Software Testing

Hands on…

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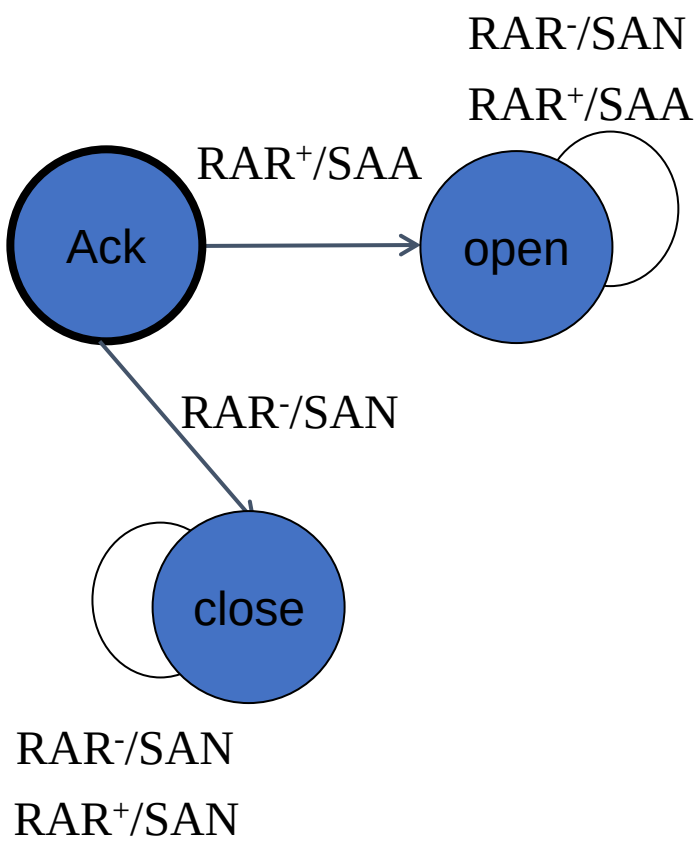
Model (Finite State Machine) Based Test Generation

- Tools are available!!!
  - You need to extract the reduced complete deterministic FSM describing the behavior of a program
  - E.g., https://bitbucket.org/JanPeleska/libfsmtest

In order to install Libfsmtest you need to :

- Follow the instructions of https://bitbucket.org/JanPeleska/libfsmtest/src/master/README.md
- Add the directory *pap-demo/* available on https://bitbucket.org/JanPeleska/libfsmtest/src/master/ to the directory *src/* of Libfsmtest

