FIT3158 Note - W1 Linear programming

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5 steps of In Formulating LP Models

1. Understand the problem.

Blue Ridge Hot Tubs produces two types of hot tubs: Aqua-Spas & Hydro-Luxes.

	Aqua-Spa	Hydro-Lux
Pumps	1	1
Labor	9 hours	6 hours
Tubing	12 feet	16 feet
Unit Profit	$350	$300

There are 200 pumps, 1566 hours of labor, and 2880 feet of tubing available.

$$MAX: 350X1 + 300X2$$
$$S.T.: 1X1 + 1X2 <= 200$$
$$9X1 + 6X2 <= 1566$$
$$12X1 + 16X2 <= 2880$$
$$X1 >= 0$$
$$X2 >= 0$$

2. Identify the **decision variables**.

   $X1 = \#\ of\ Aqua\ Spas\ to\ produce$
   $X2 = \#\ of\ Hydro\ Luxes\ to\ produce$

3. State the **objective function** as a linear combination of the decision variables.

   $MAX: 350X1 + 300X2$

4. State the **constraints** as linear combinations of the decision variables.

   $1X1 + 1X2 <= 200 \implies pumps$
   $9X1 + 6X2 <= 1566 \implies labor$
   $12X1 + 16X2 <= 2880 \implies tubing$

5. Identify any **upper or lower bounds** on the decision variables.

   $X1 >= 0;\ X2 >= 0$