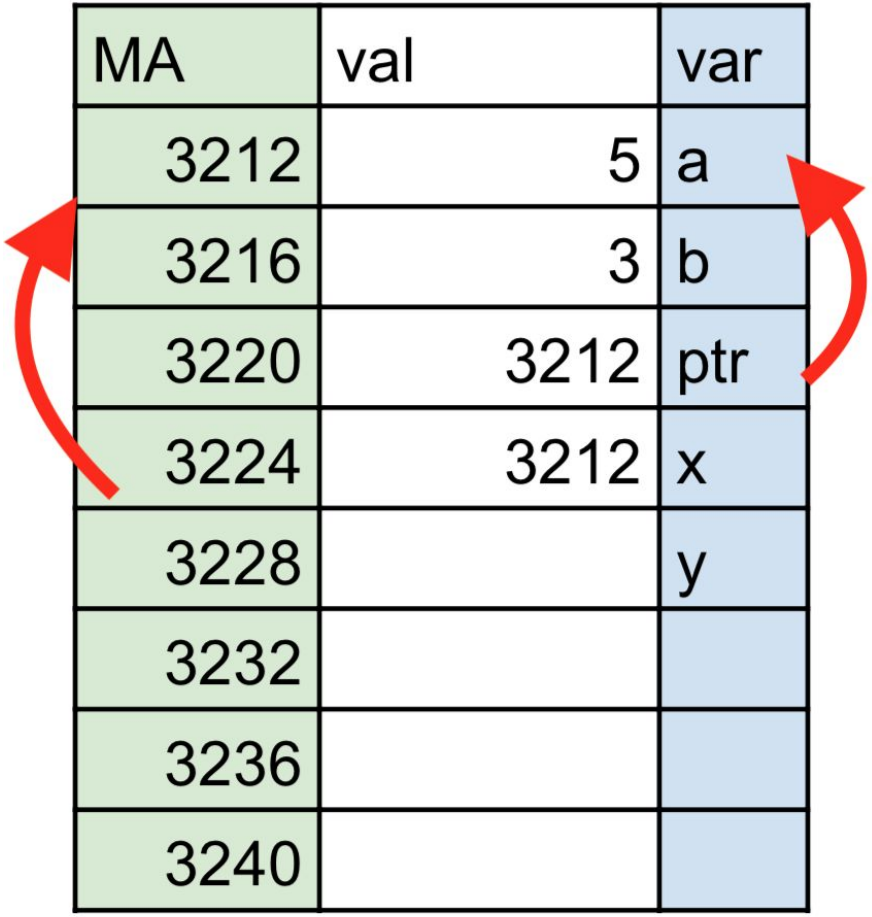
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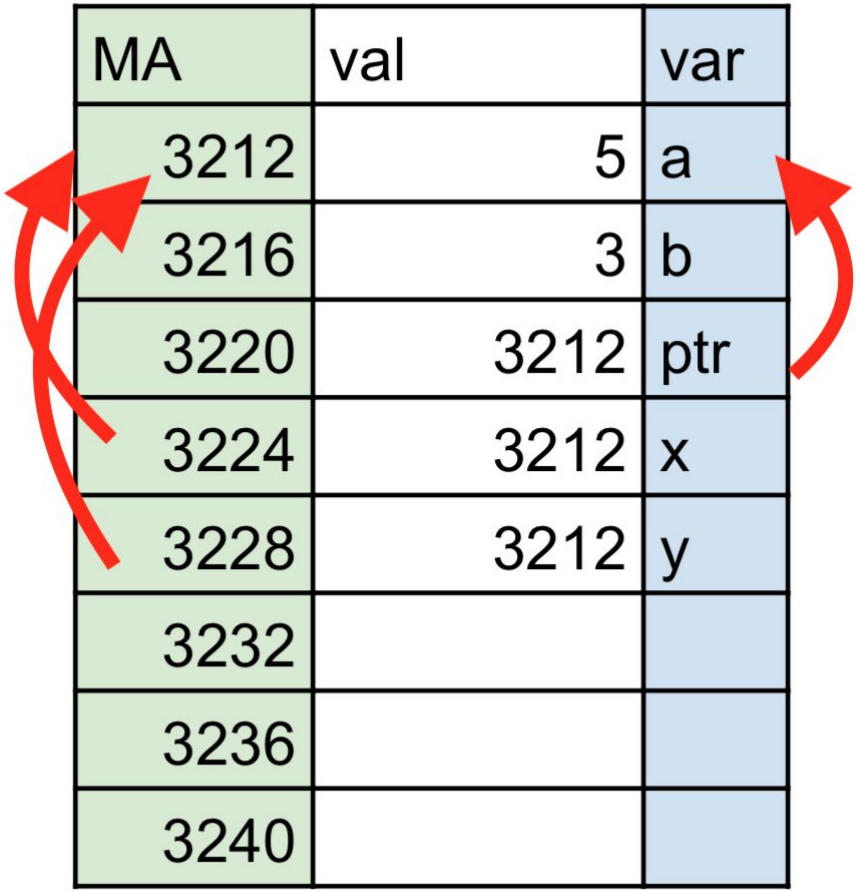
MA
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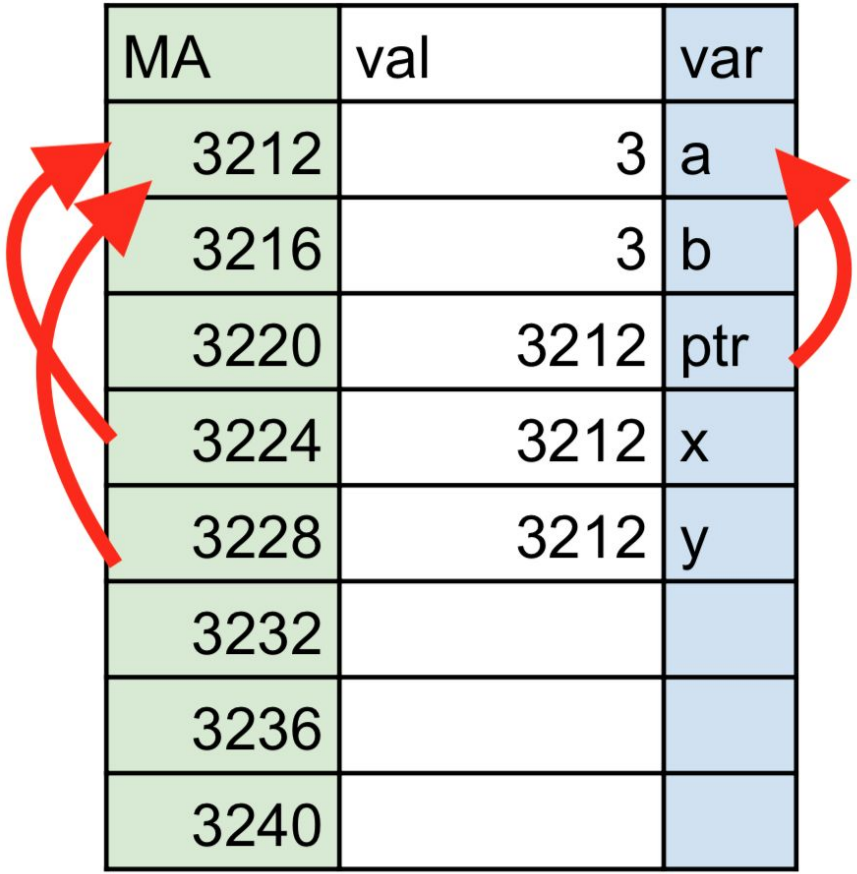
MA
val
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3212
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a
3216
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b
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3212
ptr
3224
3212
x
3228
3212
y
3232
3236
3240

