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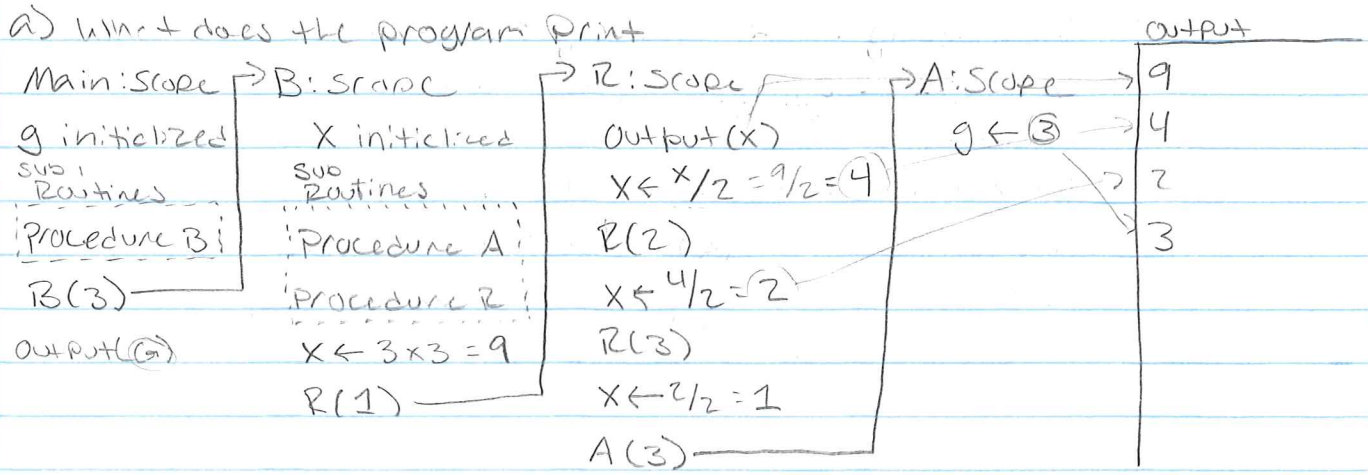
Problems: 3.6, 3.9a, 3.14

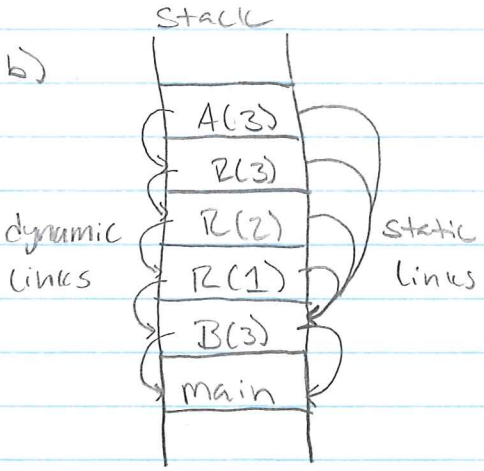
Chapter 3 exercises

3.6: Nested subroutines and static scope

a) What does the program print



b)



c) Explain how A finds g:
g is a local variable of main. A is a subroutine of B so it can reference it's static link to B. Then references B's static link to main.

3.9(a) Each int occupies 4 bytes. How much data is required for the variables in this program?

{ a, b, c ← always needed allocate (12 bytes)
{ d, e
{ f } } d, e, f and g, h, i will never be
{ g, h, i } } referenced at the same time so
we will only need to allocate an
additional (12 bytes)

Total: 24 bytes

3.14

When using Static Scoping: 1 1 2 2

When using dynamic scoping: 1 1 2 1

When using static scoping the set_x call from the 'second' procedure is able to see the global x and uses that, whereas, the dynamic scope will instead see only the local x.