

## ASSIGNMENT OF MAJOR PYTHON

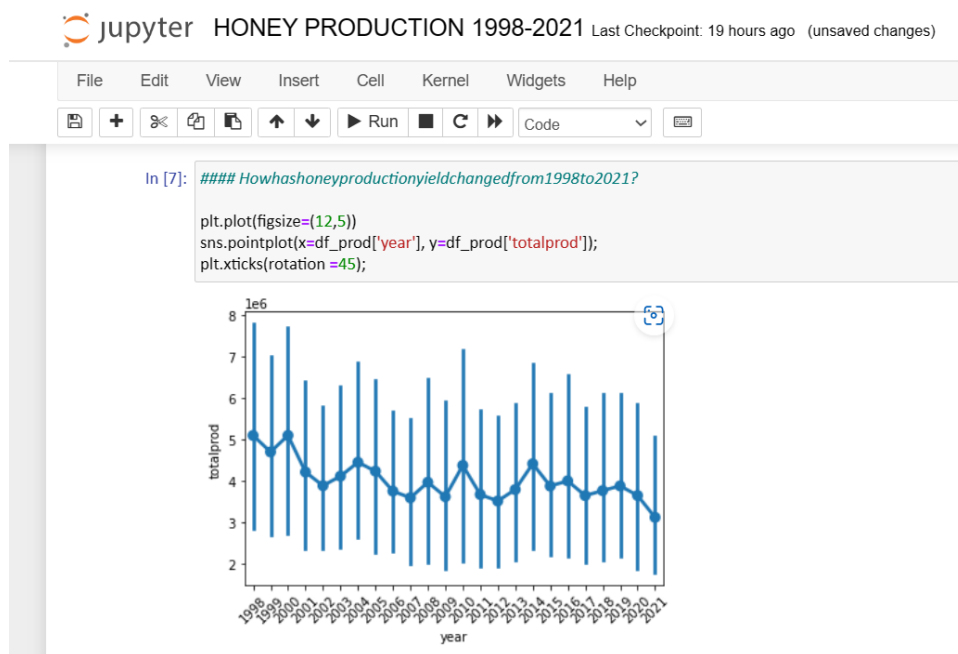
1) How has honey production yield changed from 1998 to 2021?

SYNTAX: -

```
plt.plot(figsize=(12,5))

sns.pointplot(x=df_prod['year'], y=df_prod['totalprod']);

plt.xticks(rotation =45);
```



2) Overtime, what are the major production trends across the states Convert year column to datetime?

SYNTAX: -

```
df_prod['year'] = pd.to_datetime(df_prod['year'], format='%Y')

# Plot honey production by state over time

sns.set(rc={'figure.figsize':(15, 10)})

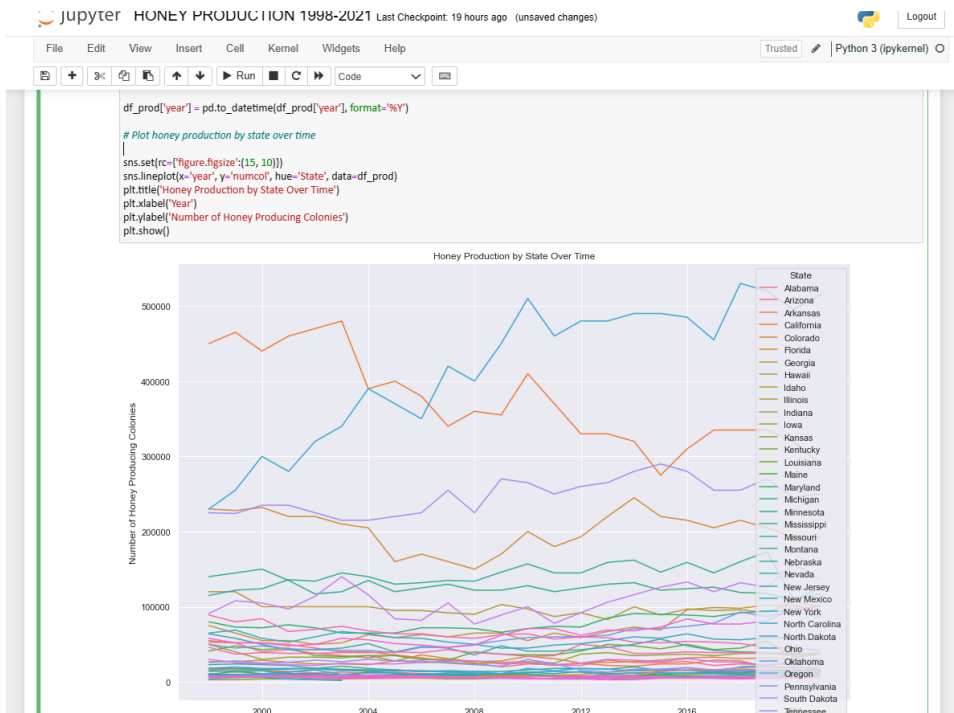
sns.lineplot(x='year', y='numcol', hue='State', data=df_prod)

plt.title('Honey Production by State Over Time')
```

```
plt.xlabel('Year')
```

```
plt.ylabel('Number of Honey Producing Colonies')
```

```
plt.show()
```



