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Algorithms and Analysis: Homework 5c Writeup

**Write-Up**

Note: My code is a little hacky (actually maybe a lot). It’s not very pretty, but I tried to make it relatively clear what’s going on. I didn’t spend the time to refactor my code extensively because of 1. lack of time and 2. this homework being focused on the write-up’s correctness.

1. Preemptions are not necessary in FIFO, because a preemption would mean the “first in” is not the “first out”.
2. Task sets 1 and 2 failed under FIFO. Red denominates missed deadlines.

Diagrams below.

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| **FIFO Task Set 1** | | | | | | | | | | | | | |
| Job | J:1,1 | J:2,1 | | | J:1,2 | J:1,3 | J:1,4 | J:2,2 | | | J:1,5 | J:1,6 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

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| **FIFO Task Set 2** | | | | | | | | | | | | | | |
| Job | J:1,1 | J:2,1 | J:3,1 | | J:2,2 | J:1,2 | J:2,3 | J:2,4 | J:3,2 | | J:1,3 | J:2,5 | J:2,6 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

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| **FIFO Task Set 3** | | | | | | | | | | |
| Job | J:1,1 | J:2,1 | | J:3,1 | J:3,2 |  | J:1,2 |  | J:3,3 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

1. EDF must account for preemptions because a task with an earlier deadline may be released while another task is running.
2. EDF only failed task set 3. Red again denominates missed deadlines.

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| **EDF Task Set 1** | | | | | | | | | | | | | |
| Job | J:1,1 | J:2,1 | J:1,2 | J:2,1 | | J:1,3 | J:1,4 | J:2,2 | J:1,5 | J:2,2 | | J:1,6 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

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| **EDF Task Set 2** | | | | | | | | | | | | | | |
| Job | J:2,1 | J:1,1 | J:2,2 | J:3,1 | | J:2,3 | J:1,2 | J:2,4 | J:2,5 | J:3,2 | | J:1,3 | J:2,6 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

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| **FIFO Task Set 3** | | | | | | | | | | |
| Job | J:3,1 | J:1,1 | J:2,1 | | J:3,2 |  | J:1,2 |  | J:3,3 |  |
| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

1. Task set 2 wasn’t schedulable with either algorithm. It is worth noting that even though EDF failed as well on the second task set, it failed much later than FIFO.

The total amount of work in the second task set is higher than the final deadline for the task set, thus it is impossible regardless of the algorithm a.k.a not schedulable.