DM841

Discrete Optimization

## Lecture 5

# EasyLocal++

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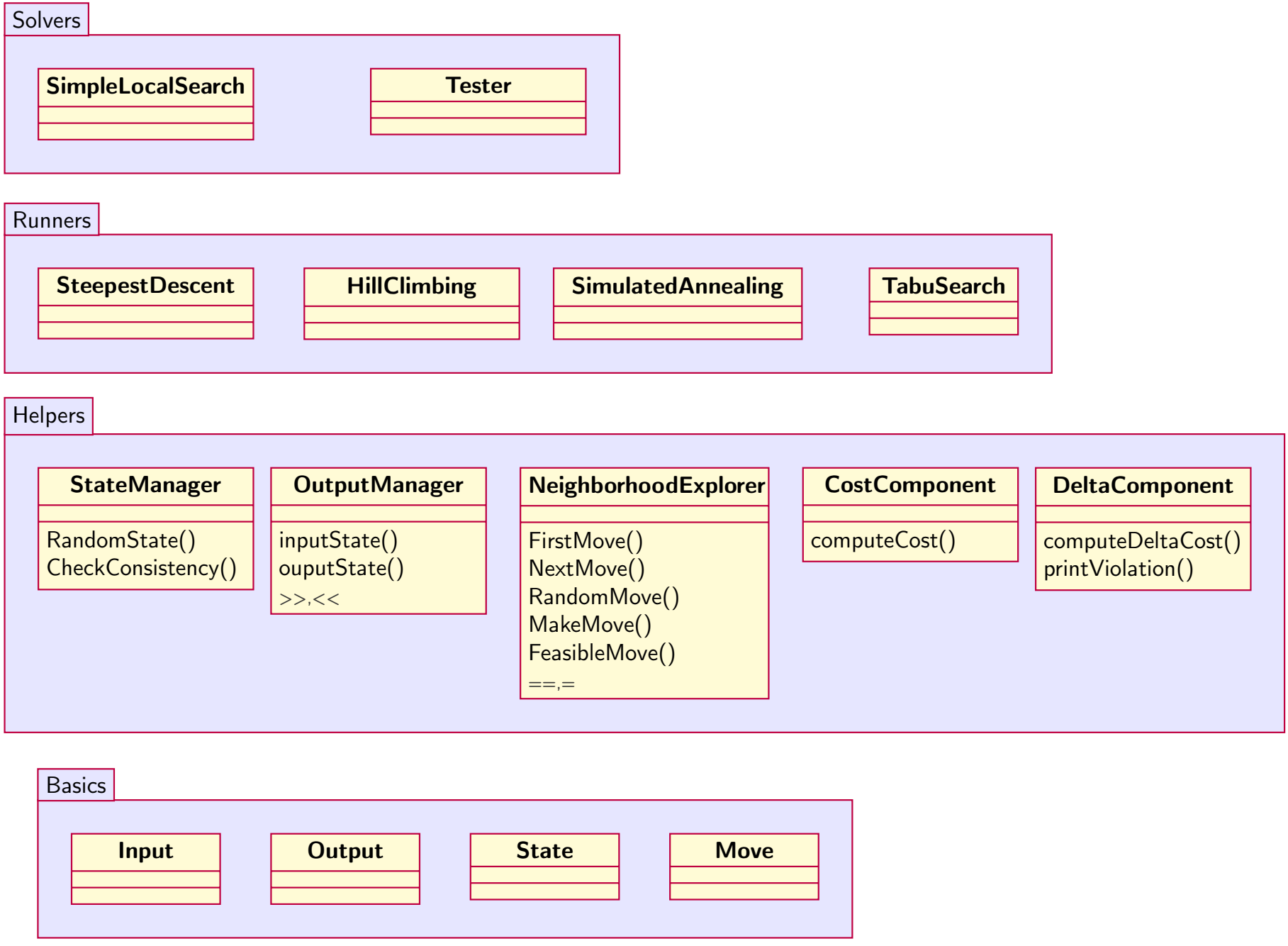
# Overview

