Networked Embedded Systems Lab
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# Introduction to Embedded Systems – WS 2022/23

Exercise 2: Cyclic-Executive Scheduling

## Task 1: Feasibility

Given the task set and cyclic-executive schedule in Table 1, determine whether the cyclic-executive schedule is feasible. Determine the initial phase for each task such that the execution of each task instance finishes between its arrival and deadline. Note that the deadline should be after the frame in which the task instance executes, and the arrival should be before the frame in which the task instance executes.

| Task | Period | Deadline | Execution Time | Frames |
|---|---|---|---|---|
| 1 | 15 | 9 | 2 | 2, 5, 9, 12 |
| 2 | 12 | 4 | 3 | 1, 4, 7, 10, 13 |
| 3 | 10 | 6 | 1 | 1, 3, 6, 8, 11, 13 |
| 4 | 6 | 6 | 2 | 2, 3, 5, 6, 8, 9, 11, 12, 14, 15 |

Table 1: A task set and schedule

Use period $P = 60$ and frame length $f = 4$.

## Task 2: Manual Scheduling

Given the task set in Table 2, determine a feasible cyclic-executive schedule.

| Task | Period | Deadline | Execution Time |
|---|---|---|---|
| 1 | 15 | 3 | 3 |
| 2 | 10 | 5 | 3 |
| 3 | 6 | 6 | 3 |

Table 2: A task set and schedule

## Task 3: Bonus Practice

Given the task set in Table 3, determine a feasible cyclic-executive schedule.

| Task | Period | Deadline | Execution Time |
|---|---|---|---|
| 1 | 15 | 3 | 2 |
| 2 | 10 | 5 | 2 |
| 3 | 6 | 5 | 1 |
| 4 | 6 | 5 | 1 |

Table 3: A task set and schedule