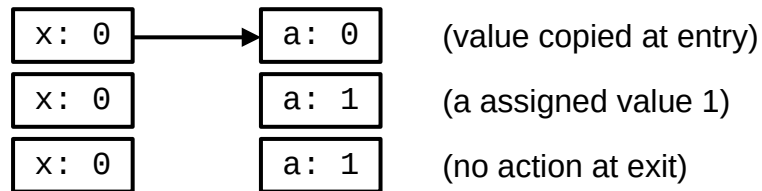


CS 430 Parameters Lab

1. Suppose a subprogram `void f(int a) { a = 1 }` is called with the statement `f(x)`, where `x` is a local variable with initial value 0. Draw pictures and labels to show how the value of `x` is passed between the subprogram and its caller using (a) pass-by-value, (b) pass-by-result, (c) pass-by-value-result, and (d) pass-by-reference. The first one has been completed for you as an example.

(a) Pass-by-value:



(b) Pass-by-result:

(c) Pass-by-value-result:

(d) Pass-by-reference:

2. Which of the five parameter passing mechanisms discussed in class implement *in* mode semantics?

3. Which of the five parameter passing mechanisms discussed in class implement *out* mode semantics?

4. Which of the five parameter passing mechanisms discussed in class implement *inout* mode semantics?

For #5-8, consider the following program in a C-like language with static scope. What is the output of this program under each of the following conditions?

```

program p {
  int[] m = [2, 3, 5, 7, 11, 13, 17];
  int x, y = 0, 1;

  void g(int[] a, int b, int c)
  {
    a[b] = 0;
    b += 1;
    y += b;
    a[c] = 8;
  } // end of g

  println(m[0], m[1], m[2], x, y); // Line A
  g(m, x, y);
  println(m[0], m[1], m[2], x, y); // Line B
  g(m, y, y); // different parameters!
  println(m[0], m[1], m[2], x, y); // Line C
}

```

5. All parameters are passed by value.

	m[0]	m[1]	m[2]	x	y
Line A	2	3	5	0	1
Line B					
Line C					

6. All parameters are passed by reference.

	m[0]	m[1]	m[2]	x	y
Line A	2	3	5	0	1
Line B					
Line C					

7. Integer parameters are passed by value and array parameters are passed by reference.

	m[0]	m[1]	m[2]	x	y
Line A	2	3	5	0	1
Line B					
Line C					

8. All parameters are passed by value-result. Results are assigned from right-to-left.

	m[0]	m[1]	m[2]	x	y
Line A	2	3	5	0	1
Line B					
Line C					