Email Client

Email address(es)
(valid and invalid)

Delivery
(pass or fail)

Failure Test:

- Invalid email address
- Invalid SMTP server
- Invalid IMAP server
- Large Message
- Blank recipient

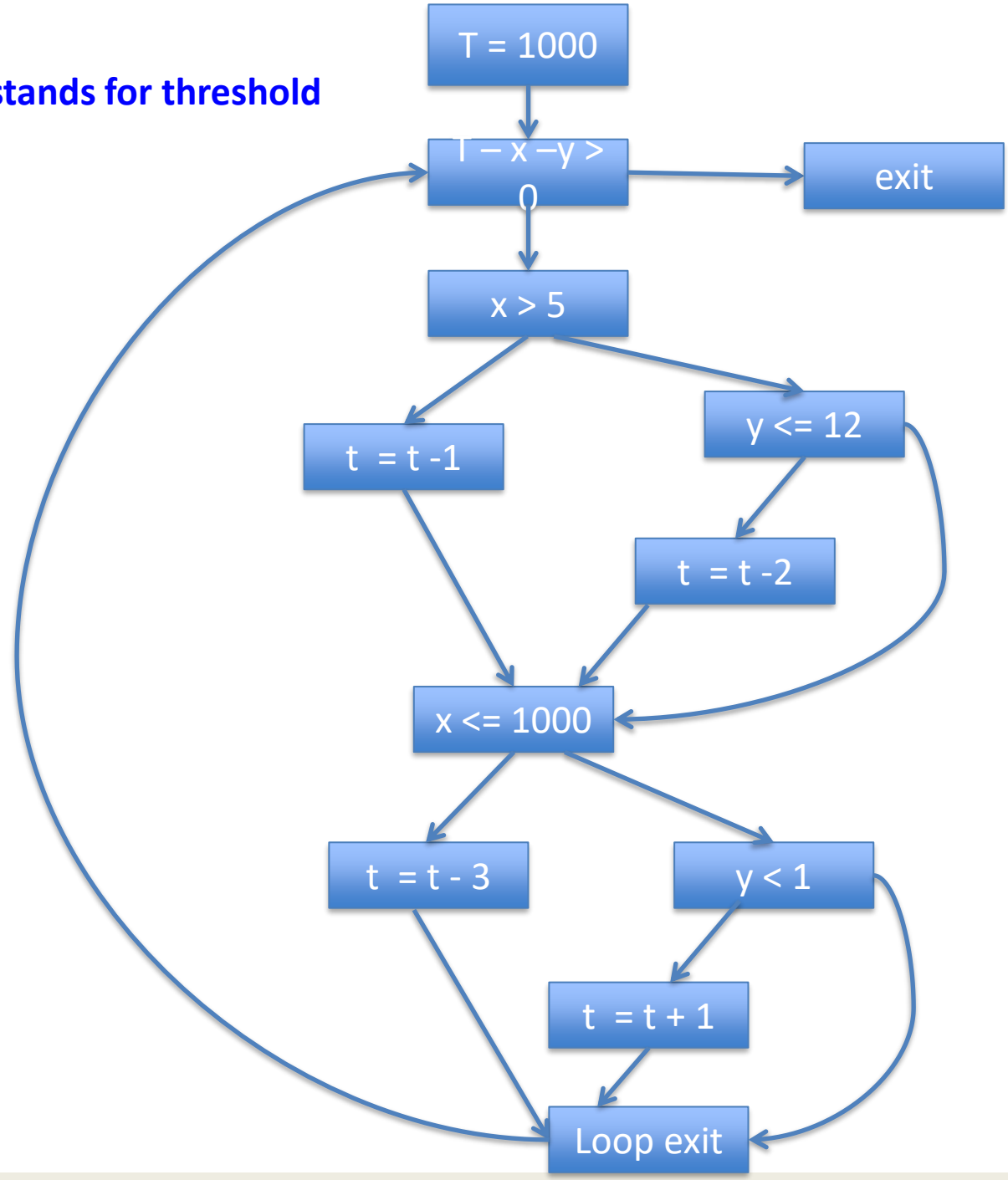
Successful Test:
- Sending a valid email

Exercise 6

- Open Disk.java. Draw the control flow graph of the function manipulate().