Libfsmtest: PAP with one attempt to authenticate



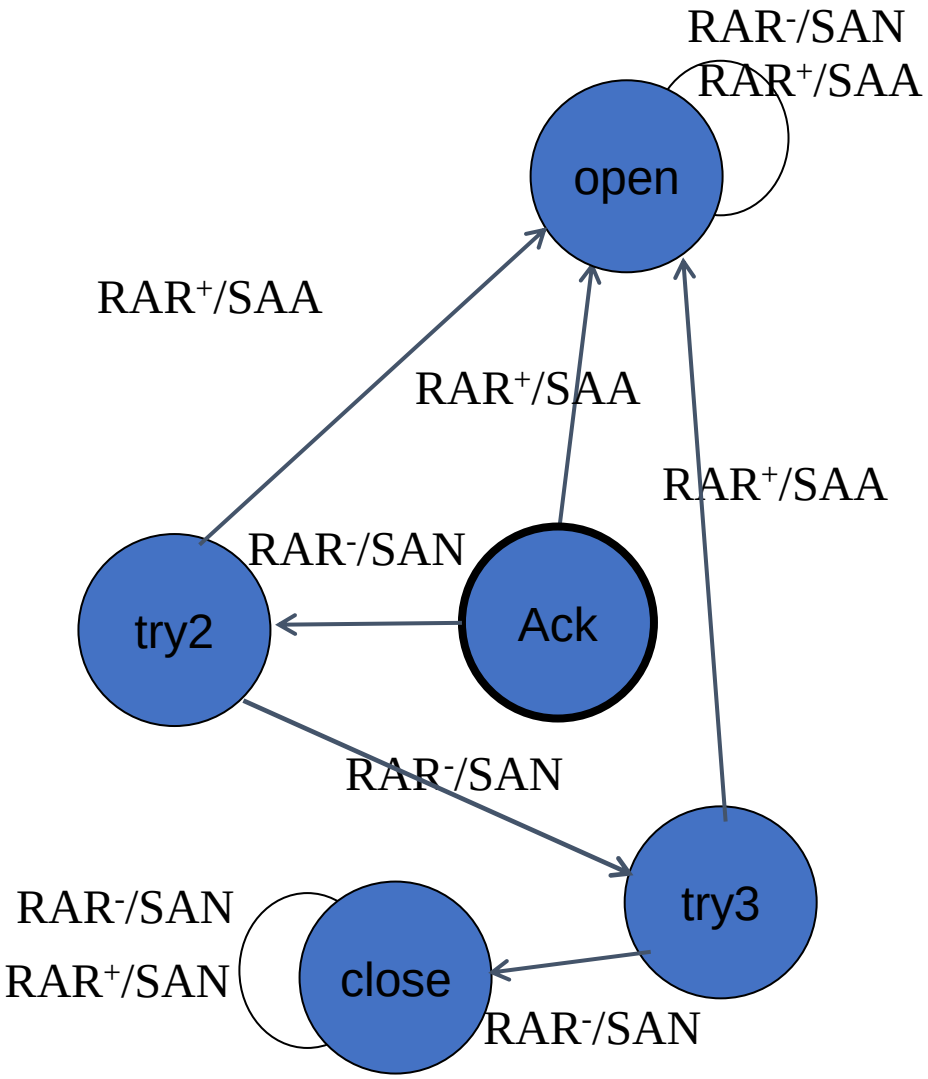
- Describe the SPEC FSM in an available format (.csv, .fsm, …)

	A	B	C
1		RAR_plus	RAR_minus
2	Ack	open/SAA	close/SAN
3	open	open/SAA	open/SAA
4	close	close/SAN	close/SAN

- If the FSM is given in .csv format then you need to additionally apply the script *csv_parser.py* available on https://github.com/vinevg1996/SoftwareTestingLab

