DATA VISUALIZATION
What is Data visualization?

- Data visualizations are surprisingly common in your everyday life, but they often appear in the form of well-known charts and graphs.
- Data visualization refers to showcasing data, numbers, and statistics through images and charts.
Why is data visualization important?

- Data visualization is especially helpful when you’re presenting data to others.
- It’s much easier for people to understand data when it’s presented visually.
- Data visualization is important in identifying trends, answering questions, proving theories easily.
Why Does Data Visualization Matter?

- Better Decision Making
- Meaningful Storytelling
- Data Literacy
Why use data visualization?

- Make data easier to understand and remember
- Discover unknown facts, outliers, and trends
- Visualize relationships and patterns quickly
- Ask better questions and make better decisions
Visualizations

- Product prices
- Price Variation
- Price Prediction
- Expected yields vs cities
- Average yield Comparison with planting and harvesting weeks
- Yield comparison on different farming methods
Products Considered

- Beans
- Lettuce
- Pepper
- Tomato
- Celery
- Cauliflower
Historical Price Variation - Years

- This plot depicts the distribution of average price of products in different years.
- In this graph we can see that the price of beans in week 28 year 2011 lies in between the median and lower quartile.
- Similarly, we can see the distribution of prices of different products by using the filter on the upper right side of the panel.
Historical Price Variation - Cities

• This plot depicts the distribution of average price of products in different cities.

• In this graph we can see that the price of beans in week 29 in San Francisco is 0.614 $/lb and it lies in between the median and lower quartile.

• Similarly, we can see the distribution of prices of different products by using the filter on the upper right side of the panel.
This graph depicts the variation of prices of different products in different cities.

In this graph the values are filtered on the San Francisco city.
Predicted Prices

- Based on the analysis of the historical data from USDA website, predicted prices per week
- For example, the predicted price of pepper is maximum at near week 27. This helps farmers to decide and plan their produce in that time frame to get the maximum profits.
- Prediction intervals will be added as bounds for the predicted prices.
Variation of Prices based on scenarios

Weeks

Average Price

Crop
- (All)
- Beans
- Lettuce
- Pepper
- Tomato

Average prices VS weeks  Historical Price Analysis  Var_Scenarios  Prices vs Scen
Variation of Prices based on scenarios

Scen_dim: 1
Weeks: 21
Avg. Price: 1.2123

Scen_dim: / Weeks

Crop
- (All)
- BNS
- CUX
- LET
- PEP
- TOM

Average prices VS weeks
Historical Price Analysis
Var_Scenarios
Prices vs Scen
Sheet 5
Dashboard 1
Cities considered for predicting yields

- Albuquerque
- Gallegos
- Phoenix
- Santa Fe
- Tucson
Predicted yields vs Cities

- Predicted yield based on planting and harvesting weeks in different cities.
- Factors considered are temperature, precipitation.
- For example, if we plant beans in Albuquerque in week 23 and harvest in week 42, according to our model we get the maximum yield of 4,561 lbs.
Predicted yields vs Cities

- This is another way of visualizing the previous graph in a detailed and clear manner.
- As we can see this tabular data predicts that in Phoenix area, if we plant Cauliflower in week 6 and harvest in week 25 the yield will be maximum, i.e. 5,752 lbs.
<table>
<thead>
<tr>
<th>Zones</th>
<th>Harvesting Week</th>
<th>Planting Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHOENIX</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2,285</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3,209</td>
<td>2,355</td>
</tr>
<tr>
<td></td>
<td>3,917</td>
<td>3,308</td>
</tr>
<tr>
<td></td>
<td>4,515</td>
<td>4,036</td>
</tr>
<tr>
<td></td>
<td>4,986</td>
<td>4,653</td>
</tr>
<tr>
<td></td>
<td>5,168</td>
<td>5,045</td>
</tr>
<tr>
<td></td>
<td>5,222</td>
<td>5,326</td>
</tr>
<tr>
<td></td>
<td>5,168</td>
<td>5,326</td>
</tr>
<tr>
<td></td>
<td>4,896</td>
<td>5,326</td>
</tr>
<tr>
<td></td>
<td>4,515</td>
<td>5,045</td>
</tr>
<tr>
<td></td>
<td>3,917</td>
<td>4,653</td>
</tr>
<tr>
<td></td>
<td>3,209</td>
<td>4,036</td>
</tr>
<tr>
<td></td>
<td>2,285</td>
<td>3,308</td>
</tr>
<tr>
<td></td>
<td>1,251</td>
<td>3,308</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1,287</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Harvesting Week:** 25  
**Planting Week:** 6  
**Zones:** PHOENIX  
**Avg. Yield:** 5,752
Expected yields vs Cities

- This graph depicts the amount of produce in different cities in different harvesting weeks.
- As we can see that Tucson has the maximum produce with a huge variation in the production of cauliflower with respect to other cities.
Yield comparison on different farming methods

- This graphs depicting the variation of yield using different technologies.
- As we can see that the produce (Celery) is up by 7 times when controlled irrigation technology is used, when compared to greenhouse.
Future Work

- Other factors need to be considered like rainfall, amount of water supply, kind of irrigation (e.g., open field, greenhouse, controlled)
Sources of Datasets

- NOAA
  - Minimum and maximum temperatures and precipitation

- USDA
  - Crop prices, transportation costs