Overview: This document will be a report on a side by side comparison of a hand produced schedule and that produced by the real time analysis tool Cheddar. 5 cases will be explored as enumerated below. The analysis will be a detailed explanation of each case, especially if the hand produced schedule differs from the one produced by Cheddar. Every schedule will use rate monotonic scheduling i.e. highest frequency equals highest priority. Finally, each case submission will contain a Cheddar XML, a spreadsheet and a copy of this report.

Case 1 Below LUB, Safe and Feasible:

In this case, the excel sheet could be taken directly from the in class examples: *sched-example-0-safe-within-LUB-disharmonic.xlsx*. The Cheddar XML was modified from the *Example-9-Single-core.xml* starter project. The two are in agreement. One easy way to see this is each of the following services occur at the following 1-indexed, 10ms intervals, as described by the sets below. One can then verify that both the spreadsheet and the Cheddar simulation reproduce these sets.

S1 = {1,3,..., 2k+1 | for k = 0,1,2…}
S2 = {2,12,...,10k +2 | for k = 0,1,2,...}

Service 3 is not as conveniently described, but only occurs 4 times within the 300ms window. These 4 occurrences are {4,6,16,18}. When extending beyond the 30, 10ms intervals simply add 30 to each value so: {34,36,46,48, …}.

Case 2 Above LUB, Feasible:

- Used *sched-example-14-above-LUB.xlsx* from class example
- Modified Case 1 xml to produce *above_and_feasible.xml*
- Cheddar and spreadsheet agree.
- Using similar description as used in case 1 we get the following,
- S1 = {2k+1 | k=0,1,2,...}
- S2 = {4k+2 | k=0,1,2,...}
- S3 = {4,8,16,24} and this pattern repeats with period 28

Case 3 Above LUB, Feasible and Harmonic, 100% Utilization:

- Used *sched-example-4-above-LUB-harmonic.xlsx* from class example
- Modified Case 2 xml to produce *above_feasible_harmonic_100.xml*
- Cheddar and spreadsheet agree.
- Using similar description as used in case 1 we get the following,
- S1 = {2k+1 | k=0,1,2,...}
- S2 = {2,4,6,8} and this pattern repeats with period 10
- S3 = {10k | k=1,2,...}

Case 4 Above LUB, Feasible and Harmonic, <100% Utilization:

- Used *sched-example-3-above-LUB-harmonic.xlsx* from class example
- Modified Case 2 xml to produce *above_feasible_harmonic_sub100.xml*
- Cheddar and spreadsheet agree.
- Using similar description as used in case 1 we get the following,
- S1 = {3k+1 | k=0,1,2,...}
- S2 = {2,3,6,8,11,12} and this pattern repeats with period 15
- S3 = {5,9,14} and this pattern repeats with period 15

Case 5 Above LUB, not Feasible:

- Used *sched-example-2-above-LUB-failure-disharmonic.xlsx* from class example
- Modified Case 2 xml to produce *failure.xml*
- Cheddar and spreadsheet agree.
- Using similar description as used in case 1 we get the following,
- S1 = {2k+1 | k=0,1,2,...}
- S2 = {2,6,12} and fails after
- S3 = {4,8} and fails after
- S4 = {10, 14} and fails after