

Stack Diagram Practice

(find and work with a partner)

1. Given the code below, draw the stack diagram as it would look right *before* line 5 is executed (so `main` is in the process of executing line 10 and `add` has just finished the for loop). Make sure to include all *values* on the *heap* and all *functions* (with the *variables* in their *scope*) on the *stack*.

```
1 def add(lst, x):
2     n = len(lst)
3     for i in range(n):
4         lst[i] = lst[i] + x
5     print("done adding!")
6
7 def main():
8     data = [7, 10, 4]
9     z = 2
10    add(data, z)
11    print(data)
12
13 main()
```

2. After this program has finished, what is `data` equal to?

Steps for drawing stack diagrams:

- draw empty stack/heap
- put first function called on stack (usually `main`)
 - set up any parameters for this stack frame (assign to values on the heap)
 - execute function, step by step, setting up any local variables as you go
 - send return value (if any) back to calling function
 - remove finished function from stack (erase or cross out)
- continue executing the function that is now on top of stack
- note: be able to include and increment line numbers associated with the functions on the stack