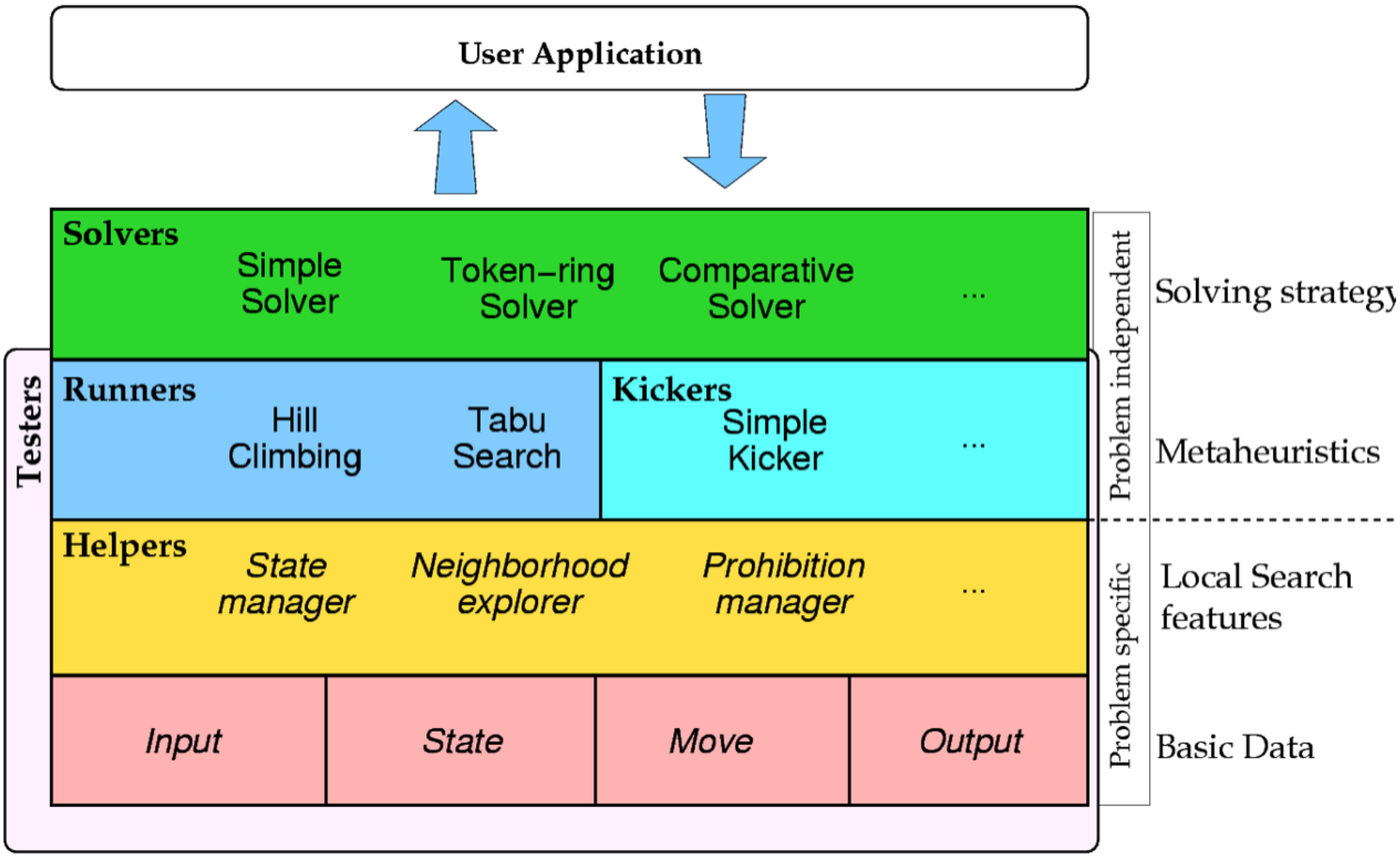
- Enumeration for N-Queens
- Enumeration for Bus Driver Scheduling
  - feasibility
  - optimizaiton (exploit order, bounds and pruning)
- Enumeration for optimization
- Easy Local: general view
- Easy Local for N-Queens

