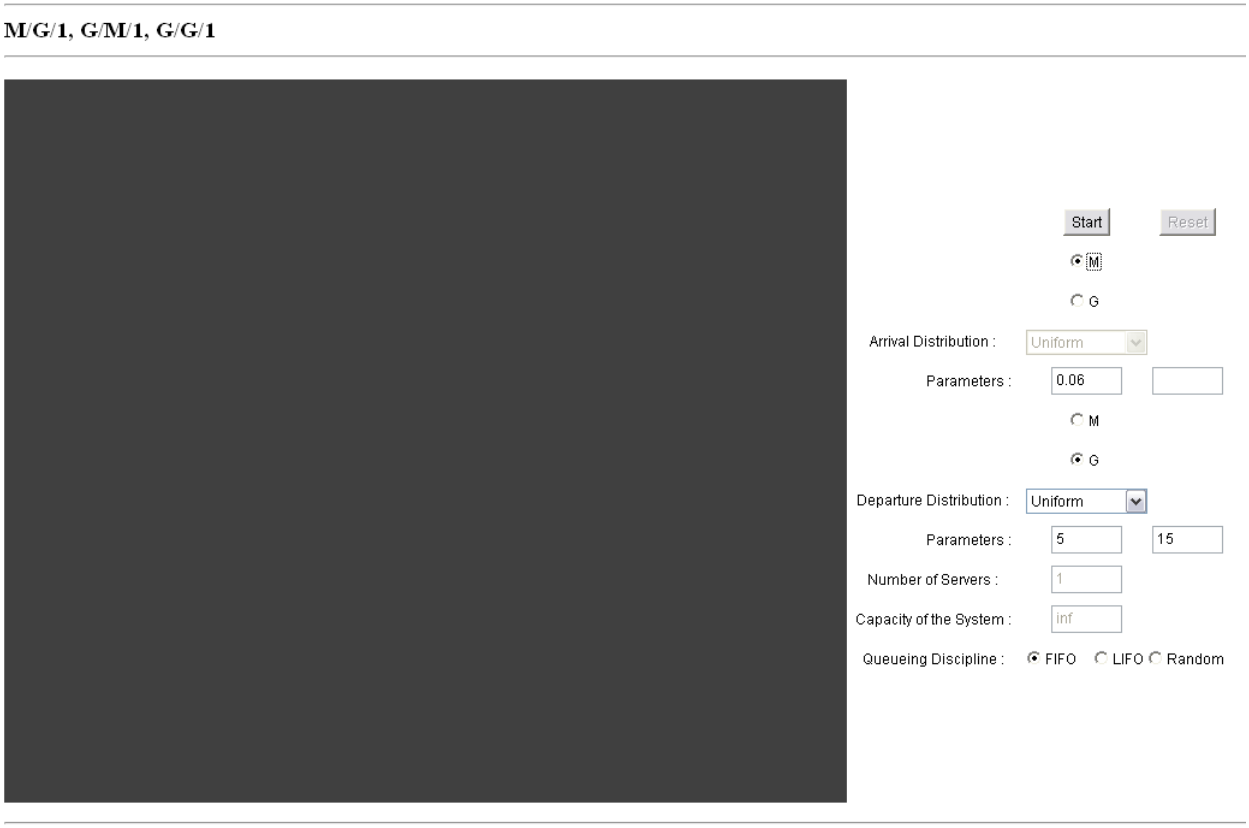
Example 1:

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. Determine the measures of effectiveness.

Solution:

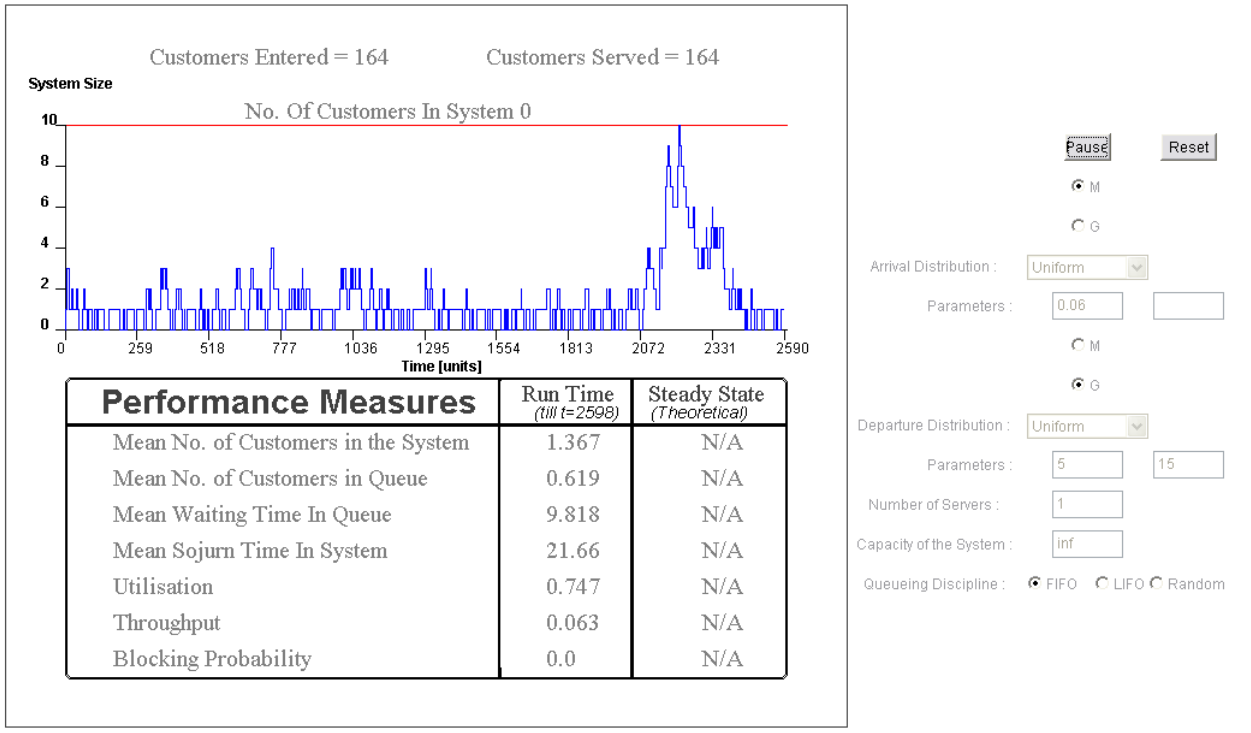
In the given situation, the components arrive as a Poisson process with rate 0.06/sec and are processed in the time duration following uniform distribution over [5,15]. Hence the system is and $M/G/1$ queue. In order to obtain the measures of effectiveness, we follow the steps as shown below:

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



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

M/G/1, G/M/1, G/G/1



Performance Measures	Run Time (till t=2598)	Steady State (Theoretical)
Mean No. of Customers in the System	1.367	N/A
Mean No. of Customers in Queue	0.619	N/A
Mean Waiting Time In Queue	9.818	N/A
Mean Sojurn Time In System	21.66	N/A
Utilisation	0.747	N/A
Throughput	0.063	N/A
Blocking Probability	0.0	N/A

Virtual Lab @ IITD

- In the simulator we can choose the queuing discipline to be either **FIFO, LIFO or Random**

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. Determine the measures of effectiveness.