3) Does the data show any trends in terms of the number of honey producing colonies and yield per colony before 2006 , which was when concern over Colony Collapse Disorder spread nationwide?

SYNTAX: -

```
pre_2006_data = df[df['year'] < 2006]
```

```
avg_numcol = pre_2006_data.groupby('year')['numcol'].mean()
```

```
avg_yieldpercol = pre_2006_data.groupby('year')['yieldpercol'].mean()
```

```
plt.plot(avg_numcol.index, avg_numcol.values, label='Number of numcol')
```

```
plt.plot(avg_yieldpercol.index, avg_yieldpercol.values, label='yieldpercol per numcol')
```

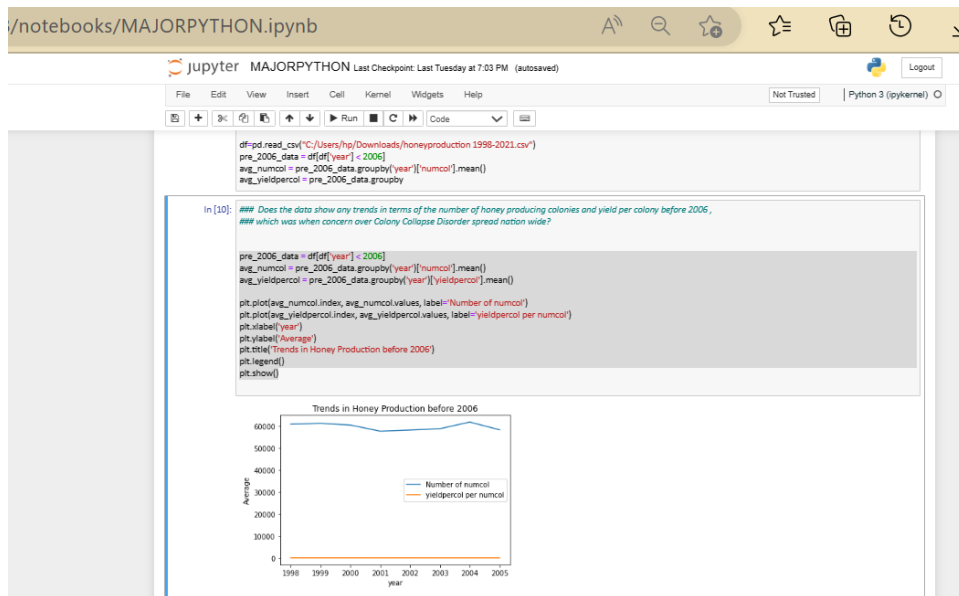
```
plt.xlabel('year')
```

```
plt.ylabel('Average')
```

```
plt.title('Trends in Honey Production before 2006')
```

```
plt.legend()
```

