**Clock-Driven Scheduling**

Frames and Major Cycles

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | FrameSz | |  |  |  |  |  |
| Task | Phase | pi | di | ei |  | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 1 | 0 | 4 | 4 | 1 |  | 0 | -5 | -6 | -9 | -8 | -13 | -14 |
| 2 | 0 | 6 | 6 | 2 |  | 0 | -3 | 0 | -7 | -8 | -9 | -12 |
| 3 | 0 | 8 | 8 | 3 |  | 4 | -1 | -2 | -5 | 0 | -9 | -10 |
| 4 | 0 | 12 | 12 | 4 |  | 8 | 3 | 6 | -1 | 0 | -3 | -6 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Problem - How do we know this is a feasible schedule? | | | | | |  |  |  |  |  |  |  |
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Requirements:

1) Every job has to start and finish within a frame - no pre-emption allowed within a frame

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2) The length of the cyclic schedule should be as short as possible. The frame size should be chosen so that it divides onto H

Note it may be possible to have more than one frame size.

⌊pi/*f*⌋ - pi/*f* = 0

To keep the length of the cyclic schedule as short as possible, the frame size *f* should be chosen so that it divides into *H.*

3) On the other hand, to make it possible for the scheduler to determine whether every job completes its by its deadline, we want the frame size to be sufficiently small sa that between the release time and the deadline of every job there is at least one frame.

This condition is met if the following inequality holds:

2f – gcd(pi,f) ≤ Di

Example:

For the four tasks above we see that (3) constrains the frame size to be no less than 2. This is because the maximum execution time of any task is 2 time units (we do not want to pre-empt a task within a frame).

Using (2) ⌊2/*f*⌋ - 2/*f* = 0

` ⌊2/2⌋ - 2/2 = **0**