Disk.java

Ans: T stands for threshold

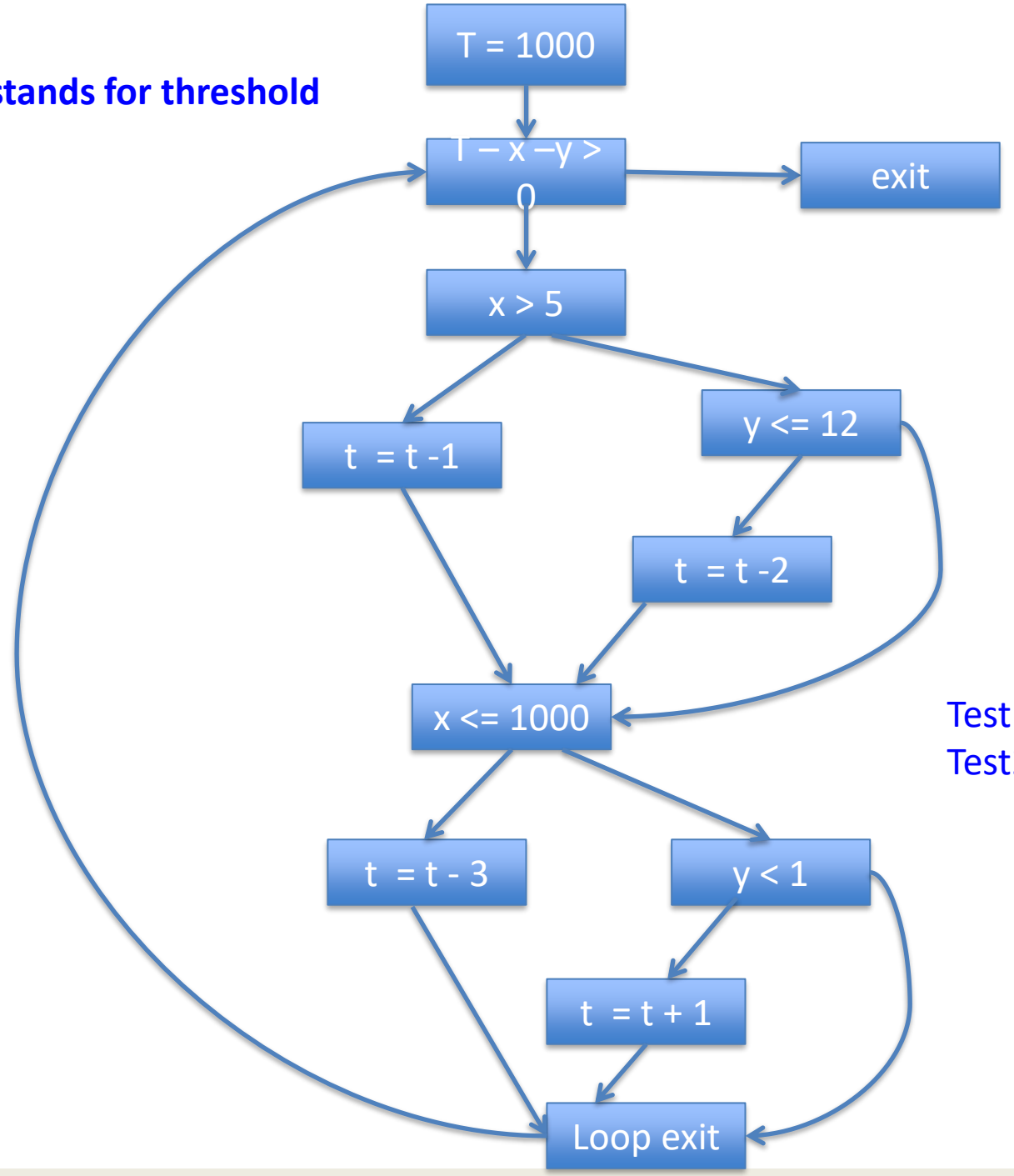


Exercise 7

- Write a set of tests to cover each statement (if feasible) of the manipulate() function. How many tests did you write? Is it the minimum number of tests to cover all the statements?

