DepartmentofComputerScienceandEngineering
PES University, Bangalore, India
PythonforComputationalProblemSolving(UE24CS151A)

Problem Statement:Level-1(Banana)

Faculties: Dr.Manjula K and Prof.Priyanka S **Date: 6th November, 2024**

Dept. of CSE, PESU **Timing: 1:45PM to 4:00PM**

Problem: Agricultural Production Data Analysis

Perform agriculture data analysis and find

1. Total Yield by Crop Type
2. Average Price by Crop Type
3. Identify High-Yield Crops by Region
4. Calculate Total Revenue by Region
5. Most Profitable Crop in Each Region
6. Region with Highest Total Yield
7. Summarize Yearly Production for a Crop".
8. Sort Regions by Average Price.
9. Add New Crop Data..

Optional Questions

10. Find Highest and Lowest Prices for a Crop.
11. Identify Underperforming Crops (if the total yield generated by that crop is less than the specified amount we can group it as underperforming crop)

Dataset: **Agricultural Production Data Analysis**(agri.csv)

Date,Crop,Region,Production,Price
01-01-2022,Rice,North,2248.9,141.81
10-01-2022,Rice,West,3692.12,95.76
21-01-2022,Soybean,South,3943.5,22.19
07-01-2022,Barley,North,1311.38,96.94
21-01-2022,Rice,North,3903.34,145.94
15-02-2022,Wheat,South,1728.61,80.27
06-02-2022,Barley,South,4152.41,127.09
19-02-2022,Soybean,West,807.41,78.53
17-01-2022,Rice,Midwest,4401.19,80.19

28-01-2022,Corn,North,4330.41,97.27
21-01-2022,Corn,Midwest,3419.45,145.27
03-02-2022,Wheat,East,4821.87,133.47
18-02-2022,Soybean,East,1507.5,29.33
15-04-2022,Barley,North,1778.79,134.35
26-03-2022,Rice,West,984.29,67.46

Methodology:

Load the Dataset- Load the dataset from a file into to a variable for easier manipulation.Data Exploration- Explore the dataset.

Detailed Analysis- Make sure you know the significance of each column and a row in a given dataset.

Implementation:

Language: Python 3.10 or above.

- Use data structures such as lists, sets and dicts to store and organize the data.
- Use/write appropriate functions – Specific to Data structures and also user defined functions foreach functionality.
- Make use of operators, loops and conditionals

Expected output for all sub-problems:

Subproblem 1

```
Enter your choice (0-11): 1
Total Yield by Crop Type: {'Rice': 15229.84, 'Soybean': 6258.41, 'Barley': 7242.5
48, 'Corn': 7749.86}
```

Subproblem 2

```
Enter your choice (0-11): 2
Average Price by Crop Type: {'Rice': 106.232, 'Soybean': 43.35, 'Barley': 119.4
6, 'Wheat': 112.24666666666667, 'Corn': 121.27000000000001}
```

Subproblem 3

```
Enter your choice (0-11): 3
High-Yield Crops by Region: {'North': ('Rice', 6152.24), 'West': ('Rice', 4676.
41), 'South': ('Barley', 4152.41), 'Midwest': ('Rice', 4401.19), 'East': ('Whea
t', 4821.87)}
```

Subproblem 4

```
Enter your choice (0-11): 4
Total Revenue by Region: {'North': 1827676.543, 'West': 483363.52190000005, 'So
uth': 753991.5765999999, 'Midwest': 849674.9276, 'East': 687789.9639}
```

Subproblem 5

```
Enter your choice (0-11): 5
Most Profitable Crop in Each Region: {'North': ('Rice', 888569.9486), 'West': (
'Rice', 419957.61460000003), 'South': ('Barley', 527729.7869), 'Midwest': ('Cor
n', 496743.5015), 'East': ('Wheat', 643574.9889)}
```

Subproblem 6

```
Enter your choice (0-11): 6
Region with Highest Total Yield: ('North', 14806.82)
```

Subproblem 7

```
Enter your choice (0-11): 7
Enter the crop name: Rice
Yearly Production Summary for Rice: {'2022': 15229.84}
```

Subproblem 8

```
Enter your choice (0-11): 8
Regions sorted by average price (highest to lowest): [('North', 123.21833333333
332), ('Midwest', 112.73), ('East', 81.4), ('West', 80.58333333333333), ('South
', 76.51666666666667)]
```

Subproblem 9

```
Enter your choice (0-11): 9
Enter date (DD-MM-YYYY): 22-05-2022
Enter crop name: Wheat
Enter region: North
Enter production: 1234.00
Enter price: 345.89
```

Subproblem 10

```
Enter your choice (0-11): 10
Enter the crop name: Wheat
Highest and Lowest Prices for Wheat: {'highest_price': 345.89, 'lowest_price':
80.27}
```

Subproblem 11

```
Enter your choice (0-11): 11
Enter yield threshold: 8000
Underperforming Crops: {'Soybean': 6258.41, 'Barley': 7242.58, 'Corn': 7749.86}
```

Submission Mode:

Link is shared by Faculty member for set of students in each venue. Choose the correct section you belong to in the current semester.

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