Running a Problem with Portfolio Safeguard (PSG) in Run-File (Text) Environment

Problems are presented in PSG Run-File (Text) Environment. To optimize a problem you should install PSG on your PC. Go to PSG website http://www.aorda.com/aod and click on the button "Request a Trial" to request a trial version of PSG. After filling the form you will get a client account at American Optimal Decisions (AOD) website. Following the instructions provided by AOD Support you will have an access to the PSG installation file at the client website. After PSG installation you can run problems in PSG Run-File environment.

To optimize a problem in Run-File environment you should prepare a problem in File Format: 1) download the "Problem Statement" file to some directory; 2) download "Data" file to the same directory.

Here is information how to run MAX_RISK problem which is located in the example the PSG directory …\American Optimal Decisions\PSG\MATLAB\ExampleMaxRisk_StDev .
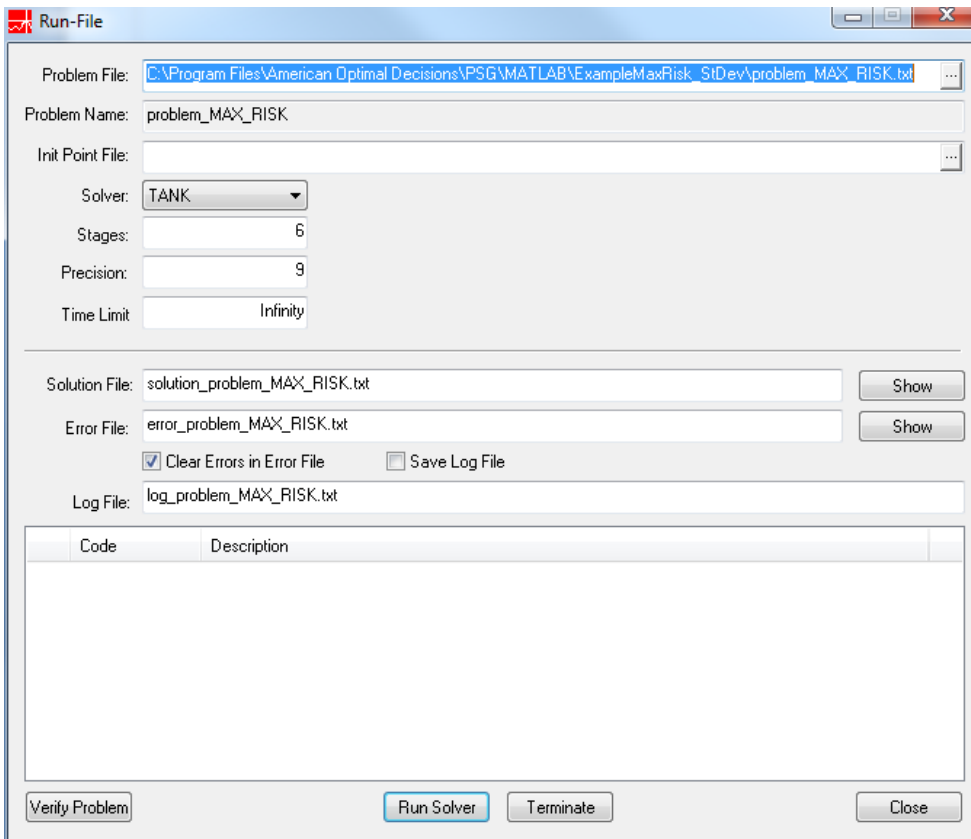
The "Run-File" code can be started as a usual windows application:
"Start" -> "All Programs" -> "American Optimal Decisions" -> "Portfolio Safeguard" -> "Run-File".

