Comments on Assignment 1

Question 1: When we say an LP is unbounded, it means that the objective function is unbounded on the feasible region, not just that the feasible region is unbounded. Many students got the first part right because the objective function just happened to be x in part (a). A number of students claim that it is obvious to see that there is a feasible solution. Instead they should just state a feasible solution. A formal mathematical proof should be given for the non-existence of an optimal solution.

Question 2: In the standard form, the objective function should be "max" not "min".

Question 3: Many students have an objective function which is either not linear or is not well defined.

Question 4: In part (a), by adding the two constraints, a number of students had obtained $(s-1)x_1 \leq -2$. Then either they divide both sides by $s-1$ and use the fact the $x_1 \geq 0$ to obtain $s \geq 1$ is impossible or argue directly that $s \geq 1$ is impossible from $(s-1)x_1 \leq -2$. In the first instance, since $s-1$ is not always positive, so the division needs to be done in two different cases. Anyways, this argument shows that there is no feasible solution if $s \geq 1$, but it must also be shown that if $s < 1$ there is a feasible solution. In part (b), a number of students constructed a solution and plugged it into the objective function without checking its feasibility.

Question 5: Generally well done.