Disk.java

Ans: T stands for threshold



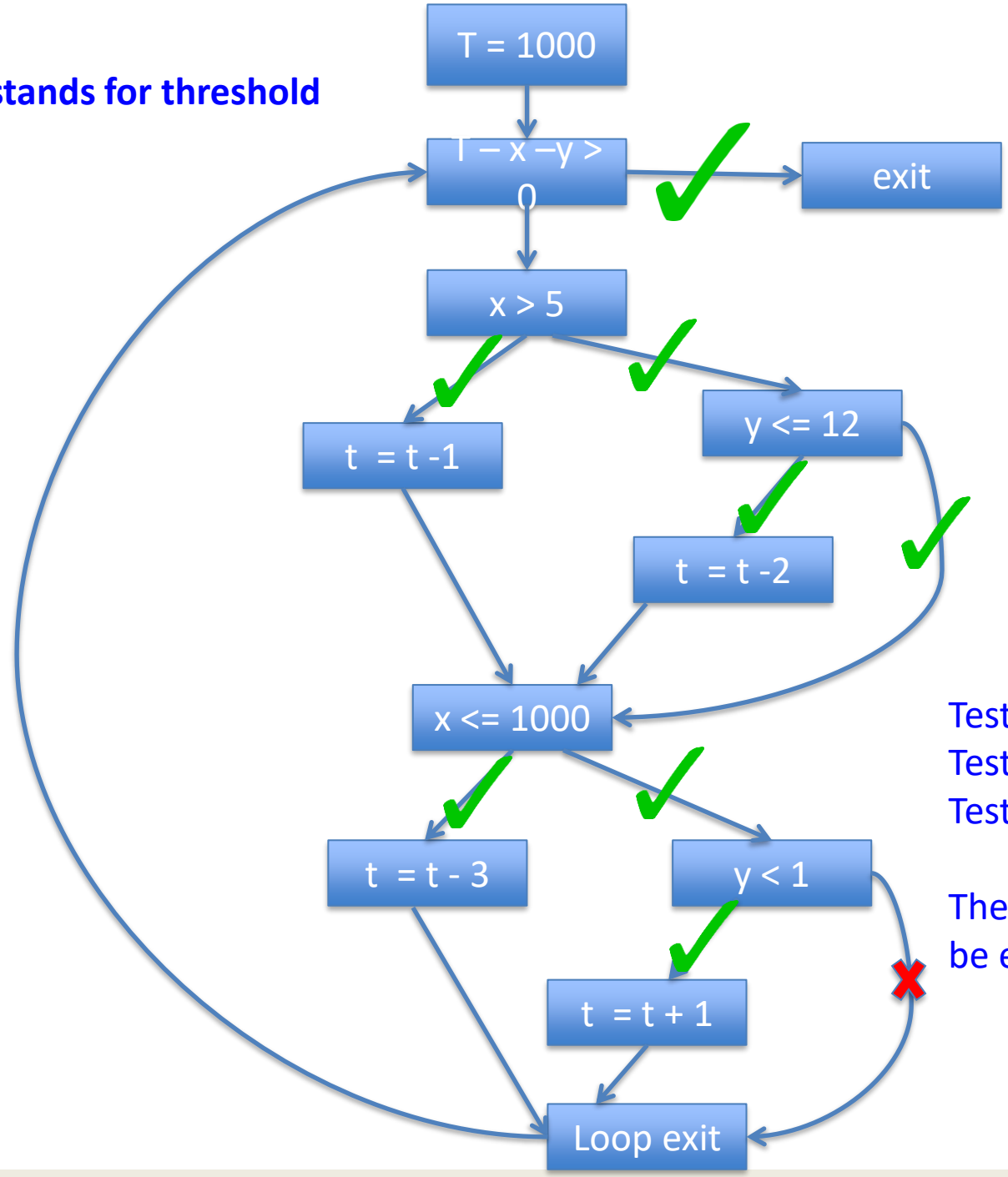
Test1 => {X = 1010, y = -20}
Test2 => {X = 5, y = -20}

Exercise 8

- Write a set of tests to cover each branch of the manipulate() function, if feasible. How many tests did you write? Is it the minimum number of tests to cover all the branches?

Disk.java; DiskBranchCoverage.java

Ans: T stands for threshold



Test1 => {X = 1010, y = -20}
Test2 => {X = 5, y = -20}
Test3 => {X = 5, y = 15}

The crossed branch can neve
be executed by any test.

Exercise 9

- Assume that the loop in the manipulate() function is terminated after **at most** 100 iterations (i.e. after 0 iteration, 1 iteration, …., 100 iterations etc.). Based on this assumption, compute the possible number of executed paths in the manipulate() function. Explain your answer.

Ans. 201 paths. There are three feasible paths inside the loop, but only two among them can terminate after at most 100 iterations. Since the loop can execute 0 to 100 iterations, the total number of paths is 201.

