List of Algorithms

Algorithm 1 Discrete Event Simulation

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1:  procedure DES(NumberofJobs, Load)
2:      λ ← Ratio · Load
3:      μ ← Ratio
4:      clock ← 0
5:      for i = 0 to NumberofJobs do
6:          ArrivalTime ← exponential(λ) + clock    ▷ Generate Random Num
7:          clock ← ArrivalTime
8:          job.PriorityTime ← ArrivalTime
9:          job.status ← Newjob
10:         Add job to queue
11:     end for
12:     while queue is not empty do
13:         Remove job from queue
14:         switch job.status do
15:             case Departure
16:                 Decrement number of jobs in server
17:                 Increment number of jobs served by server
18:                 Increment number of jobs in current server state
19:             case Newjob
20:                 Increment number of new jobs arrived
21:                 if current jobs in server equals server capacity then
22:                     job.status ← Oldjob
23:                     Add job to queue
24:                     Increment number of jobs in current server state
25:                     Increment number of jobs denied by server
26:                     currentServer ← nextServer                ▷ Round Robin
27:                 else
28:                     job.status ← Departure
29:                     job.id ← server.id
30:                     ServerTime ← exponential(μ) ▷ Generate Random Num
31:                     job.PriorityTime ← job.PriorityTime + ServerTime
32:                     Add job to queue
33:                     Increment number of jobs in server
34:                     Increment number of jobs in current server state
35:                     currentServer ← nextServer                ▷ Round Robin
36:                 end if
37:             case Oldjob
38:                 Increment number of servers visited by job
39:                 Increment number of old jobs arrived at current server
40:                 if number of servers visited by job > number of servers then
41:                     Increment number of dropped jobs
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42:                 else
43:                     if current jobs in server equals server capacity then
44:                         Add job to queue
45:                         Increment number of jobs in current server state
46:                         Increment number of jobs denied by server
47:                         currentServer ← nextServer                ▷ Round Robin
48:                     else
49:                         job.status ← Departure
50:                         job.id ← server.id
51:                         ServerTime ← exponential(μ)    ▷ Generate Random
    Num
52:                         job.PriorityTime ← job.PriorityTime + ServerTime
53:                         Add job to queue
54:                         Increment number of jobs in server
55:                         Increment number of jobs in current server state
56:                         currentServer ← nextServer                ▷ Round Robin
57:                     end if
58:                 end if
59:     end while
60:     expected value = η Σ_{n=0}^{N} n · S_i                ▷ N = Number of States
61:     return expected value
62: end procedure
```