The following "Run-File" screen appears.
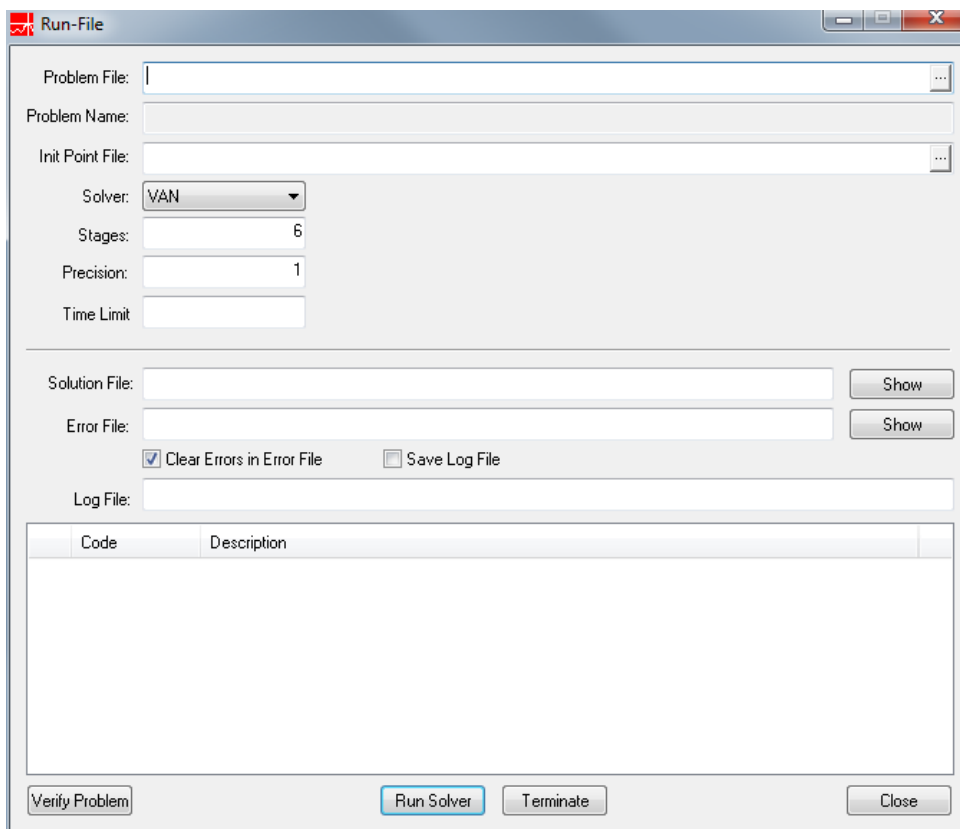
- Click on "Problem File" button and choose the file with the "Problem Statement" ("problem_MAX_RISK.txt" in the following picture).

Parameters extracted from the "Problem Statement" file are in the fields "Problem name", "Solver", and "Accuracy". Default parameters appear in the fields "Stages", "Time Limit", "Solution File", "Error File", and "Log File".

- Click on **"Run Solver"** button to solve the optimization problem.
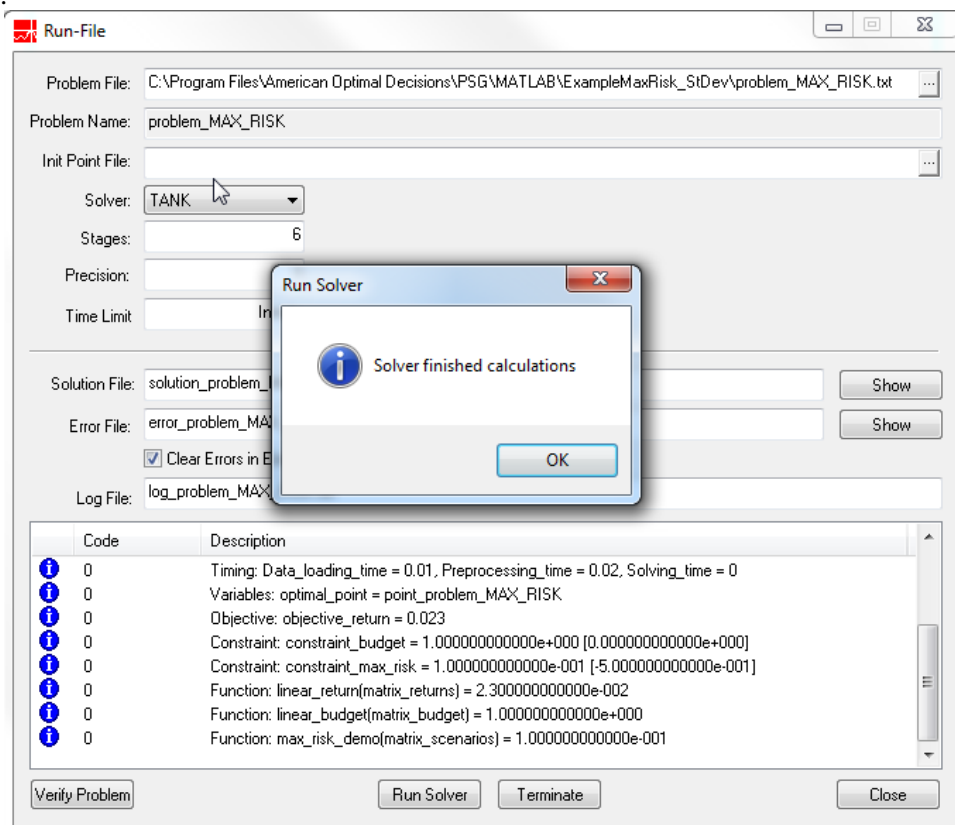
- Click **OK** to close the "Solver finished calculations" message.