Exercise 10

- Consider your test cases that obtain branch coverage in the manipulate() function. Argue whether the test suite also obtains the condition coverage.

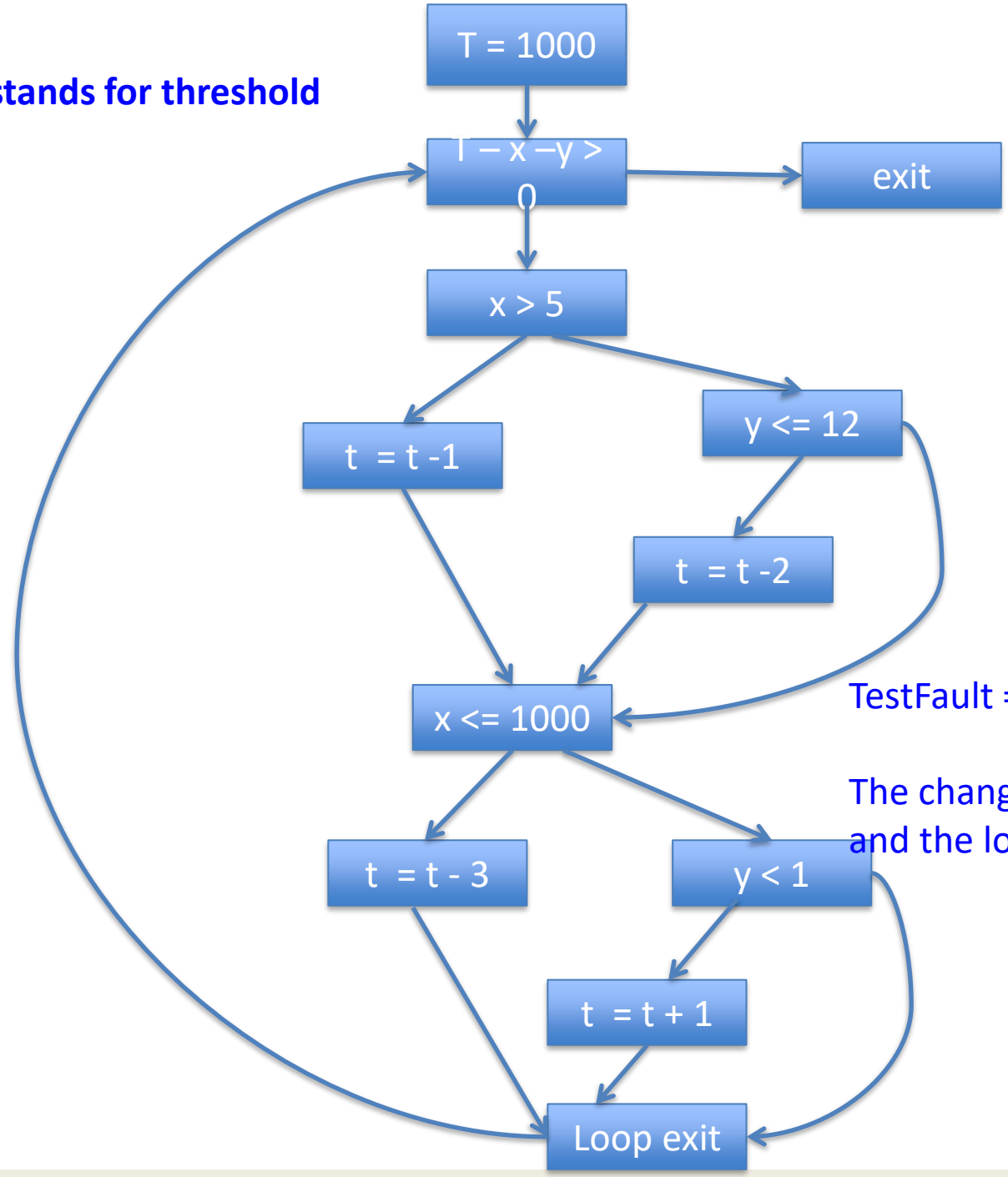
Ans: Yes, it also obtains condition coverage, as all the branch conditions are atomic conditions in the manipulate() function.

Exercise 11

Consider Disk.java. Assume that specification requires all the functions in the Disk class to be terminating. Write a Junit test that potentially reveals a bug in the manipulate() function.

DiskFaultTest.java

Ans: T stands for threshold



TestFault => {X = 1010, y = -20}

The changes to “t” cancels out and the loop never terminates.