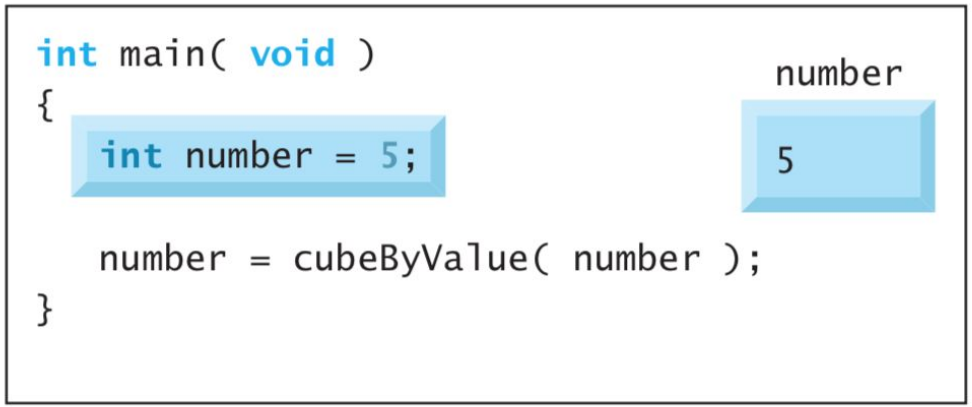
Call by Reference

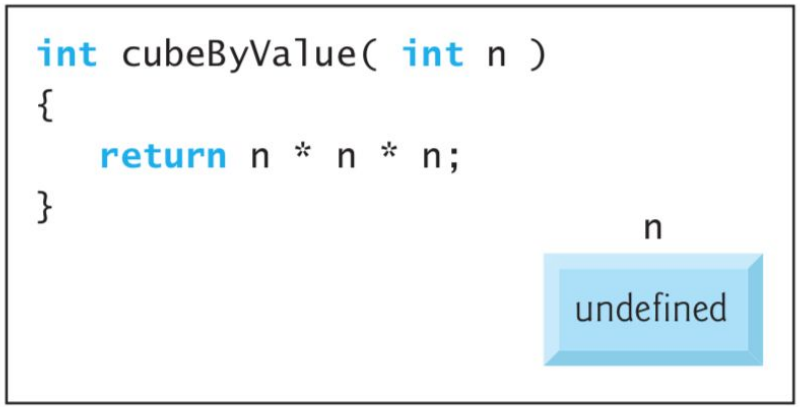
```
int main(){

    int num;

    scanf(“%d”,&num);

}
```

- We have already seen an example of call by reference.
- When you call a function, a frame for the function in the stack is created
- After the return statement within the function, this frame is erased

Call by Value

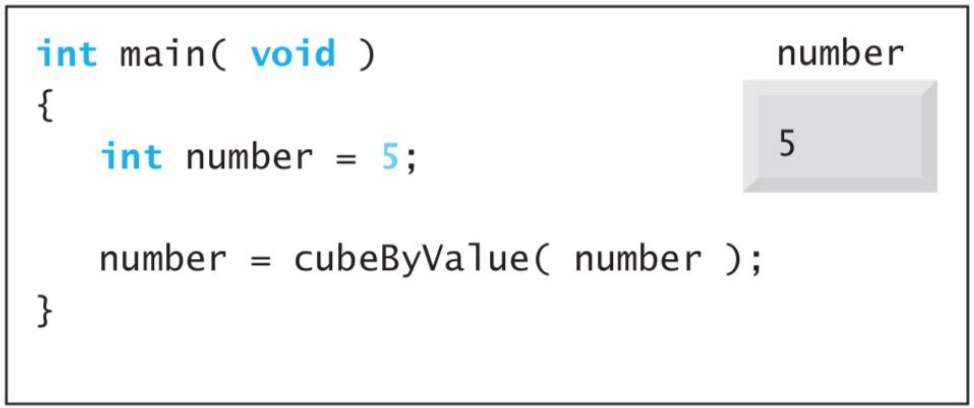
Step 1: Before `main` calls `cubeByValue`:

