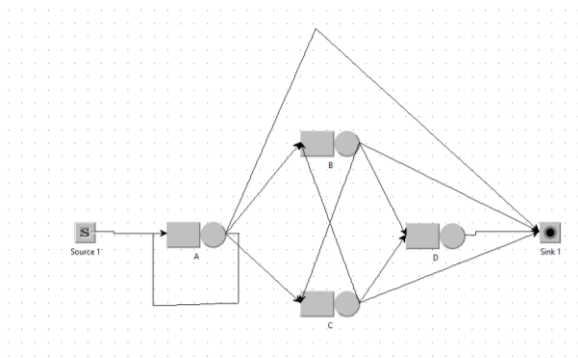
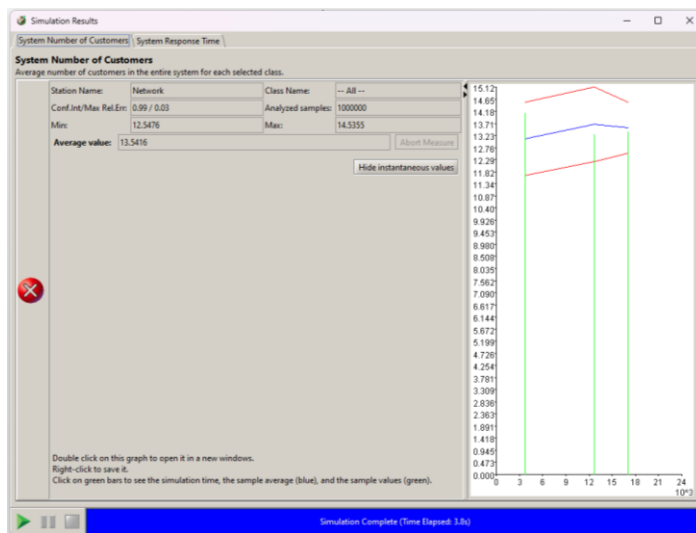


## 2. Construct the queueing network:

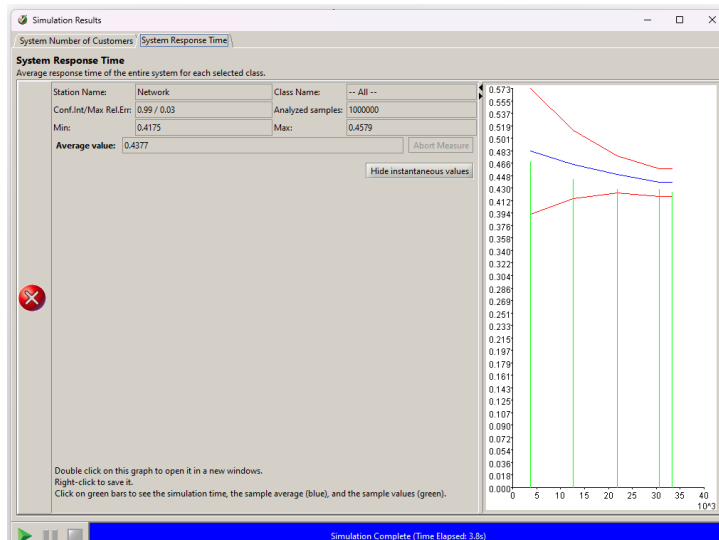


## Run the simulation:

- Simulated system number of customers (L): 13.5416 (Calculated: 13.357)
- Reference: Second trial 13.471

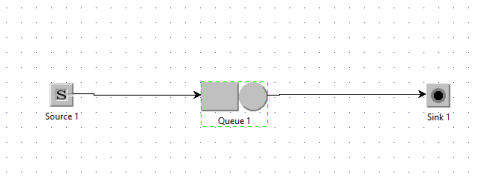


- Simulated system response time (W): 0.4377 (Calculated: 0.445)
- Reference: Second Trial: 0.486



