END3032 – SYSTEMS SIMULATION

THE PREVENTIVE MAINTENANCE PROBLEM

Laboratory Practice #7

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Problem Definition

In a machine shop, two types of discs are produced as Disc A and Disc B. They arrive on average every **5** and **10 minutes** according to the **exponential distribution**, respectively. From the input queue, Disc A is sent to the lathe and this operation is **normally** distributed with a mean of **5 minutes** and a standard deviation of **1 minute**. Disk B is sent to the mill and it takes **uniformly (6, 2) minutes**. After turning (milling), Disk A (B) is sent to the inspection station and the inspection takes **normally (6, 2) minutes**. After inspection, **30 percent** of the parts are sent back to the input queue for rework. The remaining, **70 percent**, pass the inspection. Consider a material handling time of **1 minute** between each process and the process times for rework are the same as their standard process times.

Preventive maintenance is carried out on both turning and milling machines. The lathe machine is down for preventive maintenance every 120 minutes and maintenance takes **normally (10, 2) minutes**. The milling machine is down for preventive maintenance every 200 minutes. Maintenance takes minimum **10**, mode of **15**, and maximum of **20 minutes** according to a **triangular distribution**.

Make a simulation model and estimate the utilization of each machine. Run the simulation model for 5 days (40 hours).