CMPSC 461 Homework 3 Solutions. Prof. G. Tan

Q1 (6 points)

a) z=foo(x,y); pass by value: x = 1, y = 2, z = 36
b) z=foo(x,y); pass by reference: x = 24, y = 12, z = 36
c) z=foo(x,y); pass by value-result: x = 24, y = 12, z = 36
d) z=foo(y,y); pass by value: x = 1, y = 2, z = 36
e) z=foo(y,y); pass by reference: x = 1, y = 24, z = 48
f) z=foo(y,y); pass by value-result: x = 1, y = 12, z = 36

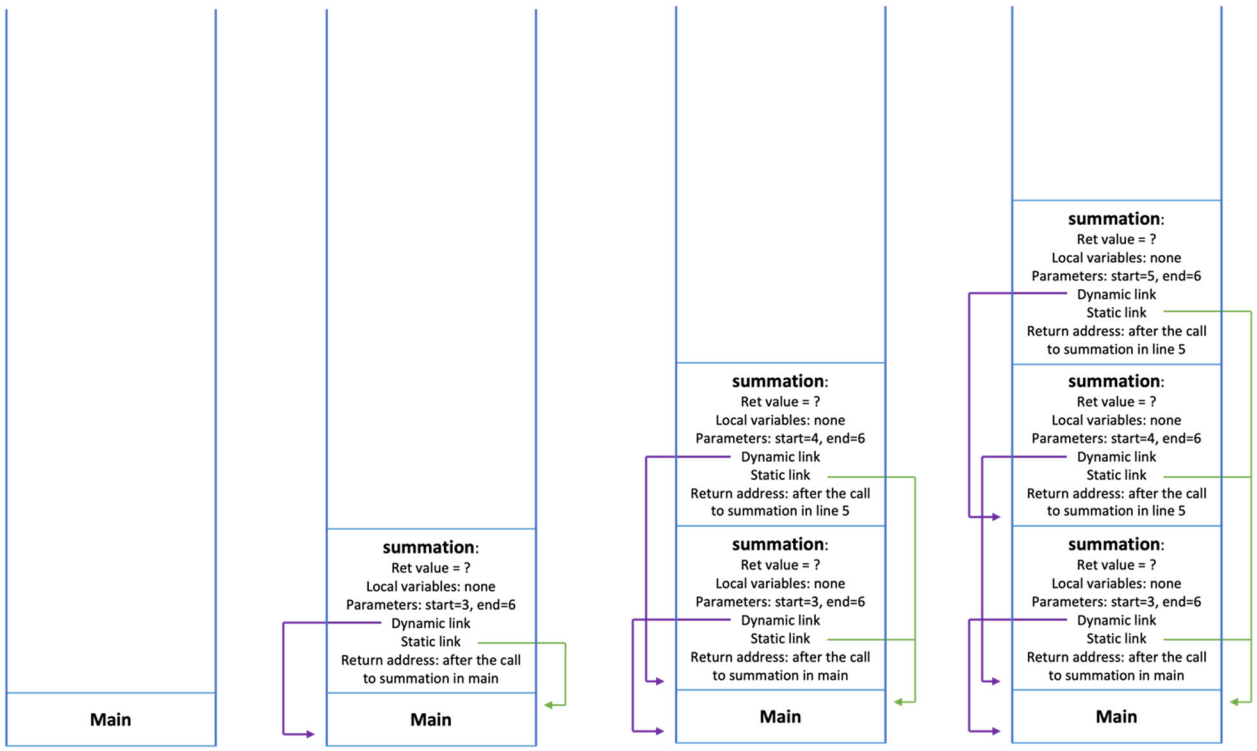
Q2 (2 points)

