Tutorial 4: Running a Performance Test on An Agent

Running a performance test on an agent can be done by the GUI or using the command prompt. Both modes will produce the same result but using both is not necessary.

Preparation

1. Complete Generate the Case Base with the GUI or Generate the Case Base with the Command Prompt from Tutorial 3: Running an Imitation Agent
   a. Do not delete any files that were created during Tutorial 3.

(Optional) Generating the Agent Case Base

1. Follow the steps in Merge Case Bases from Tutorial 3.
   a. The cases bases that you merge must not include any of the cases bases that you wish to use as a test
   b. A unmerged case base will also work as the agent case base, but using a case base merged with multiple case bases will allow the agent to have a larger sample of cases to compare to when being tested.

Running a Performance Test Using the GUI

1. Open up command prompt and move to the RCSS directory. Run the RCSImitate Performance Test GUI(Figure 1) by entering the following:
   ```
   java -cp RCSImitate-0.4.jar;JIFSA-0.5.jar;RCSLogServer-0.3.jar;.
   org.RCSImitate.gui.PerformanceTestFrame
   ```
2. Enter the information into the correct fields
   a. Agent Case Base - The case base that the test case base will be compared with
   b. Test Case Base - The case base that is to be tested
   c. Weights - The file containing preset weights used in the test
      i. By default all weights except the ball and team mate will be set to zero. Ball and team mate will be set to one
   d. Preprocessing - Different filters and features selection that will be applied to both the Agent and Test Case Base before testing. Features and selections can be entered short form or their full names
      i. Current Features and Filters are NoActionFilter (naf), FeatureDistancePresort (fdp), SequentialBackwardGeneration (sbg), ZeroWeightFilter (zwf), and RoughSetFeatureSelection (rsfs)
      ii. Multiple features and selections are seperated by a comma.
      iii. Information on each feature and filter at the bottom of the tutorial

e. Tests to Run - Select the different test to run for the test case base
    i. Classification Statistic Wrapper - Calculates the percision, recall, and f-measure for the different actions as well as the classification accuracy and global f-measure
    ii. Mean Execution Time - Calculates the average time to compute each test
f. Other Options
    i. Save Artifacts - It will save a case base for each preprocessing feature/filter applied to the case base
    ii. Test ID - An additional ID added to the name of final case base file
g. Load/Save - Allows the current setting of the in each of the performance test window to be saved or loaded.

3. Once all information has been entered, Click the "Run Test" button. A secondary window (Figure 2) will open up showing the case bases being loaded, the preprocessing being applied and the final output of the tests.