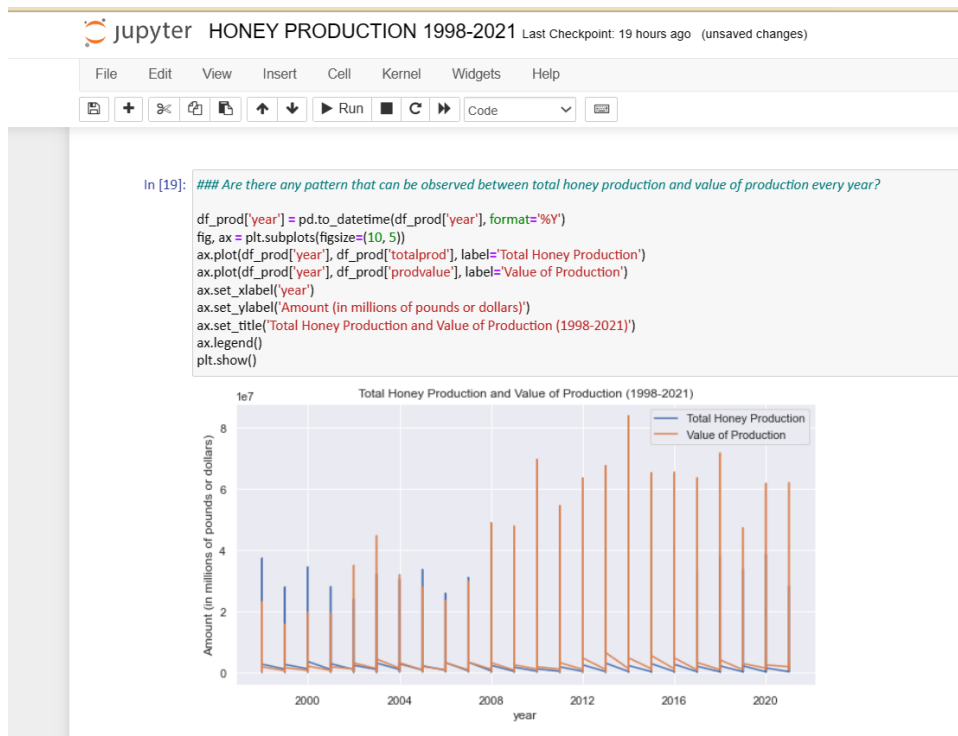
```
plt.show()
```



4) Are there any patterns that can be observed between total honey production and value of production every year?

**SYNTAX: -**

```
df_prod['year'] = pd.to_datetime(df_prod['year'], format='%Y')
fig, ax = plt.subplots(figsize=(10, 5))
ax.plot(df_prod['year'], df_prod['totalprod'], label='Total Honey Production')
ax.plot(df_prod['year'], df_prod['prodvalue'], label='Value of Production')
ax.set_xlabel('year')
ax.set_ylabel('Amount (in millions of pounds or dollars)')
ax.set_title('Total Honey Production and Value of Production (1998-2021)')
ax.legend()
plt.show()
```

