

Homework 8

(80 points)

Part 1 - Scheduling with RM and DM

1. Prove that the density test is not a sufficient test for RM. Clearly state your reasoning. (15 points)
2. Draw the schedule produced by RM for Lehoczky's counterexample. State the completion time of each job.
Lehoczky's counterexample: (T, C): (70, 26), (100, 62) (12 points)
3. Explain what Lehoczky's counterexample shows. (4 points)
4. Apply the General TDA approach to the following task system. For each task, clearly indicate which part of the test you are using.
(T, C, D): (18, 3, 16), (35, 7, 35), (50, 31, 58) (25 points)

Part 2 - Reading Questions

Read the abstract, introduction, and conclusion of the paper. Also, within the Event-Triggered Systems and Time-Triggered Systems sections, read the initial description and the Scheduling Strategy sections (skipping the Flow Control, Communication Protocols, and Replica Determinism subsections). Then read the Comparative Evaluation section.

1. Which approach is more typically used for a safety-critical system? (4 points)
2. Summarize how scheduling is done for TT-systems. How does this differ from how scheduling is done for ET-systems? (6 points)
3. What is the challenge of testing ET-systems? (6 points)
4. How does the process of adding or changing a task differ between ET-systems and TT-systems? (6 points)
5. What is one question that you have after doing this reading? (2 points)

Feedback

1. How much time did you spend completing this assignment (ignoring interruptions)?
2. How much time did you spend doing the assigned reading (ignoring interruptions)?
3. Any other feedback?