

1.

There are outer block allocates of variables a,b, and c.

then two variables allocates d and e.

and then one variable allocate of f.

and then another three variables g,h,and i allocated in a sepearte block after a, b, and c.

because of g,h and i are allocated in a separate block, they are not in the same block as a, b, and c.

so the amount of bytes that the code takes is 24 bytes after allocating 6 variables

2.

P is a procedure

B: is real and a parameter of procedure P

X: is real

Q is a procedure and a subroutine of procedure P

R is a procedure and a subroutine of procedure P

A is real and a of parameter of R

C is real and a of parameter of R

Z is real

3.

a)

In the print statment in line 7, a refers to line 2 where it equals and prints 1.

In the print statment in line 7, b refers to line 5 where it equals to a and prints 1.

In the print statment in line 11, a refers to line 8 where it equals and prints 3.

In the print statment in line 11, b refers to line 5 where it equals to a and prints 1.

In the print statment in line 14, a refers to line 2 where it equals and prints 1.

In the print statment in line 14, b refers to line 3 where it equals and prints 2.

b)

In the print statment in line 7, a refers to line 8 where it equals and prints 3.

In the print statment in line 7, b refers to line 5 where it equals to a and prints 1.

In the print statment in line 11, a refers to line 8 where it equals and prints 3.

In the print statment in line 11, b refers to line 5 where it equals to a and prints 1.

In the print statment in line 14, a refers to line 2 where it equals and prints 1.

In the print statment in line 14, b refers to line 3 where it equals and prints 2.

A sematic error will occur due to a in line 5 that has not yet been defined. This same error occurs with a that to be printed in line 7.

c)

In the print statment in line 7, a refers to line 8 where it equals and prints 3.

In the print statment in line 7, b refers to line 5 where it equals to a and prints 1.

In the print statment in line 11, a refers to line 8 where it equals and prints 3.

In the print statment in line 11, b refers to line 5 where it equals to a and prints 3.

In the print statment in line 14, a refers to line 2 where it equals and prints 1.

In the print statment in line 14, b refers to line 3 where it equals and prints 2.

4.

a)

The program prints 3, this is due to the program adding the global variables to x and y in the add function.

b)

The program prints 4, this is due to deepbind working when the y variable is passed to procedure second, updating it globally and adding it with global x.

c)

The program prints 1, this is because due to shallow binding treating variables as Local and therefore they are not updated globally.