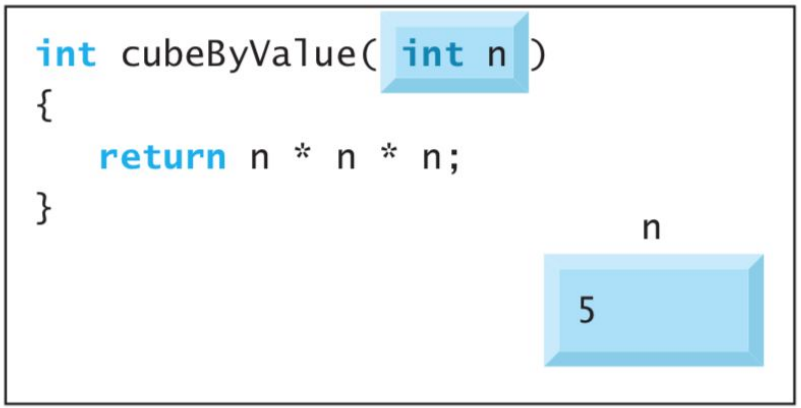




Src: Deitel C How to Program

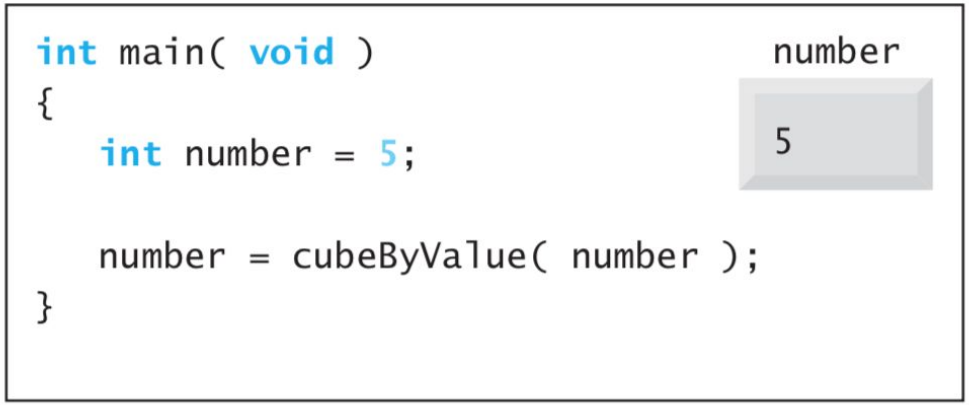
Step 2: After `cubeByValue` receives the call:

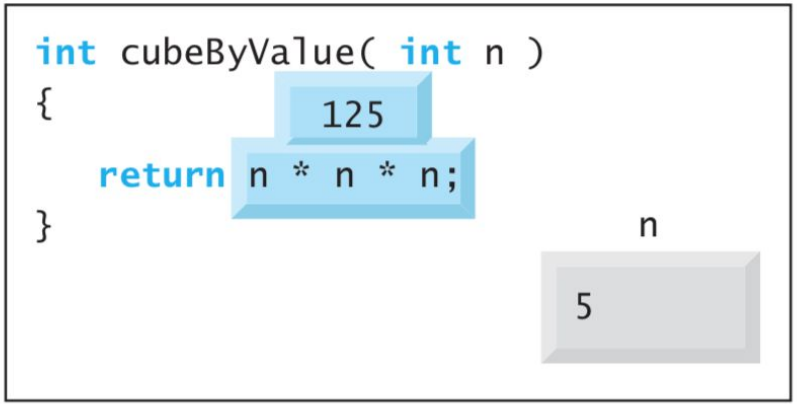




Src: Deitel C How to Program

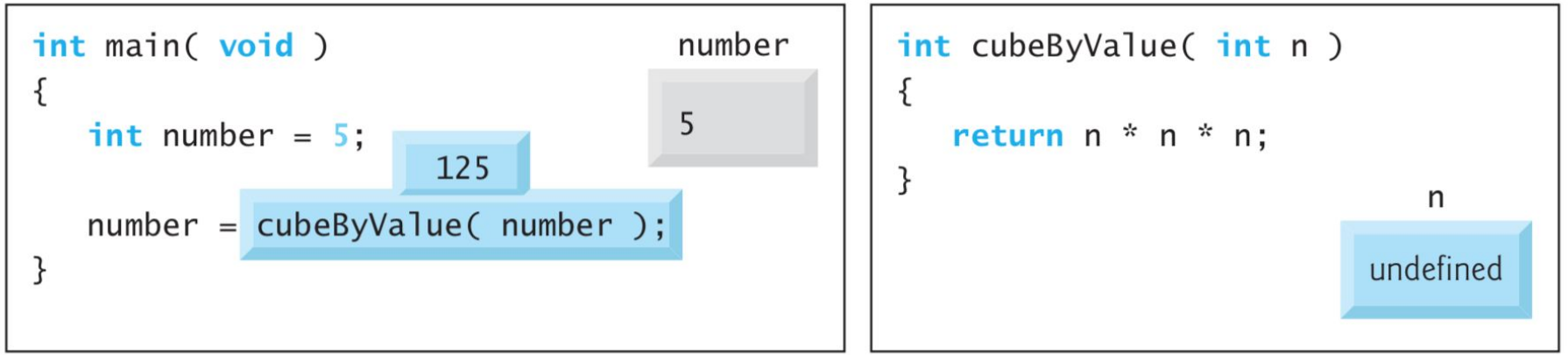
Step 3: After `cubeByValue` cubes parameter `n` and before `cubeByValue` returns to `main`:





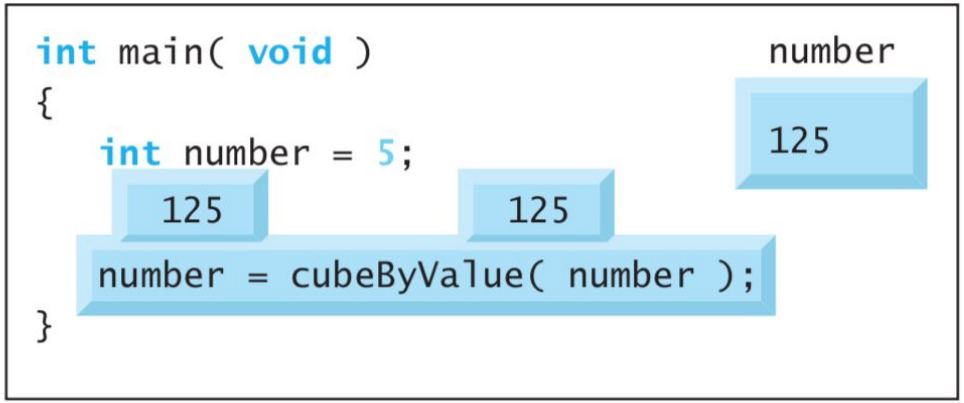
Src: Deitel C How to Program

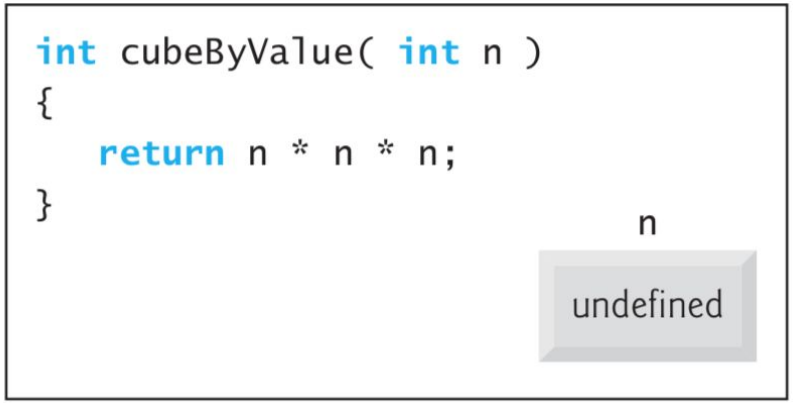
Step 4: After `cubeByValue` returns to `main` and before assigning the result to `number`:



Src: Deitel C How to Program

Step 5: After `main` completes the assignment to `number`:

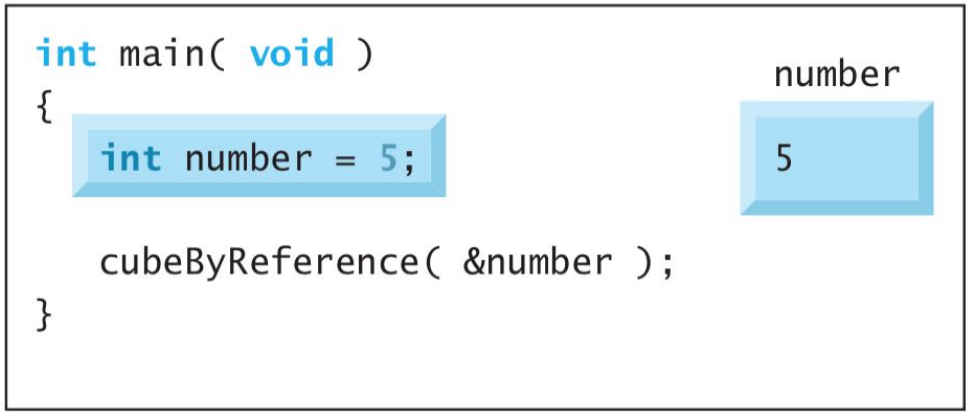


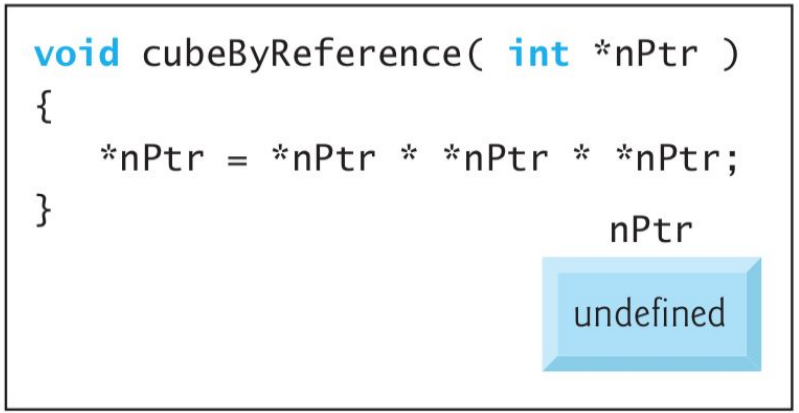


Src: Deitel C How to Program

Call by Reference

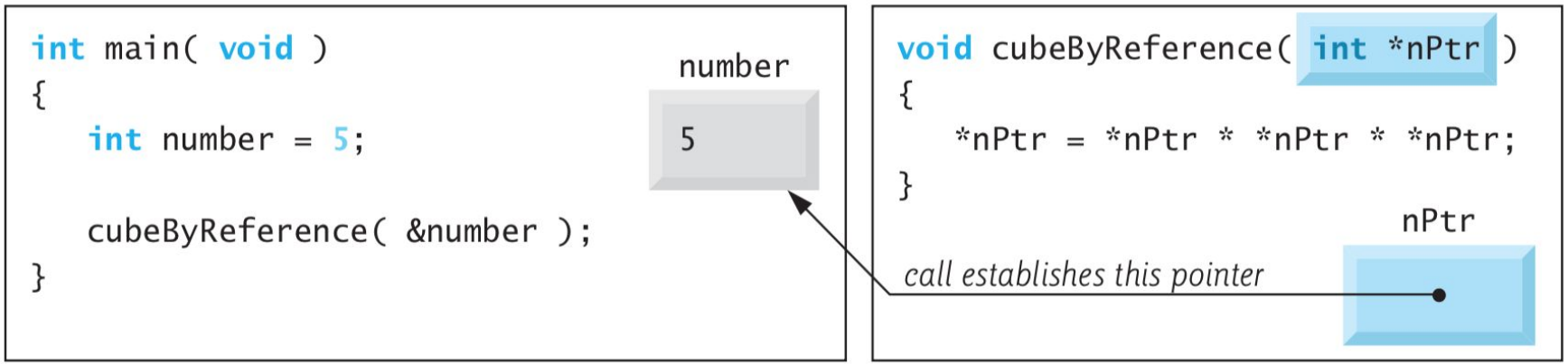
Step 1: Before `main` calls `cubeByReference`:





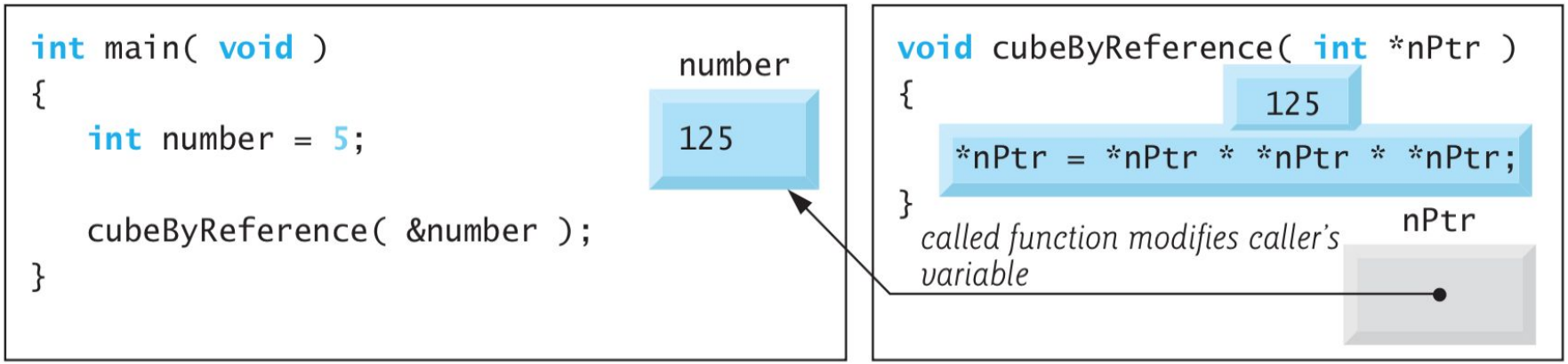
Src: Deitel C How to Program

Step 2: After `cubeByReference` receives the call and before `*nPtr` is cubed:



Src: Deitel C How to Program

Step 3: After *nPtr is cubed and before program control returns to main:



Src: Deitel C How to Program