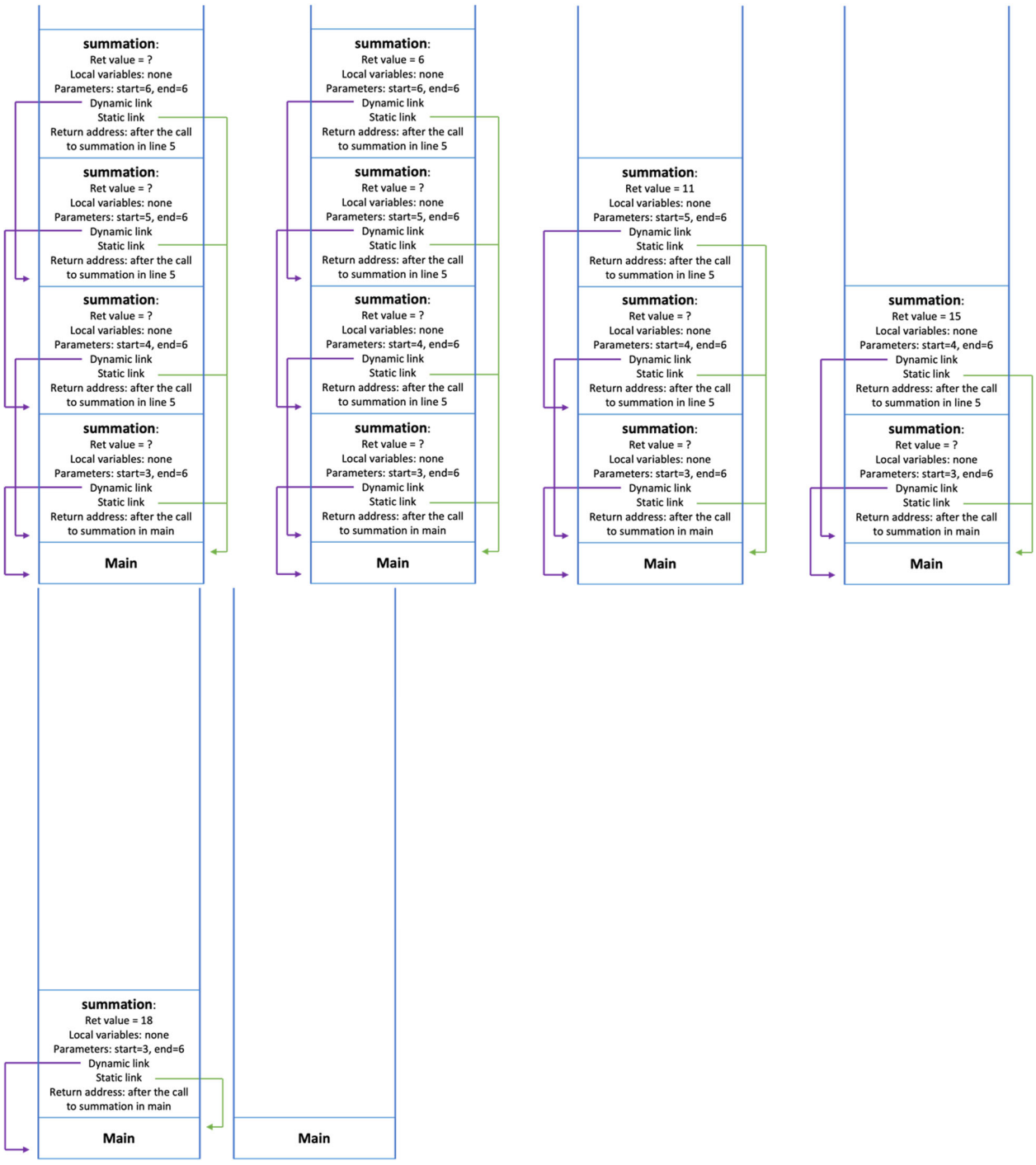
(a) For foo1: sum = 0
Call function bar with argument x = 3, y = 6; i gets to be an alias of x and j's storage is initialized to be 6; bar modifies x (and i) to be -3 and returns 2*(-3) = -6.
So, sum = bar(x, y)+y = -6 + 6 = 0.

(b) For foo2: sum = -15
Call to function bar with argument x = 2, y = 7; i gets to be an alias of x and j's storage is initialized to be 7; Function bar changes x (and i) to value -5 and returns value 2*(-5) = -10. So, sum = -10 after the return of bar. Then sum = sum + x = -10 + (-5) = -15.

Q3 (4 points)

Note: it's okay if the Main activation record is not drawn in the following diagrams; also, the homework description asked for only dynamic links, current values for all parameters, and the return value; so it would be okay if a solution doesn't draw static links and return addresses.


Main
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = ?
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = ?
Local variables: none
Parameters: start=5, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main


summation:
Ret value = ?
Local variables: none
Parameters: start=6, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=5, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = 18
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = 6
Local variables: none
Parameters: start=6, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=5, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = 11
Local variables: none
Parameters: start=5, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main
summation:
Ret value = 15
Local variables: none
Parameters: start=4, end=6
Dynamic link
Static link
Return address: after the call to summation in line 5
summation:
Ret value = ?
Local variables: none
Parameters: start=3, end=6
Dynamic link
Static link
Return address: after the call to summation in main
Main