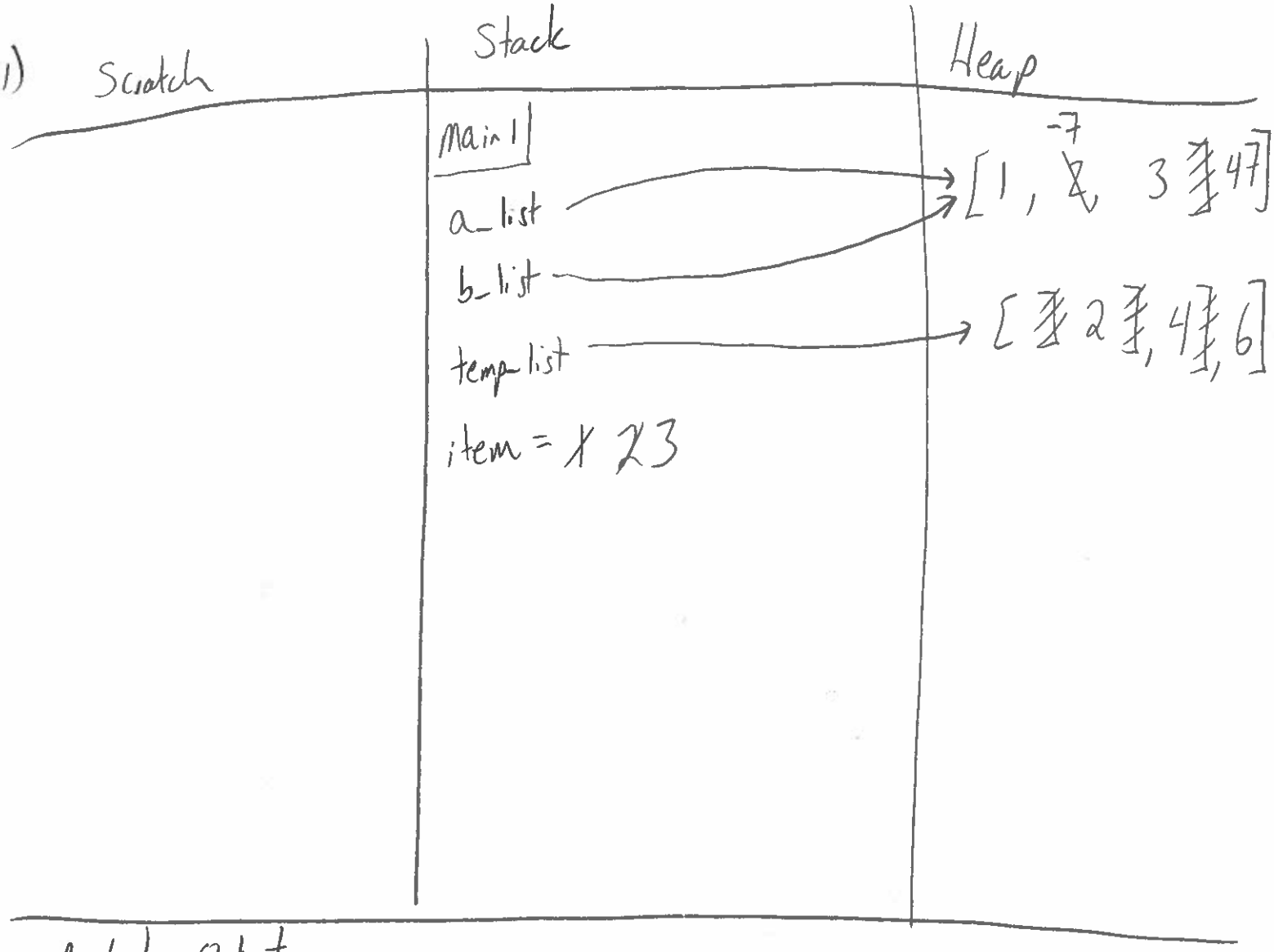
Tracing with the Heap

1) Scratch

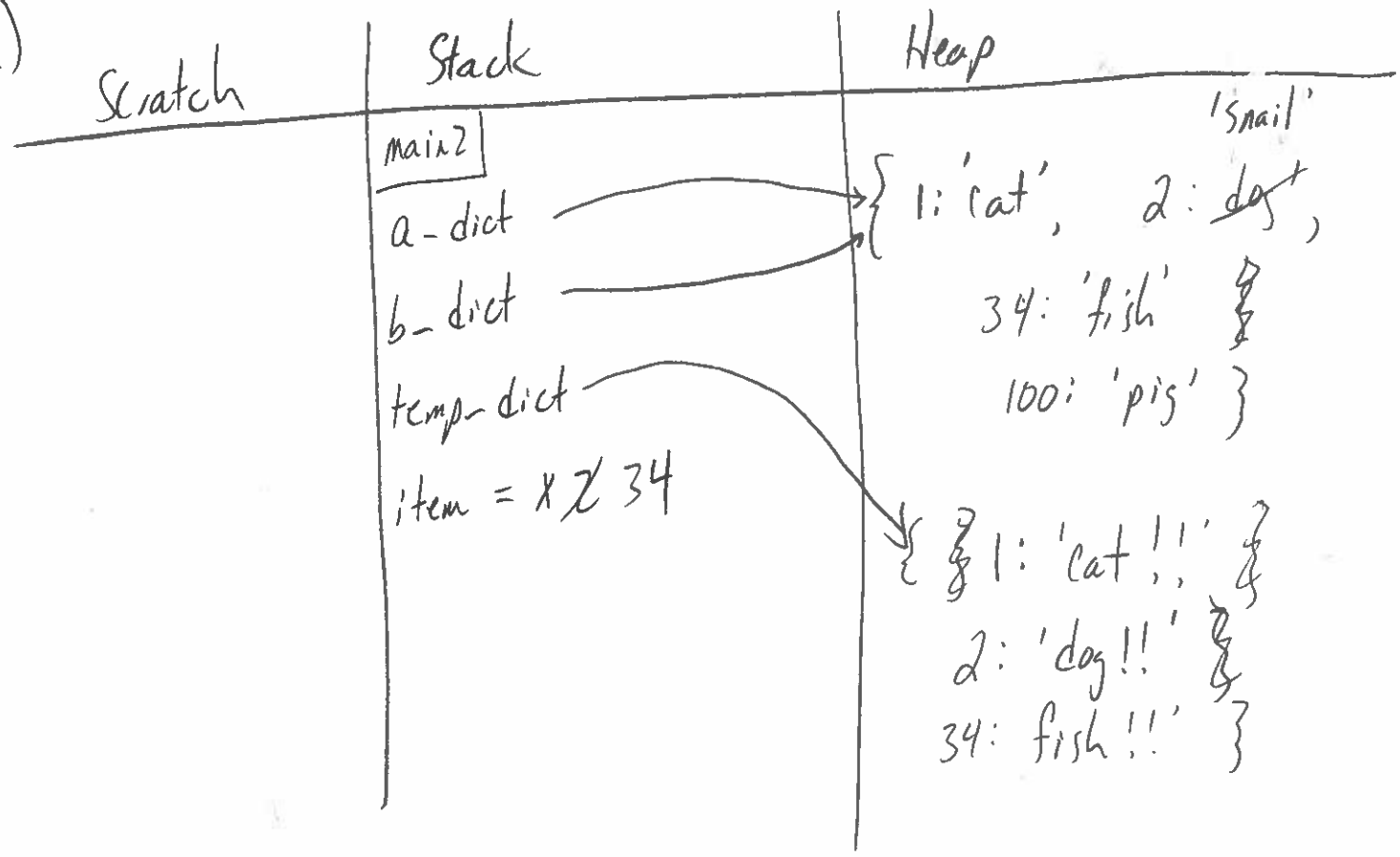


Printed Output

[1, -7, 3, 47]
[1, -7, 3, 47]
[2, 4, 6]

There is no elegant way to indicated changes in the heap. Just make clear what is happen.
You can always rewrite values/list as needed

2)



