

Example 1:

In a mobile handset manufacturing factory, components arrive with a Poisson distribution at the rate of 6 components per 100 seconds. Assume that the time for testing the component takes any random time from 5 to 15 seconds, per component. It is assumed that the system can accommodate at most 15 components. Determine the measures of effectiveness.

Solution:

In the given situation, the components arrive as a Poisson process with rate 0.06/sec and are processed in the time duration following uniform distribution over [5,15]. Hence the system is and $M/G/1/15$ queue. In order to obtain the measures of effectiveness, we follow the steps as shown below:

- Open the page where the experimentation is to be performed
- Feed the data as shown:

$M/G/1/N$, $G/M/1/N$, $G/G/1/N$



Start Reset

☒ M ☐ G

Arrival Distribution : Uniform

Parameters : .06

☐ M ☒ G

Departure Distribution : Uniform

Parameters : 5 15

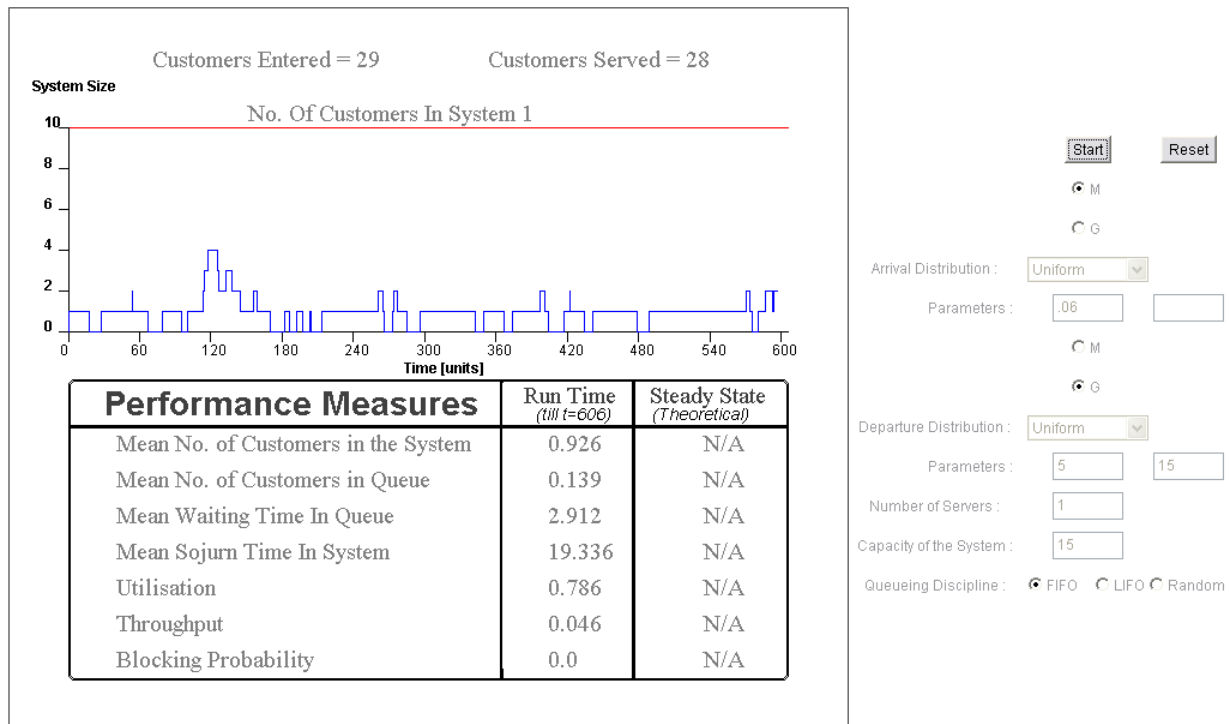
Number of Servers : 1

Capacity of the System : 15

Queueing Discipline : ☒ FIFO ☐ LIFO ☐ Random

Virtual Lab @ IITD

- Next, click on the **‘Start’** button to obtain the desired measures of effectiveness



Virtual Lab @ IITD

Example 2:

In a mobile handset manufacturing factory, a component arrives for testing every 3 seconds. It is assumed that the time for testing the component is exponentially distributed with parameter 4. It is assumed that the system can accommodate atmost 15 components. Determine the measures of effectiveness.

Solution:

In the given situation, the components arrive at a fixed time interval of 3 seconds and is tested at the rate of 4 components per second. Hence the system is and $G/M/1/15$ queue. In order to obtain the measures of effectiveness, we follow the steps as shown below:

- Open the page where the experimentation is to be performed
- Feed the data as shown:

Start
Reset

☐ M
 ☒ G

Arrival Distribution : Deterministic

Parameters : 3

☒ M
 ☐ G

Departure Distribution : Uniform

Parameters : 4 15

Number of Servers : 1

Capacity of the System : 15

Queueing Discipline : ☒ FIFO ☐ LIFO ☐ Random

Virtual Lab @ IITD

➤ Next, click on the ‘**Start**’ button to obtain the desired measures of effectiveness

Customers Entered = 14 Customers Served = 13

No. Of Customers In System 1

Performance Measures	Run Time (till t=43)	Steady State (Theoretical)
Mean No. of Customers in the System	0.903	N/A
Mean No. of Customers in Queue	0.0	N/A
Mean Waiting Time In Queue	0.0	N/A
Mean Sojourn Time In System	2.71	N/A
Utilisation	0.903	N/A
Throughput	0.309	N/A
Blocking Probability	0.0	N/A

Start
Reset

☐ M
 ☒ G

Arrival Distribution : Deterministic

Parameters : 3

☒ M
 ☐ G

Departure Distribution : Uniform

Parameters : 4 15

Number of Servers : 1

Capacity of the System : 15

Queueing Discipline : ☒ FIFO ☐ LIFO ☐ Random

Virtual Lab @ IITD

Example 3:

In a mobile handset manufacturing factory, a component arrives for testing every 10 mins. It is assumed that the time for testing the component takes any random time from 5 to 15 mins, per component. It is assumed that the system can accommodate atmost 15 components. Determine the measures of effectiveness.

Solution:

In the given situation, the components arrive at a fixed time interval of 10 minutes. The time for testing is uniformly distributed between 5 to 15 mins. Hence the system is and $G/G/1/15$ queue. In order to obtain the measures of effectiveness, we follow the steps as shown below:

- Open the page where the experimentation is to be performed
- Feed the data as shown:

$M/G/1/N$, $G/M/1/N$, $G/G/1/N$



Start Reset

☐ M
☒ G

Arrival Distribution : Deterministic

Parameters : 10

☐ M
☒ G

Departure Distribution : Uniform

Parameters : 5 15

Number of Servers : 1

Capacity of the System : 15

Queueing Discipline : ☒ FIFO ☐ LIFO ☐ Random

Virtual Lab @ IITD

- Next, click on the '**Start**' button to obtain the desired measures of effectiveness