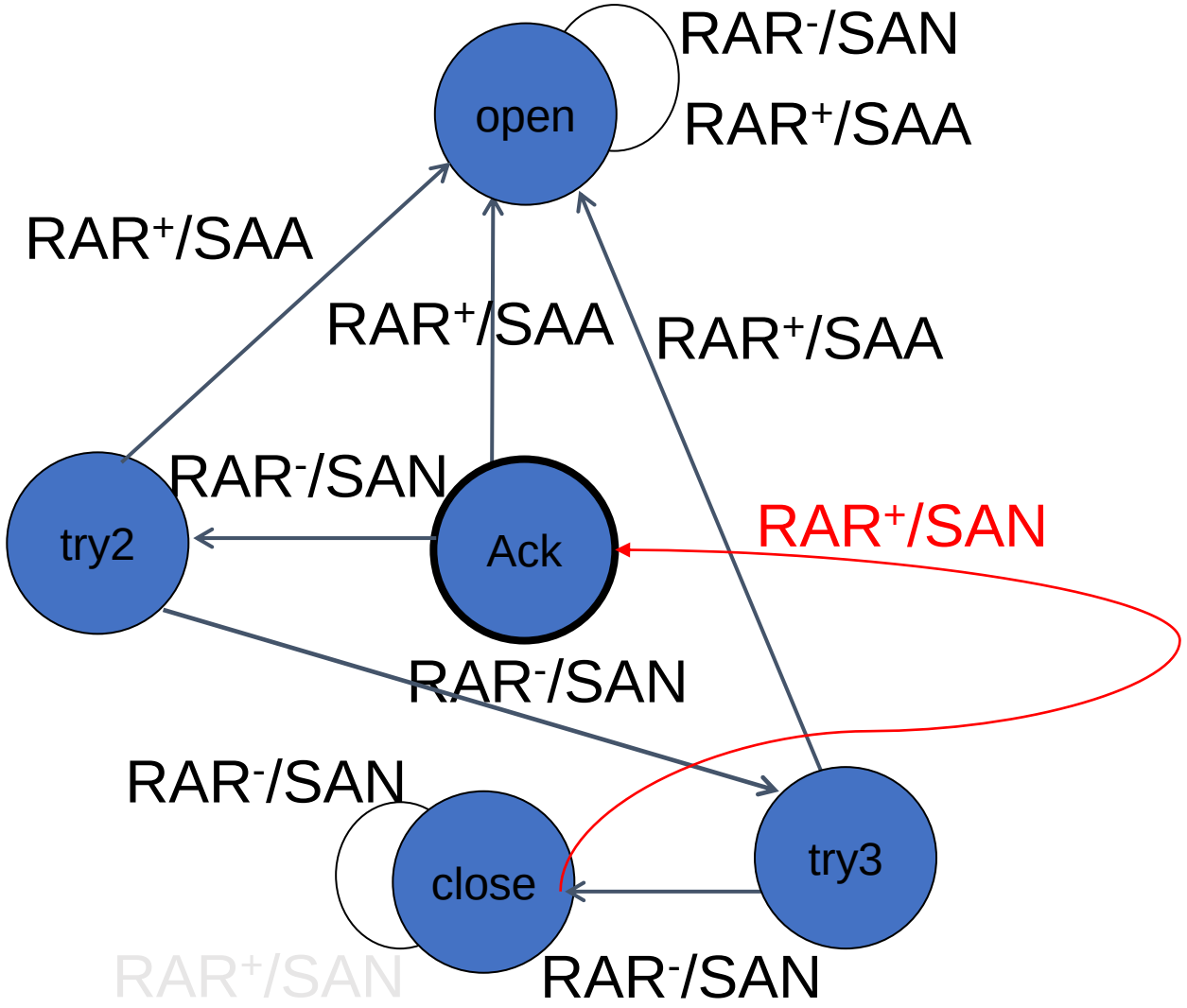
```
static void demo_csvInput_pap() {

    FsmPtr fsm = createFsm<FsmFromFileCreator>(RESOURCEPATH_PAP+"pap2.csv",
                                               "pap2",
                                               make_unique<ToAutoCompleteWithSelfLoopTransformer>(nullptr, "null"));


    ToDotFileVisitor dot("pap2.dot");
    fsm->accept(dot);
    dot.writeToFile();

    // Create the test generation framework with the W-Method
    size_t numAddStates = 0;
    TestGenerationFrame<WMethod> genFrame("SUITE-W-3", move(fsm), numAddStates);

    // Generate the test suite and write it to file
    genFrame.generateTestSuite();
    genFrame.writeToFile();

}
```

PAP with three attempts to authenticate



- A naive/simulation of an implementation can be found on: https://github.com/jorgelopezcoronado/PAPLab
- The Code can be compiled in a *-nix system with *make* utility and then executed with *./pap* (Mac OS X executable included)
- Valid user/password combinations may be found in the file users.db, a single user/password entry per line: user and password separated by a single space

Testing the PAP implementation



- *How can we test it using Libfsmtest?*

- *The implementation provided has the fault!!!*
  - *What is the test suite derived using the transition tour method **?** Does it detect the fault**?***
  - *What is the test suite derived using the W-method**?** Does it detect the fault**?***

Your tasks

1. Study the Libfsmtest and derive a test suite using the W-method for the FSM of PAP
2. Develop the program to execute the test suites against the PAP implementation
3. Apply the test suites derived at step 1 :
   - Does the test suite derived using the W-method detect the fault in the PAP code ?

Thank you for your attention
Questions ?