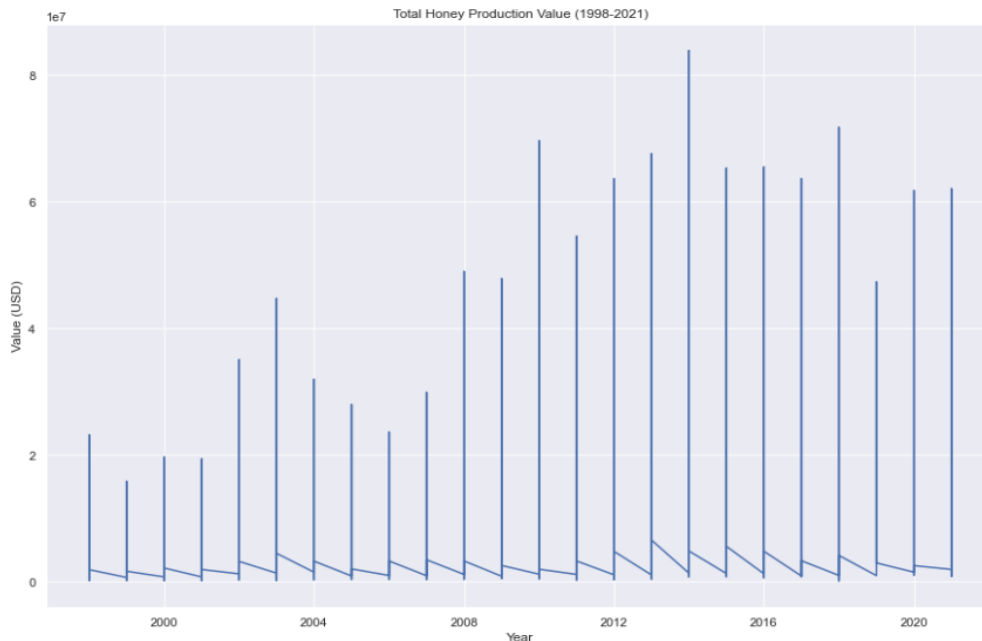


5) How has the value of production , which in some sense could be tied to demand,changed everyyear?

SYNTAX: -

```
# Convert the 'year' column to datetime format
df_prod['year'] = pd.to_datetime(df_prod['year'], format='%Y')
# Calculate the total honey production value for each year
df_prod['total_value'] = df_prod['numcol'] * df_prod['yieldpercol'] * df_prod['priceperlb']
# Plot the total honey production value over time
plt.plot(df_prod['year'], df_prod['total_value'])
plt.title('Total Honey Production Value (1998-2021)')
plt.xlabel('Year')
plt.ylabel('Value (USD)')
plt.show()
```

```
In [20]: #####How has the value of production , which in some sense could be tied to demand,changed everyyear?
# Convert the 'year' column to datetime format
df_prod['year'] = pd.to_datetime(df_prod['year'], format='%Y')
# Calculate the total honey production value for each year
df_prod['total_value'] = df_prod['numcol'] * df_prod['yieldpercol'] * df_prod['priceperlb']
# Plot the total honey production value over time
plt.plot(df_prod['year'], df_prod['total_value'])
plt.title('Total Honey Production Value (1998-2021)')
plt.xlabel('Year')
plt.ylabel('Value (USD)')
plt.show()
```



6) Constructs the related plots using Seaborn and Matplotlib apply customization and derive insights from the visualization

SYNTAX: -

```
# Convert the 'year' column to datetime format
df_prod['year'] = pd.to_datetime(df_prod['year'], format='%Y')
# Calculate the total honey production value for each year
df_prod['total_value'] = df_prod['numcol'] * df_prod['yieldpercol'] * df_prod['priceperlb']
# Create a line plot of honey production value over time
plt.figure(figsize=(12,6))
sns.lineplot(data=df_prod, x='year', y='total_value')
plt.title('Total Honey Production Value (1998-2021)')
plt.xlabel('Year')
plt.ylabel('Value (USD)')
plt.xticks(rotation=45)
plt.show()
```

```
# Create a scatter plot of honey production value vs. yield per colony
plt.figure(figsize=(8,8))
sns.scatterplot(data=df_prod, x='yieldpercol', y='total_value', hue='year', legend='full')
plt.title('Honey Production Value Vs Yield per Colony (1998-2021)')
plt.xlabel('Yield per Colony (lbs)')
plt.ylabel('Value (USD)')
plt.show()
```

