**LP Programming and NP Theory Notes – Office Hours (11/01/2023)**

For LP Programming:

* Equation on the left, constant on the right
* With a max objective function, the constraints are upper bounds <
* With a min objective function, the constraints are lower bounds >
* Break equality (=) into two constraints
  + X = 200 becomes x >= 200 and x<= 200

For Primal - > Dual

A diagram of a graph

Description automatically generated

LP - Duality

A table with text and arrows

Description automatically generated

LP – Duality Theorem

* **Weak Duality** – Any feasible value of the dual LP is an upper bound on the original primal LP
* **Strong Duality** – A primal LP has an optimum value IFF the dual LP has an optimal value and the two optimum values coincide