{ 1: 'cat', 2: 'snail', 34: 'fish', 100: 'pis' }

{ 1: 'cat', 2: 'snail', 34: 'fish', 100: 'pis' }

{ 1: 'cat!!', 2: 'dog!!', 34: 'fish!!' }

Note: item loops over the keys of a_dict

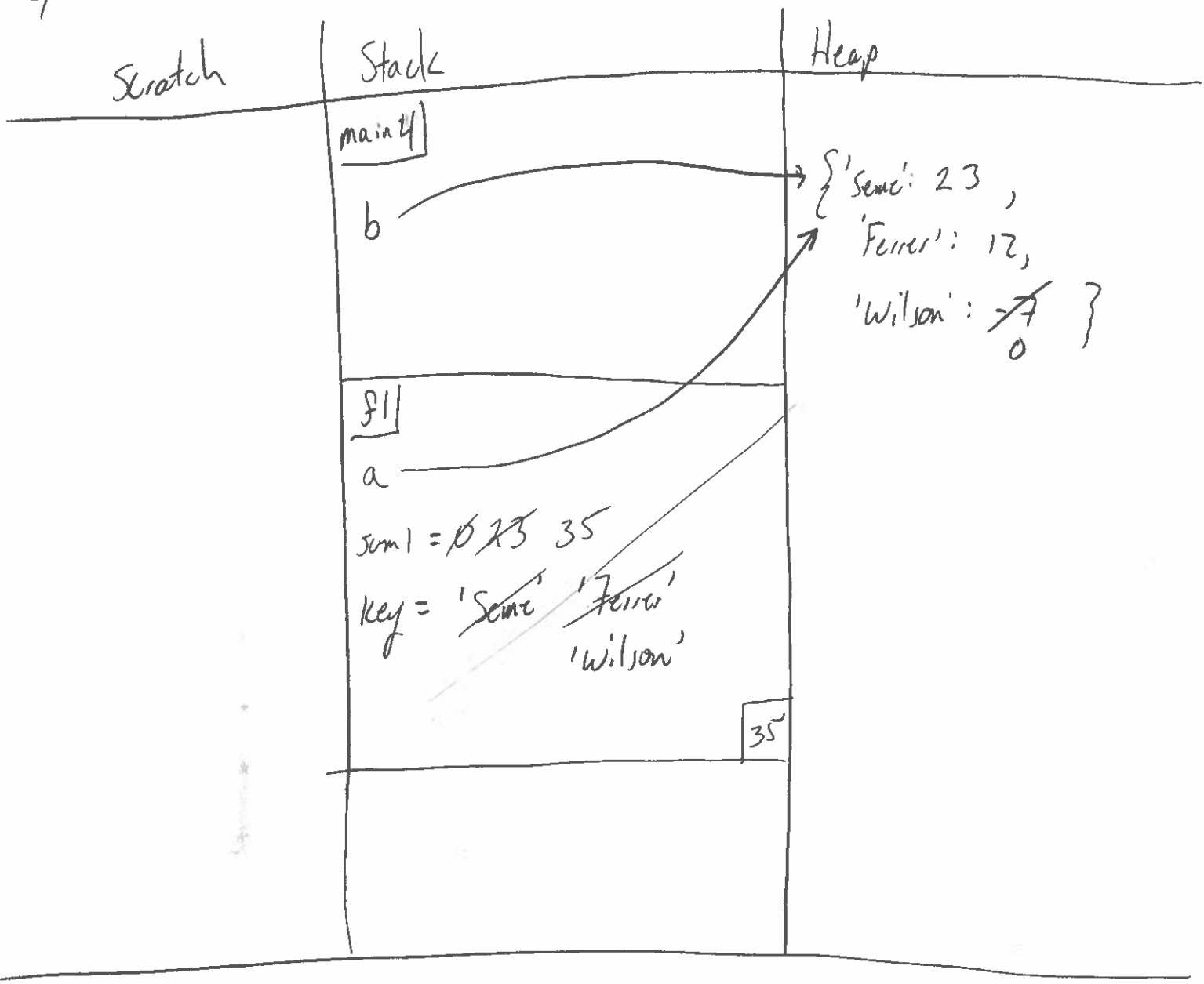
3

Scratch	Stack	Heap
	main 3 a_str = 'bye' b_str = ~~'bye'~~ 'byez' temp_str = ~~'b'~~ ~~'b!'~~ ~~'b!y!'~~ 'b!y!c!' item = ~~'b'~~ ~~'y'~~ 'c'	Since strings are immutable, nothing goes in the heap

bye
byez
b!y!c!

