D2L Lab7 TeamNumber:

SCS Moons userid under which Java code was submitted:

# Analysis:

## Warshall1

As discussed in class and in the textbook, the asymptotic cost of Warshall1 should be O(n3). Based on the timings you have collected and plotted does this seem accurate? Explain your answer.

Yes, the asymptotoc cost of warshall 1 is n3 as the plotted line n3 serves as a tight upper bound for the data collected from Warshall 1

## Warshall 2

Warshall2 adds shortcircuiting to Warshall1, and in theory it should therefore be more efficient. Looking at your four graphs, is this the case? Please describe the asymptotic behaviour of Warshall2 compared with the asymptotic behaviour Warshall. Explain the reasons behind the changes in this behaviour as the density changes from 10 to 100.

Based on our four graphs, Warshall2 is not more efficient than Warshall 1. The execution time continues to increase slightly due to the amount of work that needs to be done as the density increases.

## Warshall3

As discussed in class, in theory the asymptotic cost of Warshall3 should be O(n2). Based on the timings you have collected and plotted does this seem accurate? Explain your answer and speculate on the real asymptotic cost and the reasons behind this cost.

Based on our timings, no it is not accurate. Our asymptotic cost is still O(n3) because there are still 3 for loops that it is looping through.