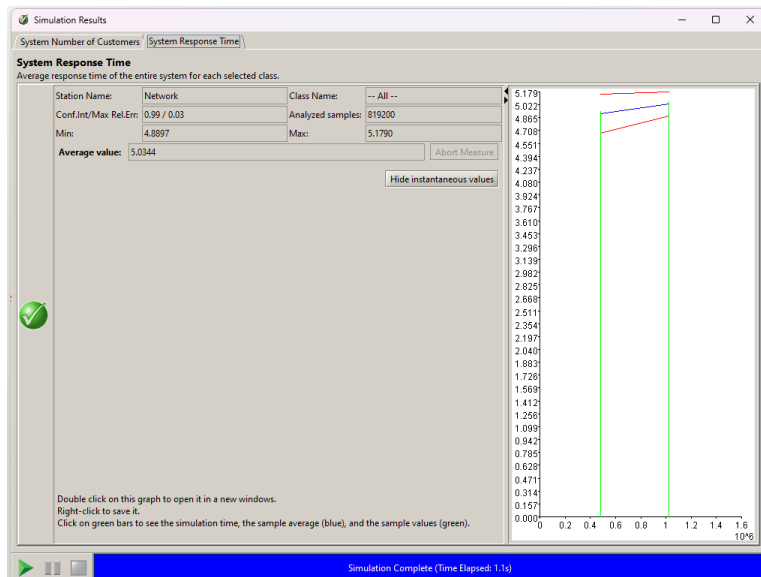
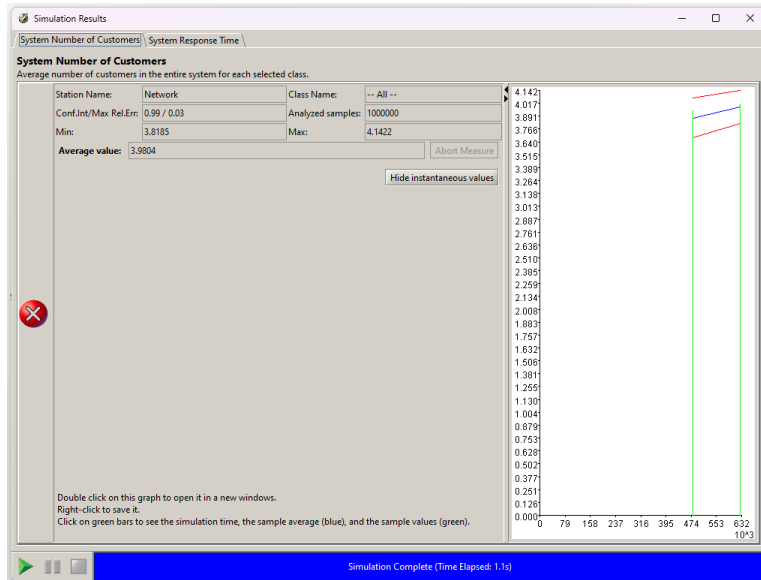
## 3. (ii)

## Construct the model:



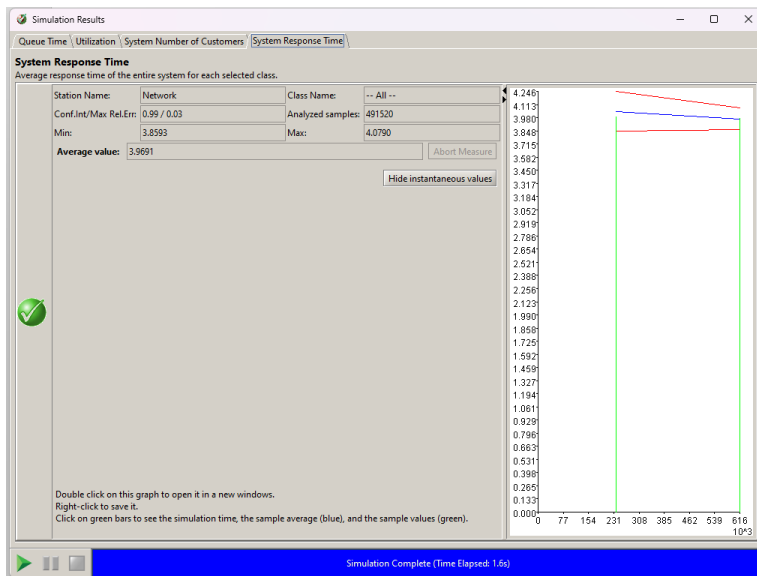
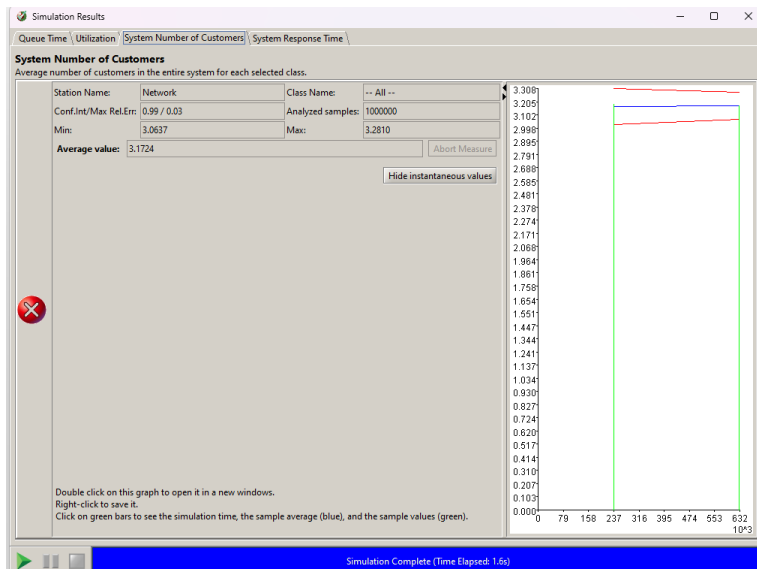
For M/M/1:

- Simulated system number of customers (L): 3.9804 (Calculated: 4)
- Simulated system response time (W): 5.0344 (Calculated: 5)



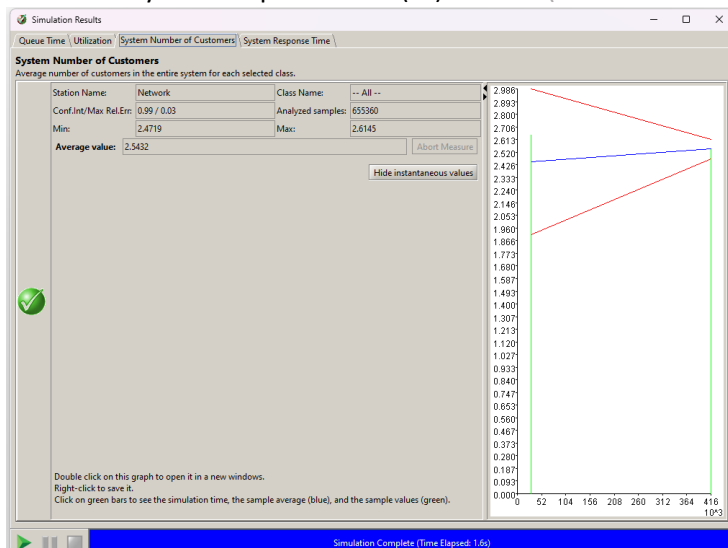
For M/E<sub>2</sub>/1:

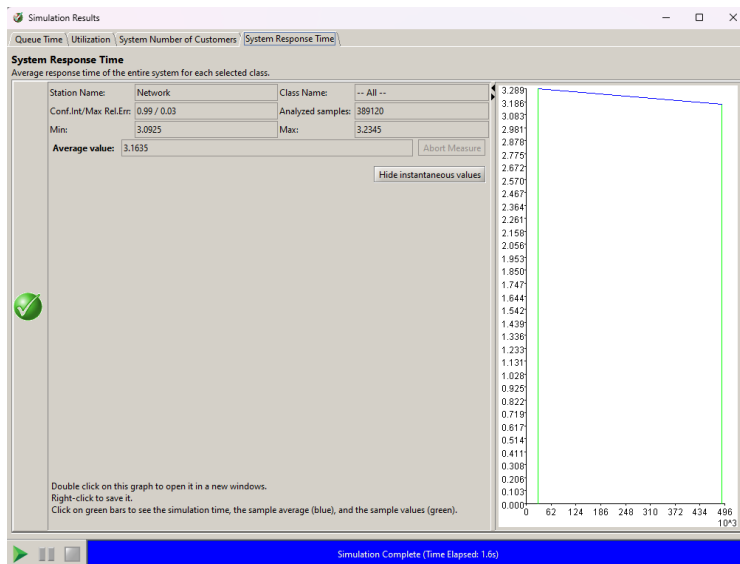
- Set the service time distribution to Erlang-k:  $\lambda$ (each stage)=2, k=2, such that mean service rate  $\mu=1$
- Simulated system number of customers (L): 3.1724 (Calculated: 3.2)
- Simulated system response time (W): 3.9691 (Calculated: 4)



For  $M/E_{10}/1$ :

- Set the service time distribution to Erlang-k:  $\lambda$ (each stage)=10,  $k=10$ , such that mean service rate  $\mu=1$
- Simulated system number of customers (L): 2.5432 (Calculated: 2.56)
- Simulated system response time (W): 3.1635 (Calculated: 3.2)





For M/D/1:

- Set the service distribution to deterministic with service rate  $\mu=1$
- Simulated system number of customers (L): 2.4471 (Calculated: 2.4)
- Simulated system response time (W): 3.0371 (Calculated: 3)