The file describing the solution is created in the same directory where there is the "Problem Statement" file. To view this file click on the "Show" button of the Solution File field. The solution file is opened by the default text editor:
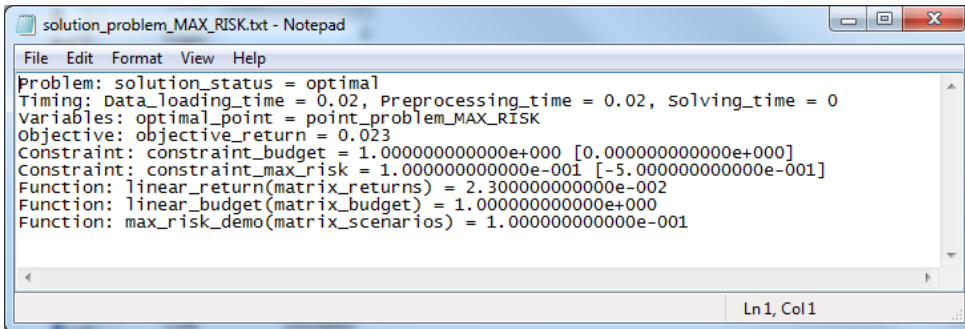
- Click **Close** to close the "Run-File" applications.

Alternatively, you can open the solution file manually.
- Open the file specified in the field "Solution File" (in folder containing problem data).

```
Problem: solution_status = optimal
Timing: Data_loading_time = 0.01, Preprocessing_time = 0.02, Solving_time = 0
Variables: optimal_point = point_problem_MAX_RISK
Objective: objective_return = 0.023
Constraint: constraint_budget = 1.000000000000e+000 [0.000000000000e+000]
Constraint: constraint_max_risk = 1.000000000000e-001 [-5.000000000000e-001]
Function: linear_return(matrix_returns) = 2.300000000000e-002
Function: linear_budget(matrix_budget) = 1.000000000000e+000
Function: max_risk_demo(matrix_scenarios) = 1.000000000000e-001
```

Here:
- Status of optimization is "optimal";
- Solver calculation time "Solving_time = 0.0" meaning that the problem was solved in time less than 1 second, data loading time "Data_loading_time = 0.12" , and preprocessing time "Preprocessing_time = 0.02".
- Optimal values for decision variables are in the file point_problem_MAX_RISK.
- Values of objective, constraints, and functions on the optimal point.

To view the optimal point for the problem "problem_MAX_RISK" open the file "point_problem_MAX_RISK":

```
Component_name    Value
     b1     1.000000000000e-001
     b2     9.000000000000e-001
```

The name of an error file is specified in the field "Error File". The error file (if any) is placed to the folder containing the "Problem Statement" file.