Performance Modeling
of Computer Systems and Networks

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Next Event Simulation
Exercises

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```
utilization ............. =   0.75
[iMac-di-mac-2:DEScodeAle mac$ ./uvs <uvs.dat

for a sample of size 1000
mean ................. =    3.042
standard deviation ... =    1.693
minimum .............. =    0.207
maximum .............. =   11.219
```

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r=2 sec, s=1.5 sec
Interr stream 0, servizi stream 2, seed 123456789

Interarrivi e servizi esponenziali :   interarrivi e servizi iperesponenziali p=0.01:

```
arrival time =    0.11          arrival time =    0.11
service time =    0.72          service time =    0.38
arrival time =    0.39          arrival time =    0.39
service time =    0.69          service time =    2.45
arrival time =    2.86          arrival time =    2.86
service time =    0.86          service time =    1.79
arrival time =    3.59          arrival time =    3.59
service time =    4.40          service time =    2.82
arrival time =    7.51          arrival time =    7.51
service time =    0.56          service time =    0.05
arrival time =    7.80          arrival time =    7.80
service time =    3.22          service time =    0.23
arrival time =    9.99          arrival time =    9.99
service time =    1.35          service time =    0.47
arrival time =   11.82          arrival time =   11.82
service time =    5.07          service time =    0.00
arrival time =   22.34          arrival time =   22.34
service time =    1.47          service time =    0.00
arrival time =   26.10          arrival time =   26.10
service time =    0.09          service time =    2.11
```

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---

seed 123456789

stream 0 for arrivals expo(2), stream 1 for services uniform(1,2),

for 10025 jobs
average interarrival time =   1.99
average wait .... =   3.92
average delay .... =   2.41
average service time .... =   1.50
average # in the node ... =   1.96
average # in the queue .. =   1.21
utilization .... =   0.75

Theoretical values

$\bar{r}$	$\bar{w}$	$\bar{d}$	$\bar{s}$	$\bar{l}$	$\bar{q}$	$\bar{x}$
2.00	3.83	2.33	1.50	1.92	1.17	0.75

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```
seed 123456789
   stream 0 for arrivals expo(2), stream 1 for services expo(1,5)

  for 10025 jobs
     average interarrival time =    1.99
     average wait ........... =    5.79
     average delay .......... =    4.29
     average service time .... =    1.50
     average # in the node ... =    2.90
     average # in the queue .. =    2.15
     utilization ............. =    0.75

 stream 0 for arrivals expo(2), stream 1 for services hyperexpo(1.5,0.01)

  for 10025 jobs
     average interarrival time =    1.99
     average wait ........... =   73.30
     average delay .......... =   71.83
     average service time .... =    1.47
     average # in the node ... =   35.20
     average # in the queue .. =   34.49
     utilization ............. =    0.71
```

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```
seed 123456789
   stream 0 for arrivals expo(2), stream 1 for services expo(1,5)

  for 10025 jobs
     average interarrival time =    1.99
     average wait ........... =    5.79
     average delay .......... =    4.29
     average service time .... =    1.50
     average # in the node ... =    2.90
     average # in the queue .. =    2.15
     utilization ............. =    0.75

 stream 0 for arrivals expo(2), stream 1 for services hyperexpo(1.5,0.1)

  for 10025 jobs
     average interarrival time =    1.99
     average wait ........... =   13.33
     average delay .......... =   11.82
     average service time .... =    1.51
     average # in the node ... =    6.68
     average # in the queue .. =    5.92
     utilization ............. =    0.76
```

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3

```
seed 123456789
   stream 0 for arrivals expo(2), stream 1 for services expo(1,5)

  for 10025 jobs
     average interarrival time =   1.99
     average wait ........... =   5.79
     average delay .......... =   4.29
     average service time .... =   1.50
     average # in the node ... =   2.90
     average # in the queue .. =   2.15
     utilization ............. =   0.75

 stream 0 for arrivals expo(2), stream 1 for services hyperexpo(1.5,0.5)

   for 10025 jobs
      average interarrival time =   1.99
      average wait ........... =   6.73
      average delay .......... =   5.20
      average service time .... =   1.53
      average # in the node ... =   3.37
      average # in the queue .. =   2.60
      utilization ............. =   0.77
```

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