

Call-by-value and call-by-name differences in the PCF semantics.

The two differences in the two denotational semantics are in the application and the let-rec. The difference in the application is straightforward - in the case of call by name, the application is lazy, and does not evaluate the argument a priori. In the case of call-by-value, we see that in case either u or v evaluate to bottom, the entire argument evaluates to bottom. Hence, it is eager.

Similarly, in the case of letrec, we once again see that the evaluation in call-by-value, the fixed-point operator deals only on the values of the argument. Hence, it needs to be eagerly evaluated, and the difference is once again, that for call-by-name PCF the operator doesn't deal only with values.