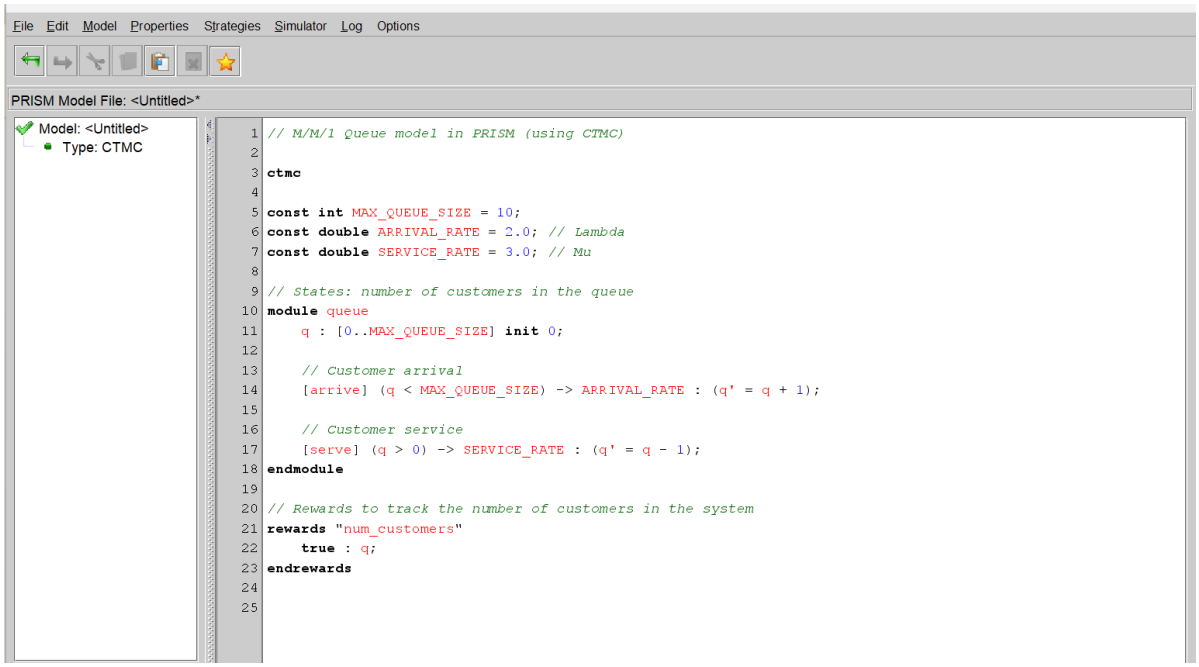
Verifying a Queueing Model with PRISM Model Checker

1.Modeling the Queueing System

PRISM model for an M/M/1 queue



2. Defining Properties

- Steady-state probability that the system is empty

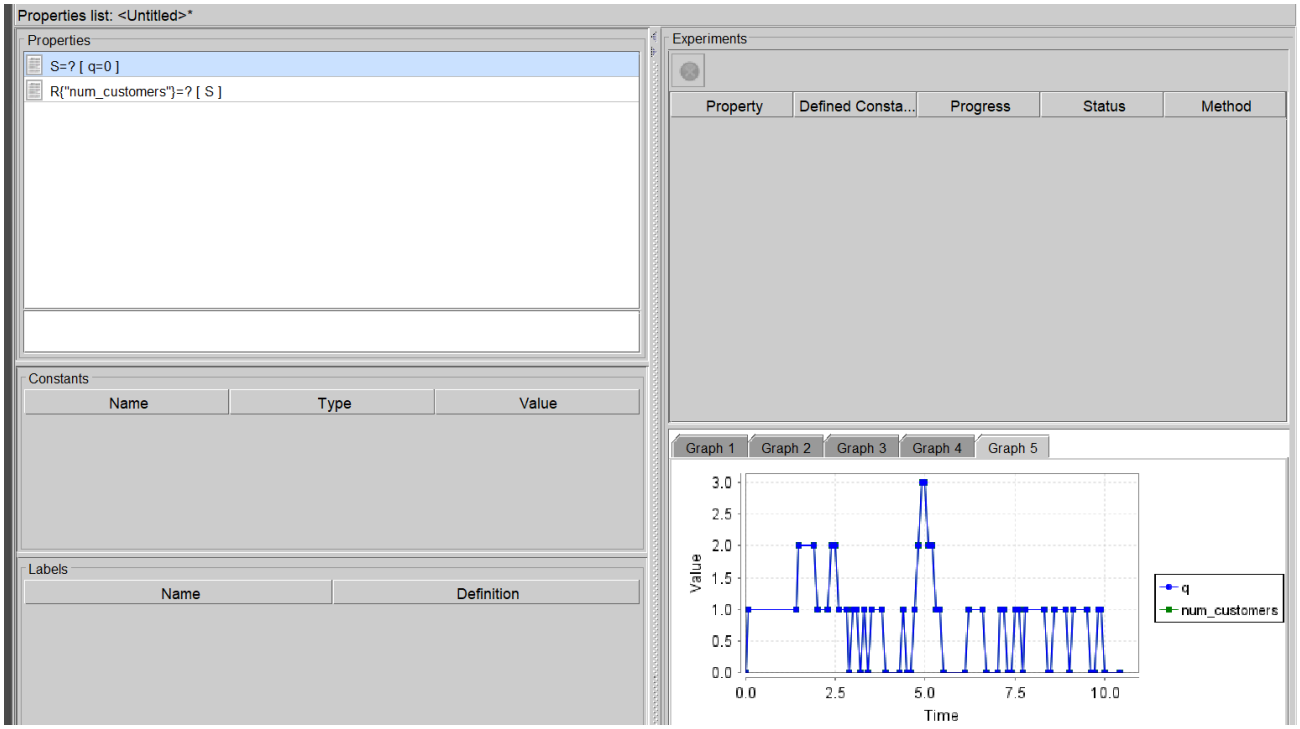
  S=? [q=0]

  property calculates the steady-state probability that the number of customers in the queue is zero.

- Expected number of customers in the queue

  R{"num_customers"}=? [S]

  property calculates the expected number of customers in the queue by using the reward structure defined in the model


Properties list: <Untitled>*
Properties
S=? [q=0]
R{"num_customers"}=? [S]
Constants
Name
Type
Value
Labels
Name
Definition
Experiments
Property
Defined Consta...
Progress
Status
Method
Graph 1
Graph 2
Graph 3
Graph 4
Graph 5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Value
0.0
2.5
5.0
7.5
10.0
Time
q
num_customers