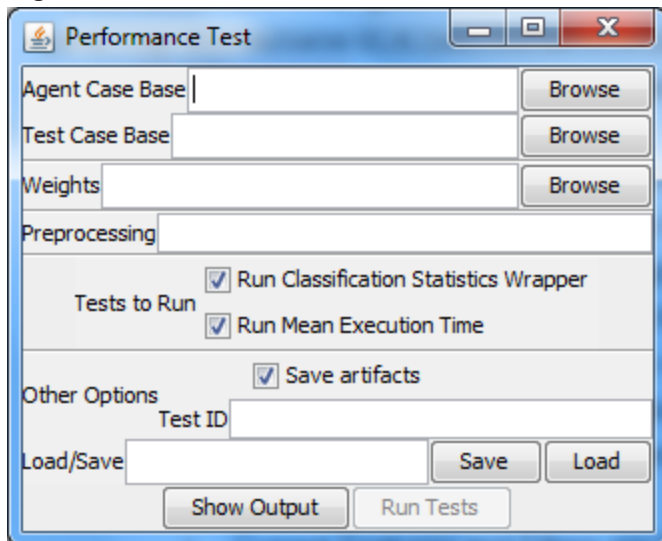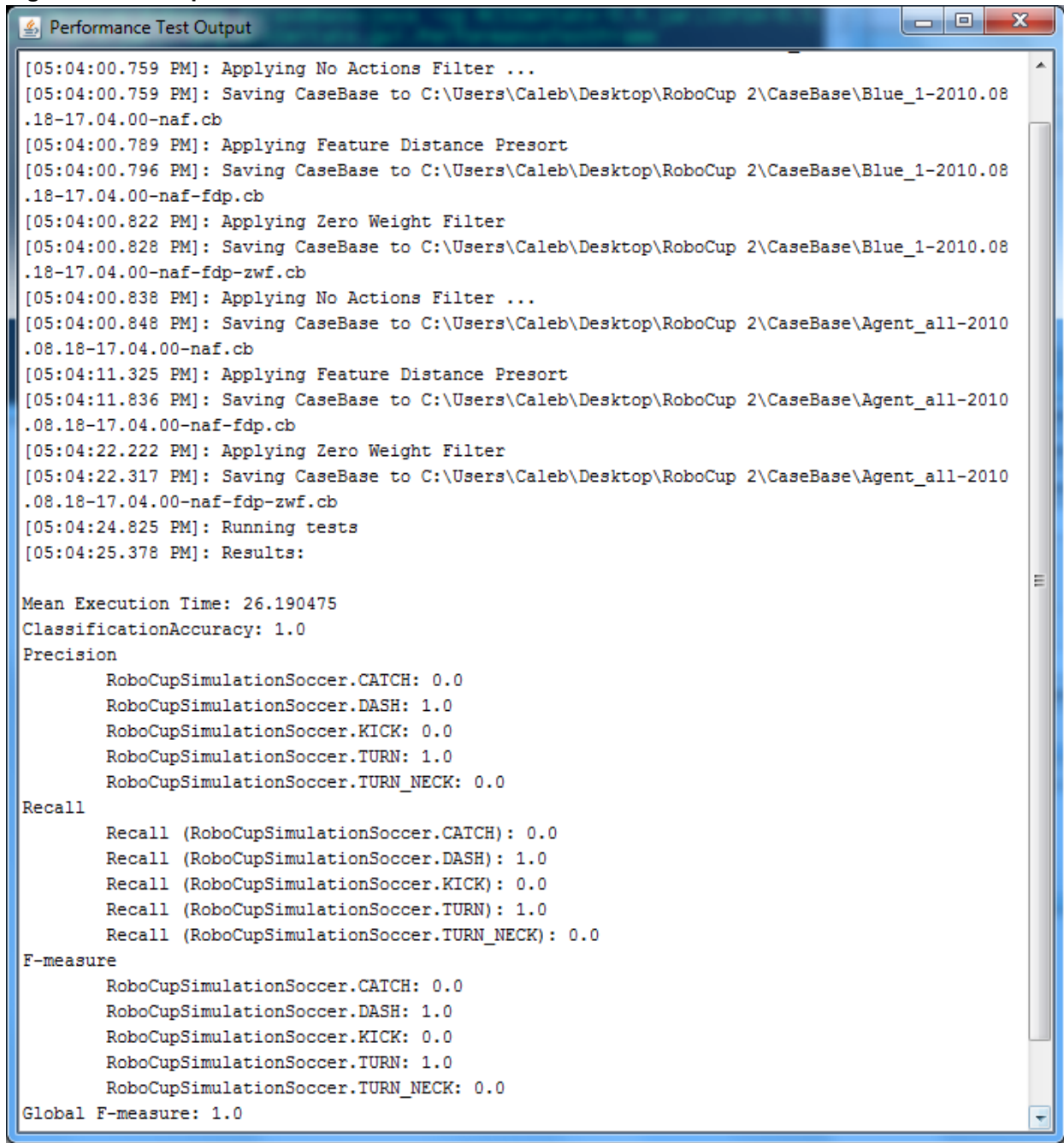**Figure 1: The RCSImitate GUI of the Performance Test window**

Figure 2: The output window for the Performance Test


```
Performance Test Output                                              _  □  X

[05:04:00.759 PM]: Applying No Actions Filter ...
[05:04:00.759 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Blue_1-2010.08
.18-17.04.00-naf.cb
[05:04:00.789 PM]: Applying Feature Distance Presort
[05:04:00.796 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Blue_1-2010.08
.18-17.04.00-naf-fdp.cb
[05:04:00.822 PM]: Applying Zero Weight Filter
[05:04:00.828 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Blue_1-2010.08
.18-17.04.00-naf-fdp-zwf.cb
[05:04:00.838 PM]: Applying No Actions Filter ...
[05:04:00.848 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Agent_all-2010
.08.18-17.04.00-naf.cb
[05:04:11.325 PM]: Applying Feature Distance Presort
[05:04:11.836 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Agent_all-2010
.08.18-17.04.00-naf-fdp.cb
[05:04:22.222 PM]: Applying Zero Weight Filter
[05:04:22.317 PM]: Saving CaseBase to C:\Users\Caleb\Desktop\RoboCup 2\CaseBase\Agent_all-2010
.08.18-17.04.00-naf-fdp-zwf.cb
[05:04:24.825 PM]: Running tests
[05:04:25.378 PM]: Results:

Mean Execution Time: 26.190475
ClassificationAccuracy: 1.0
Precision
        RoboCupSimulationSoccer.CATCH: 0.0
        RoboCupSimulationSoccer.DASH: 1.0
        RoboCupSimulationSoccer.KICK: 0.0
        RoboCupSimulationSoccer.TURN: 1.0
        RoboCupSimulationSoccer.TURN_NECK: 0.0
Recall
        Recall (RoboCupSimulationSoccer.CATCH): 0.0
        Recall (RoboCupSimulationSoccer.DASH): 1.0
        Recall (RoboCupSimulationSoccer.KICK): 0.0
        Recall (RoboCupSimulationSoccer.TURN): 1.0
        Recall (RoboCupSimulationSoccer.TURN_NECK): 0.0
F-measure
        RoboCupSimulationSoccer.CATCH: 0.0
        RoboCupSimulationSoccer.DASH: 1.0
        RoboCupSimulationSoccer.KICK: 0.0
        RoboCupSimulationSoccer.TURN: 1.0
        RoboCupSimulationSoccer.TURN_NECK: 0.0
Global F-measure: 1.0
```

