**Pseudo Code Outline**

**Part 1: Tables**

1. Go to API 1, filter data: Col=size (sizes include: ½”, ¾”, 1”, 2”, 2, 4, 6, 8, 14/2, 14/3, 12/2, 12/3), price. Row=EMT, connectors\*, couplings\*, straps\*, THHN, Romex.
2. Create table 1 (API 1)\*.
3. Go to API 2 or Web scrape 2 and do the same.
4. Create table 2 (API 2)\*.
5. Go to API 3 or Web scrape 3 and do the same.
6. Create table 3 (API 3)\*.
7. Consolidate tables 1, 2, 3 and add Location as column, filter by location, find minimum of each item.
8. Create Main Working Table (this is the table that will generate all values for our worksheets). The Main Working Table will be populated by the minimum price of each individual item. To populate our worksheets, we can do a V-look up on the working table or automate with a VBA drop-down menu.
9. The Main Working Table will be hosted on an active html and can be programed to automatically populate once dailey.

**\*** These items typically come in a bag of 3, 4 or 5. We will have to have the filter divide the cost by the quantity so we can return the per item cost.

\* API 1 = Home Depot, API 2 and API 3 = TBD. Home Depot is a slam dunk because they have a free API through serpapi (allows 100 searches). Unfortunately, the other suppliers either do not have API’s or do not allow public access. I do have a plan for that: web scraping or we might get lucky and find a site with a good API!

**Definite API sites**

* Home Depot

**Potential API sites**

* eBay (may not have a consistent stock of electrical supplies)
* Walmart (may not have full stock of electrical supplies)

**Definite Web scrap sites**

* Lowes
* Grainger
* Ace
* Orchard Supply

**Part 2: Worksheet**

1. Col=item, size, quantity, Material Price
2. User (input value. “item”\* and “size”\* is generated via drop down menu\*) = “item”, “size”, “quantity”.
3. Return (output value generated by the **Main Working Table**) = “Material Price” (lowest priced item), “Location” (location of lowest priced item).

\* The drop-down menu for items includes conduit, wire, Romex, connectors, couplings and straps.

\* The drop-down menu for sizes includes ½”, ¾”, 1”, 2”, 2, 4, 6, 8, 14/2, 14/3, 12/2, 12/3

**Part 3: Linear Regression**

1. Question #1: Is there a correlation between the increase/decrease in **conduit** prices and **electrical fittings** (connectors, couplings, straps)? Run a linear regression model #1 on the data using R.
2. Question #2: Is there a correlation between the increase/decrease in **wire** prices and **electrical fittings** (connectors, couplings, straps)? Run a linear regression model #2 on the data using R.
3. Question #3: Is there a correlation between the increase/decrease in **Romex** prices and **electrical fittings** (connectors, couplings, straps)? Run a linear regression model #3 on the data using R.
4. Two-Sampled T-test (in R) between prices of:

* API 1 vs API 2
* API 2 vs API 3
* API 3 vs API 1

**Part 4: Visualizations**

1. Line graph: **Line 1** = API 1 (**Home Depot**), **Line 2** = API 2 (ex: **Lowes**), **Line 3** = API 3 (ex: **Grainger**)
2. Scatter plot
3. X= days of the week (7)
4. Y= Aggregated materials prices