It is worth your time to think carefully about #1 - #3

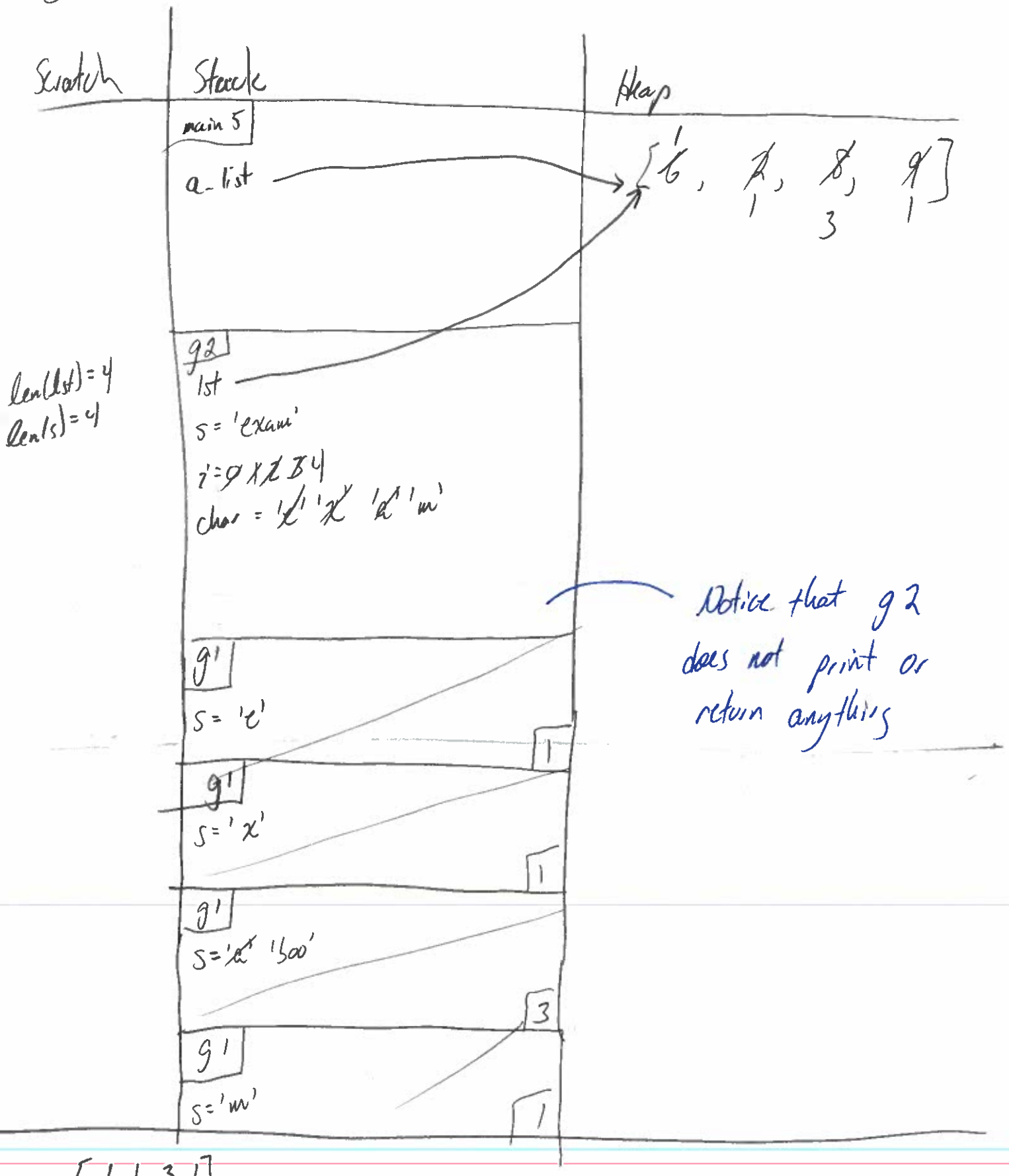
4



35

{'Seme': 23, 'Ferrer': 12, 'Wilson': 0}

5


Scratch
Stack
Heap
main 5
a_list
['e', 'x', 'a', 'm']
1 1 3 1
g2
lst
len(lst) = 4
len(s) = 4
s = 'exam'
i = 0 1 2 3 4
char = 'e' 'x' 'a' 'm'
Notice that g2 does not print or return anything
g1
s = 'e'
1
g1
s = 'x'
1
g1
s = 'a' 'boo'
3
g1
s = 'm'
1

[1, 1, 3, 1]