CMPSC 461 Homework 3 Solutions. Prof. G. Tan

Q1

    a)   value: x=6, y=2, z=3
    b)   reference: x=6, y=5, z=3
    c)   value-ref: x=6, y=5, z=3
    d)   x=6, y=2, z=3
    e)   x=3, y=2, z=3
    f)   x=4, y=2, z=3

Q2

For foo1:   sum = 10

       Initially sum = 2.
       Call function bar with parameter x = 2.
       bar modifies x to be 4 and returns 2*4 = 8.
       So, sum = 2+bar(x) = 2+8 = 10.

For foo2:   sum = 12
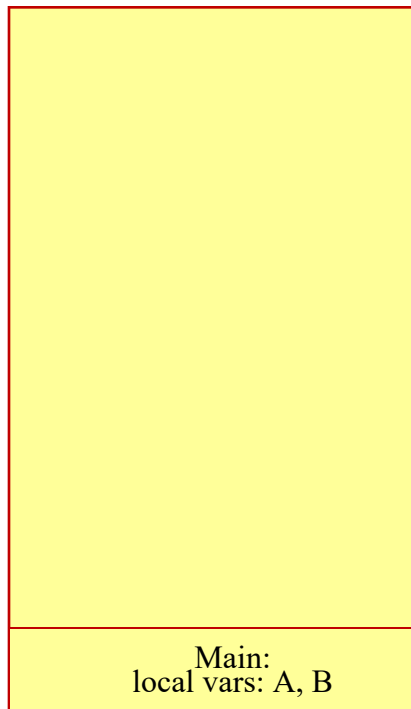
       Call to function bar with parameter x = 2.
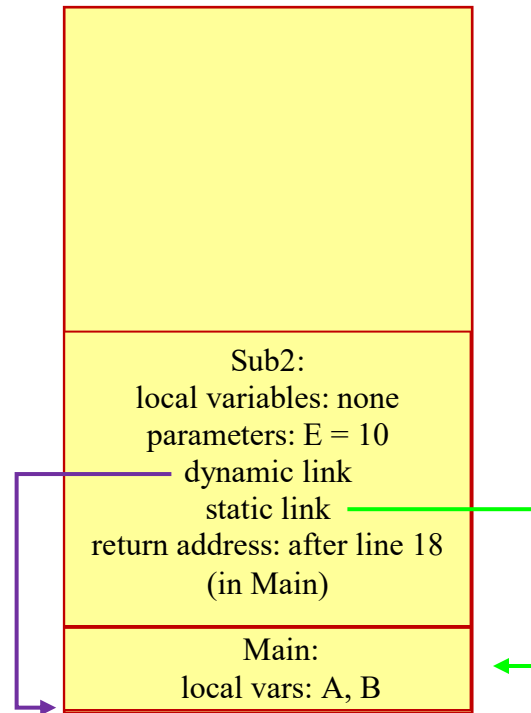   Function bar changes x to value 4 and returns value 2*4 = 8.
       So, sum = 8. Then sum = sum + x = 8+4 = 12.

Problem 3:

→ Step 1:

→ Step 2:

