**Instruction for MOLTE-MCTS**

1. Modify MCTSProblems.xls file
2. Open and run MCTSInterface.m file

**Inputs**

**Inputs for MCTSProblem.xls (Sheet Path)**

Path – Should be set to directory that contains the folders ‘Pricing’, ‘Selling’, ‘TSP’, and ‘Utilities’

**Inputs for MCTSProblems.xls (Sheet Main)**

|  |  |  |
| --- | --- | --- |
| **Column** | **Description** | **Options** |
| Problem | The type of problems, see “Problems” sheet in Excel file | TSP, Selling, Pricing (In progress) |
| Type\* | Stochastic or deterministic version of the problem | S for Stochastic, D for Deterministic |
| Rollout Policy | Policy used to evaluate value of a node | See “Policies” sheet in Excel file+ |
| d\_thr | Number of decisions to sample | Integer |
| e\_thr | Number of observations to sample | Integer |
| alpha | Parameter for UCT | Real Number (Usually small, e.g. 0.5, 1, 1.5) |
| Budget | Number of iterations per MCTS call in the problem | Integer |

\*Only S is available for Pricing

+ LP and IP rollout policies requires GUROBI. Use can get around the requirements by using MATLAB’s linprog and intlinprog functions responsively, but expect at least 30% slower runtimes

**Problem Specific Inputs – Pricing**

|  |  |  |
| --- | --- | --- |
| **Column** | **Description** | **Options** |
| numExp | Number of experiments to run to learn the price | Integer |
| L | Number of steps to lookahead in rollout | Integer (less than numExp) |
| epsilon | Epsilon for epsilon-greedy rollout policy | [0 1] (0: pure exploitation <-> 1: pure exploration) |
| resolution | Size of discretization to compute differences between curves | The smaller the higher resolution |
| weight | Determines the whether the value of the node is biased towards revenue or information gain | [0 1] (0: max revenue <-> 1: max information gain) |

**Output**

Solution is stored in the struct **results**

|  |  |  |
| --- | --- | --- |
| **Field** | **Sub-Field** | **Description** |
| **bestSolution** |  | Best solution obtained from MCTS |
| **optSolution** |  | The exact solution for the deterministic problem |
| **time** |  | Time taken to solve problem |
|  | **decision** | The decisions made |
|  | **value** | Objective value or thetas in Pricing problem |