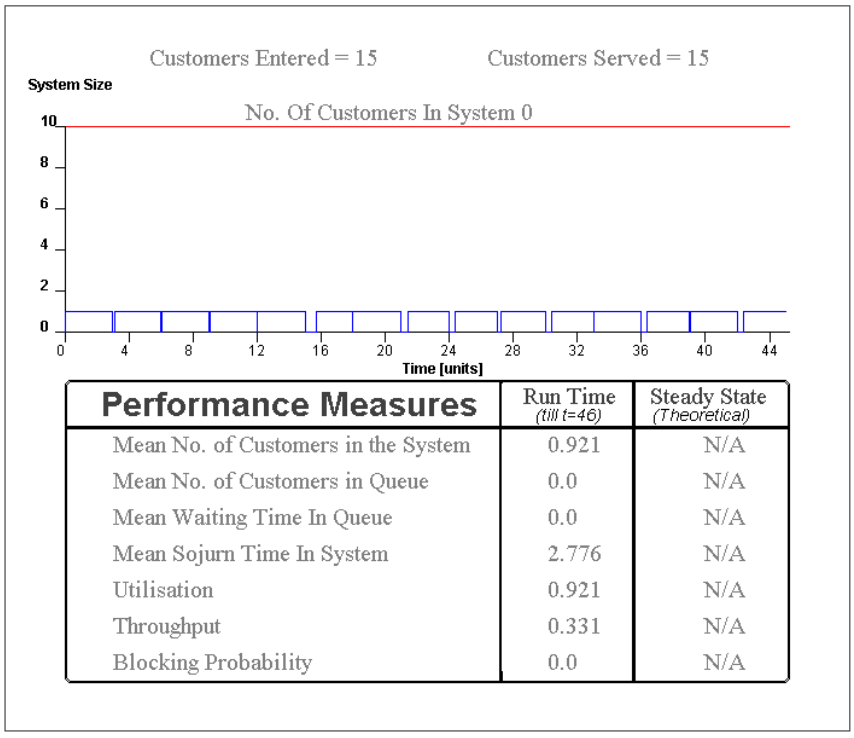
Solution:

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 $G/M/1$ 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:

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

M/G/1, G/M/1, G/G/1



Performance Measures	Run Time (till t=46)	Steady State (Theoretical)
Mean No. of Customers in the System	0.921	N/A
Mean No. of Customers in Queue	0.0	N/A
Mean Waiting Time In Queue	0.0	N/A
Mean Sojurn Time In System	2.776	N/A
Utilisation	0.921	N/A
Throughput	0.331	N/A
Blocking Probability	0.0	N/A

Virtual Lab @ IITD

- In the simulator we can choose the queuing discipline to be either **FIFO, LIFO or Random**

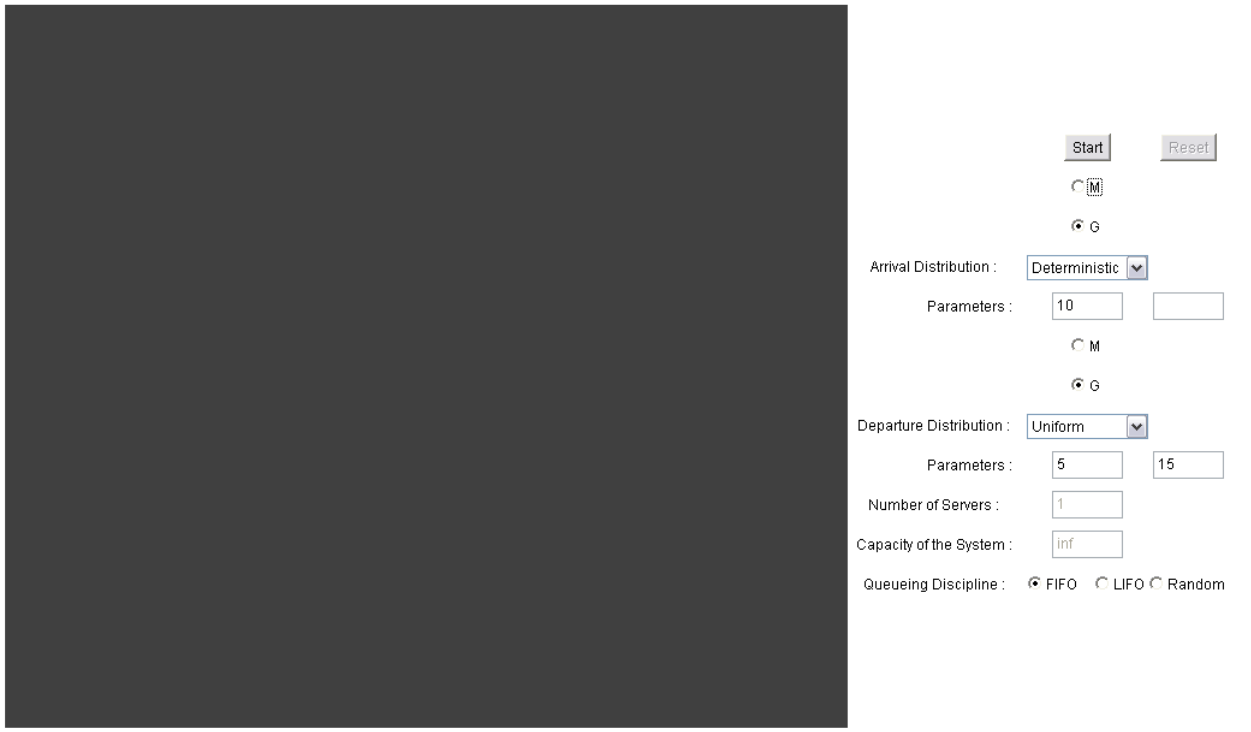
Example 3:

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. Determine the measures of effectiveness.

