Lesson 3 – Problem Identification

**Questons for Mentor:**

**Intro to Problem Identification:**

* There are exploratory and predictive problems
  + Exploratory examples: problems where you’re asking the below questions. Questions that are not predicting any response variable to apply to a future dataset
    - * Process the data - what are the important findings you can glean?
      * What can you tell me about sales in the last year?
      * What type of customers do we have?
    - Try to envision/hypothesize the kind of findings that are of value before you get started
  + Predictive examples:
* Problem Identification Steps:
  + Problem statement formation
  + Context
  + Criteria for success
  + Scope of solution space
  + Constraints
  + Stakeholders
  + Data sources
* General questions to answer problem identification stephs
  + Is the goal of this project exploratory or predictive?
  + Identify what the completed model will be used for and/or the expected outcome of the exploratory work - consider supervised or unsupervised methods.
  + Does the data you have access to answer #2 above, or do you need more or different data?
  + What is the data timeline and/or temporal scale of interest?
  + What is the modeling response variable? How is it described and defined?
  + Is this a classification or regression problem?
  + What deliverables will be provided after this modeling project?
* Make sure you’re solving the right problem
  + Commercial where the guy scrapes off the wrong snowy car in the morning
* Reframing can be an effective method
  + Use the dog shelter example
    - Lady opened a dog shelter, it was getting overcrowded, when people came in to give their dog away, they asked if they wanted to keep it and helped the family problem solve. This decreased the cost for shelters and opened up housing space for the animals
* Reframing method:
  + Establish legitimacy
    - Create conversational space necessary to employ reframing
    - Tell people about slow elevator example and the reframing of the problem there
  + Bring outsiders into the discussion
    - Second set of eyes/ears always helps
    - Expect input not solutions
  + Get people’s definitions in writing
  + Ask what’s missing
    - Sometimes that entails looking at the bigger picture
  + Consider multiple categories
    - Transform people’s perception of a problem
  + Analyze positive exceptions
  + Question the objective
* SMART problem statements
  + **Specific, Not General:** specific to the problem at hand
  + **Measurable:** Are there metrics that you can track so you can determine whether you were successful or not at the end of you project?
  + **Action-Oriented:** What actions can we take to solve our problem or achieve the desired impact?
  + **Relevant (to the key problem):** make sure problem statement is relevant to the problem at hand
  + **Time-bound:** Set specific timing boundaries for when to solve problem
* Best practices on crafting problem statements
  + Don’t go it alone!
    - Seek advice from the people who requested work
  + Put down initial thoughts then refine
    - Easier to react to something already on paper
    - Use initial thoughts to react and refine
  + Ask a lot of questions
    - Context,
    - Why a problem of interest
    - What’s a good outcome or answer