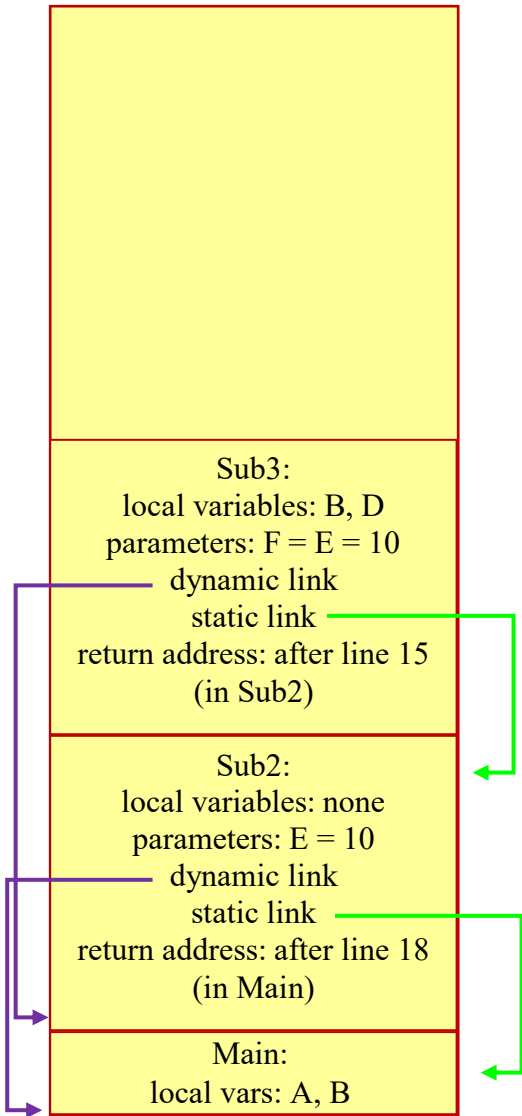**Step 1:**

Main: local vars: A, B

Step 2:

Sub2: local variables: none parameters: E = 10 dynamic link static link return address: after line 18 (in Main)
Main: local vars: A, B

→ Step 3:

Sub3: local variables: B, D parameters: F = E = 10 dynamic link static link return address: after line 15 (in Sub2)
Sub2: local variables: none parameters: E = 10 dynamic link static link return address: after line 18 (in Main)
Main: local vars: A, B

→ Step 4:

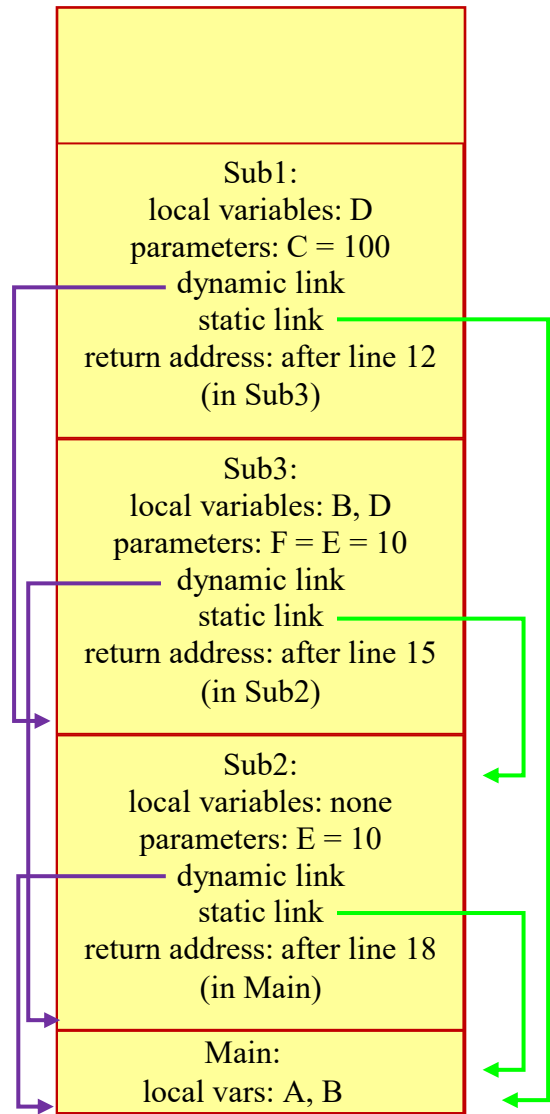| |
|---|
| |
| Sub1:
local variables: D
parameters: C = 100
dynamic link
static link
return address: after line 12
(in Sub3) |
| Sub3:
local variables: B, D
parameters: F = E = 10
dynamic link
static link
return address: after line 15
(in Sub2) |
| Sub2:
local variables: none
parameters: E = 10
dynamic link
static link
return address: after line 18
(in Main) |
| Main:
local vars: A, B |

Step 3 shows the stack of activation records before line 12 of the program's execution.

Step 4 shows the stack of activation records before line 6 of the program's execution.