

## ITM529. Stochastic Processes

Short Quiz 2, 2025F, Weighting of 5%

Solution

Name: [ ]

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#1. We want to decide whether to employ a human operator or buy a machine to paint steel beams with a rust inhibitor. Steel beams are produced at a constant rate of one every 14 minutes. A skilled human operator takes an average time of 700 seconds to paint a steel beam, with a standard deviation of 300 seconds. An automatic painter takes on average 40 seconds more than the human painter to paint a beam, but with a standard deviation of only 150 seconds. Which system is better and why? [5pt]

After waiting time for each system is obtained, the following conclusion is expected. Machine is better, because it has less queue time and less queue size in the long run. Machine is slower on average, but it has less variation, hence better in overall performance.

**Difficulty: Easy**

**Amount of work: 100%**