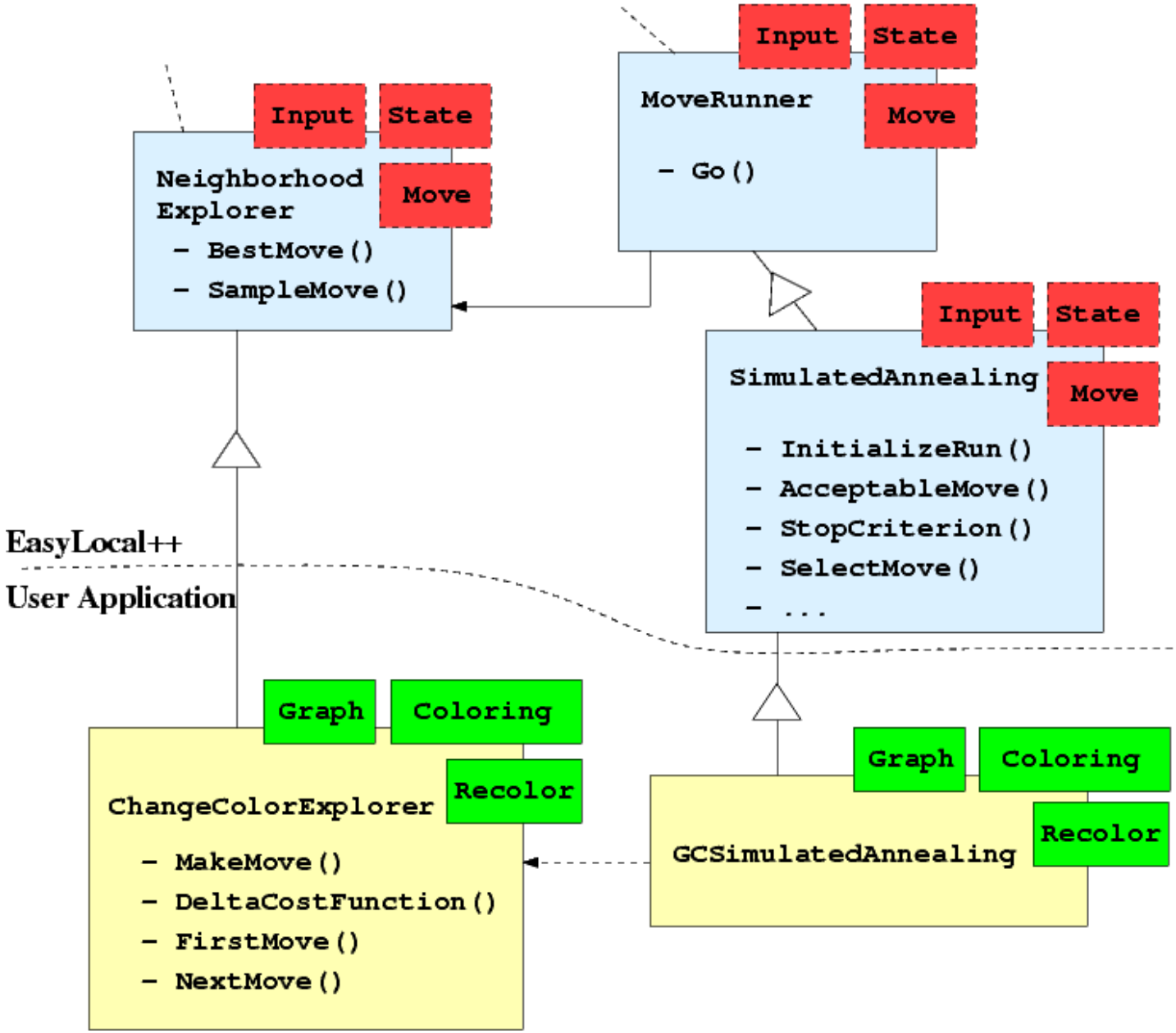
# Examples treated in class

- `BusDriver/InputOutput BusDriver/Instances`
- `EnumerationFramework/example`
- `Queens/Enumeration`
- `BusDriver/Enumeration`
- `BusDriver/EnumerationOpt`
- `Queens/LocalSearch`

Starting point for a new problem: `EL3SeedProject/`


Solvers
SimpleLocalSearch
Tester
Runners
SteepestDescent
HillClimbing
SimulatedAnnealing
TabuSearch
Helpers
StateManager
RandomState()
CheckConsistency()
OutputManager
inputState()
ouputState()
>>,<<
NeighborhoodExplorer
FirstMove()
NextMove()
RandomMove()
MakeMove()
FeasibleMove()
==,=
CostComponent
computeCost()
DeltaComponent
computeDeltaCost()
printViolation()
Basics
Input
Output
State
Move


User Application
Solvers
Simple Solver
Token–ring Solver
Comparative Solver
...
Runners
Hill Climbing
Tabu Search
Kickers
Simple Kicker
...
Helpers
State manager
Neighborhood explorer
Prohibition manager
...
Input
State
Move
Output
Testers
Problem independent
Problem specific
Solving strategy
Metaheuristics
Local Search features
Basic Data


Input
State
MoveRunner
Move
- Go()
Input
State
Neighborhood Explorer
Move
- BestMove()
- SampleMove()
Input
State
SimulatedAnnealing
Move
- InitializeRun()
- AcceptableMove()
- StopCriterion()
- SelectMove()
- ...
EasyLocal++
User Application
Graph
Coloring
ChangeColorExplorer
Recolor
- MakeMove()
- DeltaCostFunction()
- FirstMove()
- NextMove()
Graph
Coloring
GCSimulatedAnnealing
Recolor