```
import pandas as pd

# Load datasets
meat_poultry_pdcs = pd.read_excel('/content/Meat&PoultryP&DCenters.xlsx')
polygons = pd.read_excel('/content/polygons.xlsx')
ultimate_production_index = pd.read_excel('/content/ULTIMATEPRODUCTIONINDEXSOUTHWEST (1).xlsx')

# Display the first few rows of each dataset to understand the structure
meat_poultry_pdcs.head(), polygons.head(), ultimate_production_index.head()
```

```
      Data Source  Shape__Area *  Shape__Length *  State  Region  Lead Region  \
0  Census Bureau       0.000001         0.003338     CA       9          9.0
1  Census Bureau       0.000002         0.006614     CA       9          9.0
2  Census Bureau       0.000002         0.007207     CA       9          9.0
3  Census Bureau       0.000004         0.014051     WA      10         10.0
4  Census Bureau       0.000004         0.017850     CA       9          9.0

   Current Use                                          Comment  \
0            Y  PIT RIVER (BIGBEND RANCHERIA) - CA is 505 on ...
1            Y                                              NaN
2            Y                                              NaN
3            Y                                              NaN
4            Y                                              NaN

                                    Name_History  Shape *
0  1988: Pit River Tribe of California (includes ...  Polygon
1              1993: Lytton Rancheria of California  Polygon
2  1982: Big Lagoon Rancheria of Smith River Indi...  Polygon
3                       2012: Nooksack Indian Tribe  Polygon
4  1985: Chicken Ranch Rancheria of Me-Wuk Indian...  Polygon

[5 rows x 28 columns],
  Program  Year      Period  Week Ending Geo Level    State  State ANSI  \
0  CENSUS  2022  END OF DEC          NaN    COUNTY  ARIZONA           4
1  CENSUS  2022  END OF DEC          NaN    COUNTY  ARIZONA           4
2  CENSUS  2022  END OF DEC          NaN    COUNTY  ARIZONA           4
3  CENSUS  2022  END OF DEC          NaN    COUNTY  ARIZONA           4
4  CENSUS  2022  END OF DEC          NaN    COUNTY  ARIZONA           4

  Ag District  Ag District Code  County  ...  Zip Code  Region  \
0    NORTHERN                10  APACHE  ...       NaN     NaN
1    NORTHERN                10  APACHE  ...       NaN     NaN
2    NORTHERN                10  APACHE  ...       NaN     NaN
3    NORTHERN                10  APACHE  ...       NaN     NaN
4    NORTHERN                10  APACHE  ...       NaN     NaN

   watershed_code  Watershed       Commodity  \
0               0        NaN          CATTLE
1               0        NaN           GOATS
2               0        NaN         GUINEAS
3               0        NaN            HOGS
4               0        NaN  POULTRY TOTALS

                                  Data Item Domain Domain Category Value  \
0    CATTLE, COWS - OPERATIONS WITH INVENTORY  TOTAL   NOT SPECIFIED  1414
1           GOATS - OPERATIONS WITH INVENTORY  TOTAL   NOT SPECIFIED  1644
2         GUINEAS - OPERATIONS WITH INVENTORY  TOTAL   NOT SPECIFIED    20
3            HOGS - OPERATIONS WITH INVENTORY  TOTAL   NOT SPECIFIED   238
4  POULTRY TOTALS - OPERATIONS WITH INVENTORY  TOTAL   NOT SPECIFIED   841

   CV (%)
0     (L)
1     (L)
2     (L)
3     (L)
4     (L)

[5 rows x 21 columns])
```

```
import pandas as pd
import matplotlib.pyplot as plt

# Load datasets
meat_poultry_pdcs = pd.read_excel('/content/Meat&PoultryP&DCenters.xlsx')
polygons = pd.read_excel('/content/polygons.xlsx')
ultimate_production_index = pd.read_excel('/content/ULTIMATEPRODUCTIONINDEXSOUTHWEST (1).xlsx')

# Filter for the required states using abbreviations: AZ, CA, UT, NV
reservation_land_filtered = polygons[polygons['State'].isin(['AZ', 'CA', 'UT', 'NV'])]

# Group by state and calculate the total reservation land using the correct column name
reservation_land = reservation_land_filtered.groupby('State')['Shape__Area *'].sum().reset_index()

# Calculate the percentage of reservation land per state
total_reservation_land = reservation_land['Shape__Area *'].sum()
reservation_land['Percentage'] = (reservation_land['Shape__Area *'] / total_reservation_land) * 100

# Display the calculated reservation land percentages
print("Reservation Land Percentage by State:")
print(reservation_land)

# Standardize state names to uppercase in meat_poultry_pdcs dataset
meat_poultry_pdcs['state_name'] = meat_poultry_pdcs['state_name'].str.upper()

# Calculate the number of P&DCs by state
pdcs_by_state = meat_poultry_pdcs[meat_poultry_pdcs['state_name'].isin(['ARIZONA', 'CALIFORNIA', 'UTAH', 'NEVADA'])]['state_name
pdcs_by_state.columns = ['State', 'P&DC_Count']

# Calculate the total L&P operations with inventory by state
lp_operations = ultimate_production_index[ultimate_production_index['State'].isin(['ARIZONA', 'CALIFORNIA', 'UTAH', 'NEVADA'])]
lp_operations = lp_operations.groupby('State')['Value'].sum().reset_index()
lp_operations.columns = ['State', 'L&P_Operations']

# Combine the data to get the production per L&P P&DC ratio
production_ratio = pd.merge(lp_operations, pdcs_by_state, left_on='State', right_on='State')
production_ratio['Production_Per_P&DC'] = production_ratio['L&P_Operations'] / production_ratio['P&DC_Count']

# Display the calculated production ratios
print("Production Per L&P P&DC Ratio by State:")
print(production_ratio)

# Plotting pie chart for reservation land percentage
plt.figure(figsize=(10, 6))
plt.pie(reservation_land['Percentage'], labels=reservation_land['State'], autopct='%1.1f%%', startangle=140)
plt.title('Reservation Land Percentage by State')
plt.savefig('reservation_land_percentage.png')
plt.show()

# Plotting bar chart for operations with inventory per state
plt.figure(figsize=(12, 8))
plt.bar(lp_operations['State'], lp_operations['L&P_Operations'], color=['blue', 'orange', 'green', 'red'])
plt.title('Operations with Inventory per State')
plt.savefig('operations_inventory_per_state.png')  # Save the bar chart
plt.ylabel('Total Operations')
plt.xlabel('State')
plt.show()
```

```
Reservation Land Percentage by State:
  State  Shape__Area *  Percentage
0    AZ       3.878900   53.757525
1    CA       0.221090    3.064078
2    NV       1.228071   17.019788
3    UT       1.887487   26.158609
Production Per L&P P&DC Ratio by State:
        State  L&P_Operations  P&DC_Count  Production_Per_P&DC
0     ARIZONA           18849          46           409.760870
1  CALIFORNIA           25188         715            35.227972
2      NEVADA            2329          39            59.717949
3        UTAH           13123          74           177.337838
```