Running a Performance Test Using the Command Prompt

1. Open a command prompt and move to the RCSS directory
2. Run the following command (all on one line)(Figure 3):

```
java -cp RCSImitate-0.4.jar;JIFSA-0.5.jar;RCSLogServer-0.3.jar;.
org.RCSImitate.tools.PerformanceTest -agentcasebasename AgentCaseBase
-testcasebasename TestCaseBase -preprocessing Filter/Features -testID
IDName [options]
```

where:
AgentCaseBase - The agent case base name
TestCaseBase - The test case base name
Filter/Features - The features used on each case bases
IDName - The ID added on to the case base file name

The [options] commands are:

`-enable-csw / -disable-csw` = Enables or disables Classification
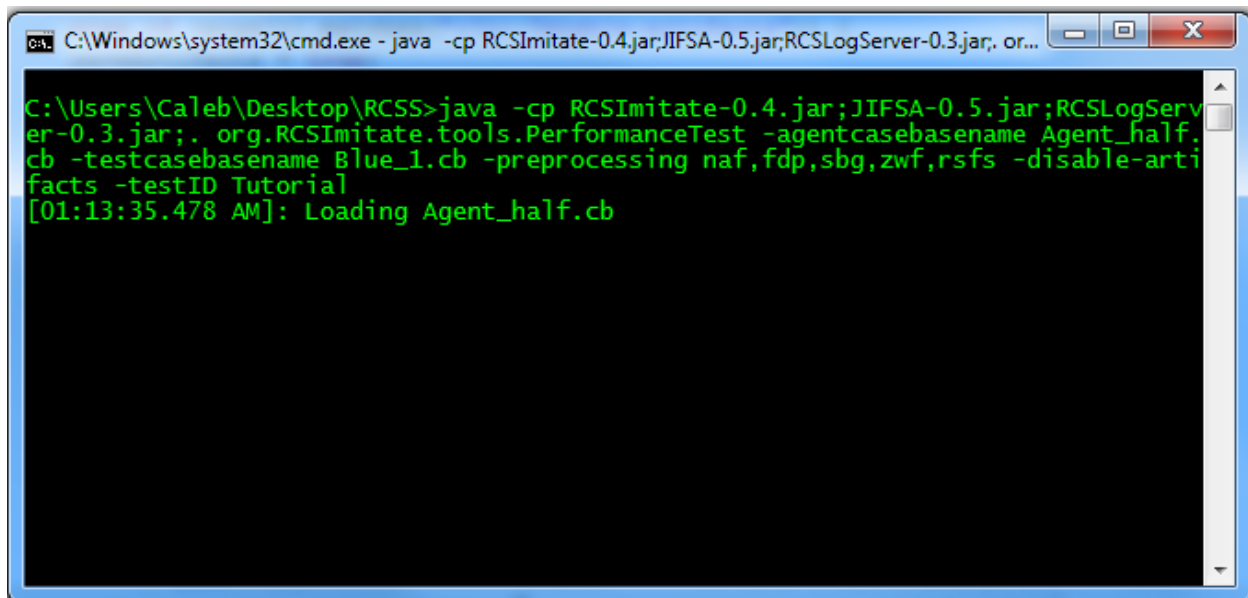Statistics Wrapper
`-enable-met / -disable-met` = Enables or disables Mean Execution Time
`-enable-artifacts / -diable-artifacts` = Enables or disables Artifacts
`-argsfile FileName` = An additional file containing more commands

3. When all the information is entered correctly, any text that would be displayed normally on the output window for the GUI is now displayed on the command prompt.

Figure 3: Running a performance test using the command prompt

Preprocessing Appendix

1. **No Action Filter** - Filters out all cases that have no action performed by the agent;
2. **Feature Distance Presort** - Changes the case bases so all features are sorted by the distance where the closest objects are first in the list;
3. **Sequential Backward Generation** - Replaces the weights with the highest evaluation weights selected from the all possible configurations of the feature set;
4. **Zero Weight Filter** - Filters out zero weighted features from all the cases
5. **Rough Set Features Selection** - Adjust the weights to achieve the best results similar to Sequential Backward Generation but only of the core features and it does not run an in-depth search.