Solution:

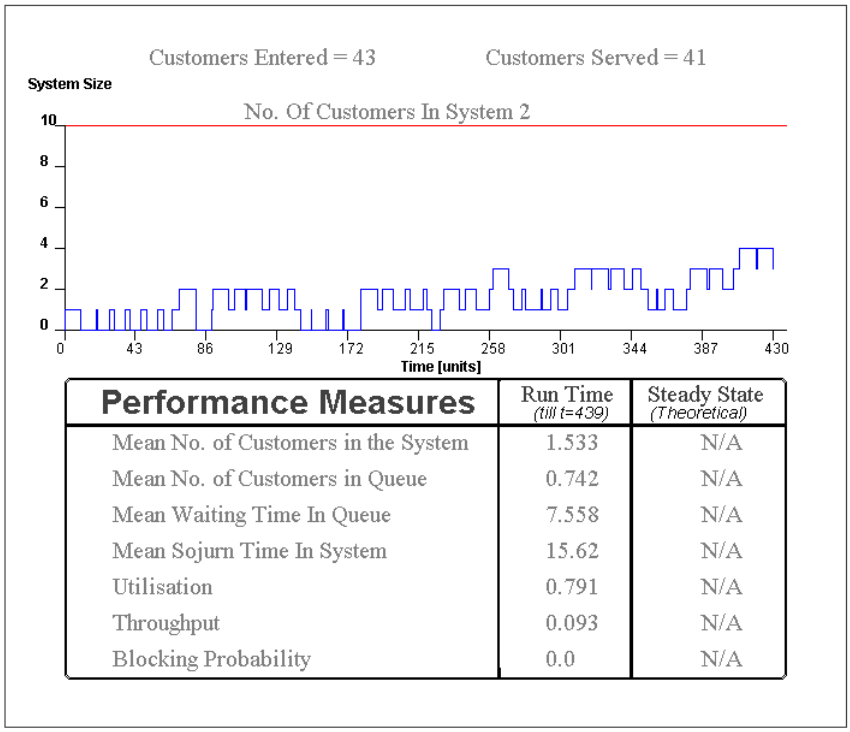
In the given situation, the components arrive at a fixed time interval of 10 minutes. The time for testing is uniformly distributed between 5 to 15 mins. Hence the system is and $G/G/1$ queue. In order to obtain the measures of effectiveness, we follow the steps as shown below:

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

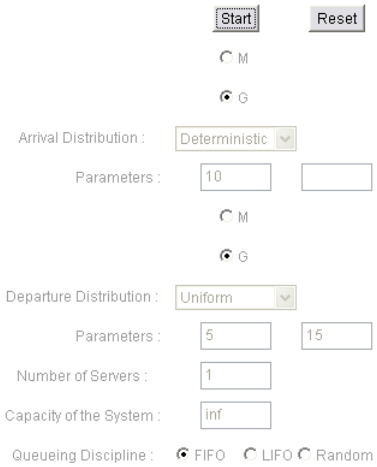


- Next, click on the **'Start'** button to obtain the desired measures of effectiveness

M/G/1, G/M/1, G/G/1



Performance Measures	Run Time (till t=439)	Steady State (Theoretical)
Mean No. of Customers in the System	1.533	N/A
Mean No. of Customers in Queue	0.742	N/A
Mean Waiting Time In Queue	7.558	N/A
Mean Sojurn Time In System	15.62	N/A
Utilisation	0.791	N/A
Throughput	0.093	N/A
Blocking Probability	0.0	N/A



Virtual Lab @ IITD

- In the simulator we can choose the queuing discipline to be either **FIFO, LIFO or Random**