CS314: Lecture Note (Lecture #29, April 27, 2023)

The agenda for CS314 lecture #29 (April 27, 2023):

1. Attendance cards
2. Quiz #10 has been graded
3. Exercise on April 27, 2023
4. RMS (Rate-Monotonic Scheduling)
5. Priority Inversion
   - A case study: Mars Pathfinder Priority Inversion
6. Exercise on April 25, 2023:

   CS314 Operating System
   Spring 2023
   Exercise Question on April 25, 2023

Prove that the following condition is not "a necessary and sufficient condition (for "feasibility test")" for RMS real-time scheduling.

\[
\frac{C_1}{T_1} + \frac{C_2}{T_2} + \ldots + \frac{C_n}{T_n} \leq n(2^\frac{1}{n} - 1)
\]  

(1)

where:

- \( C_i \) is the execution time of task \( i \)
- \( T_i \) is the task's time period for task \( i \)
- \( n \) is the number of tasks

Note 1: all the tasks are periodic tasks (tasks that repeat its pattern).

Note 2: Use APPENDIX (at the end of this exam) for formula (1).

APPENDIX:

<table>
<thead>
<tr>
<th>N</th>
<th>N(2^(\text{N-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
</tr>
<tr>
<td>2</td>
<td>0.828</td>
</tr>
<tr>
<td>3</td>
<td>0.779</td>
</tr>
<tr>
<td>4</td>
<td>0.756</td>
</tr>
<tr>
<td>5</td>
<td>0.743</td>
</tr>
<tr>
<td>6</td>
<td>0.734</td>
</tr>
<tr>
<td>( \infty )</td>
<td>0.693</td>
</tr>
</tbody>
</table>

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