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COURSE NAME: ISIG Laboratory **CLASS: T. Y. B.Tech**

Experiment No. 1

CO/LO: Describe the types of support that an information system can provide to each functional area of the organization.

AIM / OBJECTIVE: To design and implement an Operational Support System (OSS) and a Management Support System (MSS) for an organization using Python

THEORY:

Information systems play a critical role in managing organizational operations, improving efficiency, and supporting decision-making processes. These systems comprise hardware, software, and data that interact to collect, process, and store information. A management system provides a framework for maintaining organizational processes in alignment with strategic goals.

Operational Support System:

- The role of operational support system is to efficiently process business transaction, control industrial process support enterprise communication and update corporate database.
- The Information system generally deals with the support of business operations known as operation support system produces a variety of information product for external and internal use, however such products produced by OSS needs further processing for efficient use by manager.

The various Operation Support System are:

i) Transaction Processing System (TPS)

ii) Process Control System (PCS) iii)

Enterprise Collaboration System (ECS)

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Management System

It refers to a structured framework of policies, procedures, and processes designed to manage and control an organization effectively. It integrates all aspects of operations, administration, and performance monitoring to ensure that objectives are met efficiently and consistently.

Key Characteristics of a Management System

1. **Goal-Oriented:** Focuses on achieving specific organizational objectives.
2. **Systematic:** Operates through clearly defined processes and procedures.
3. **Integrated:** Combines different areas such as finance, operations, HR, and IT into a cohesive framework.
4. **Scalable:** Adaptable to changes in organizational size or complexity.
5. **Data-Driven:** Relies on accurate and real-time data for decision-making.

Purpose of a Management System

1. **Efficiency:** Streamlines organizational activities to save time and resources.
2. **Consistency:** Ensures uniformity in operations and output.
3. **Accountability:** Tracks performance and enforces responsibility across departments.
4. **Adaptability:** Helps the organization adapt to industry changes and innovations.
5. **Decision Support:** Provides tools for monitoring, reporting, and analytics.

Key concepts involved in this lab:

1. Data Collection and Preparation: Importing and cleaning datasets.
2. Descriptive Analysis: Summarizing data using statistics and visualization.
3. Trend Analysis: Identifying patterns across multiple years.
4. Decision Support: Using analysis to provide recommendations.
5. Visualization: Representing findings for better understanding.

Requirements:

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- **Python 3.x**
- **Libraries: Pandas, NumPy, Matplotlib, Seaborn**

Steps/Procedure:

1. **Case Study Selection:**

   Students must select a dataset based on an organizational use case (e.g., sales, employee performance, inventory management, or customer feedback). The dataset should have time-series data across multiple years.

2. **Data Preprocessing:**

   •Load the dataset into Python using Pandas.

   •Perform cleaning operations such as handling missing values and removing duplicates.

   •Transform data into a structured format suitable for analysis.

3. **Analysis Implementation:**

   •Perform descriptive analysis using statistical measures (mean, median, mode, etc.).

   •Conduct time-series analysis to find trends and patterns.

   •Visualize data using line charts, bar graphs, and heatmaps.

4. **Insight Generation:**

   •Identify key findings based on the analysis.

   •Discuss potential causes of trends or anomalies.

5. **Recommendations and Conclusion:**

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•Propose solutions to improve the organization's performance based on the findings.

•Highlight the governance implications and decision-making impact.

Observation Template:

•**Dataset Description**: Describe the dataset used (source, size, and columns).

•**Key Observations:** Summarize trends, anomalies, and patterns observed in the data.

•**Visualization:** Attach graphs or charts generated during the analysis.

OBSERVATION CODE:

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


# Step 1: Load the data from the CSV file df =
pd.read_csv('DailyDelhiClimateTest 1.csv')


# Step 2: Data Preprocessing
# Convert 'date' column to datetime format (if it's not already in the right format) df['date']
= pd.to_datetime(df['date'], format='%Y-%m-%d', errors='coerce')


# Step 3: Descriptive Statistics for Weather Data
mean_temp = df['meantemp'].mean() median_temp
= df['meantemp'].median() mean_humidity =
df['humidity'].mean() median_humidity =
```

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```
df['humidity'].median() mean_wind_speed =
df['wind_speed'].mean() median_wind_speed =
df['wind_speed'].median() mean_pressure =
df['meanpressure'].mean() median_pressure =
df['meanpressure'].median()

print(f"Mean Temperature: {mean_temp}") print(f"Median
Temperature: {median_temp}") print(f"Mean Humidity:
{mean_humidity}") print(f"Median Humidity:
{median_humidity}") print(f"Mean Wind Speed:
{mean_wind_speed}") print(f"Median Wind Speed:
{median_wind_speed}") print(f"Mean Pressure:
{mean_pressure}") print(f"Median Pressure:
{median_pressure}")

# Step 4: Time-Series Plot for Weather Data plt.figure(figsize=(12,
8))

# Plot each weather variable plt.subplot(2, 2, 1) plt.plot(df['date'], df['meantemp'],
marker='o', color='b', label='Mean Temperature') plt.title('Mean Temperature Over
Time') plt.xlabel('Date') plt.ylabel('Temperature (°C)') plt.xticks(rotation=45)
```

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```
plt.subplot(2, 2, 2) plt.plot(df['date'], df['humidity'], marker='o',
color='g', label='Humidity') plt.title('Humidity Over Time')
plt.xlabel('Date') plt.ylabel('Humidity (%)') plt.xticks(rotation=45)

plt.subplot(2, 2, 3)
plt.plot(df['date'], df['wind_speed'], marker='o', color='r', label='Wind Speed')
plt.title('Wind Speed Over Time') plt.xlabel('Date') plt.ylabel('Wind Speed
(m/s)') plt.xticks(rotation=45)

plt.subplot(2, 2, 4)
plt.plot(df['date'], df['meanpressure'], marker='o', color='purple', label='Mean Pressure')
plt.title('Mean Pressure Over Time') plt.xlabel('Date') plt.ylabel('Pressure (hPa)')
plt.xticks(rotation=45)

plt.tight_layout() plt.show()

# Step 5: Correlation Heatmap
# Compute the correlation matrix for the weather variables correlation_matrix =
df[['meantemp', 'humidity', 'wind_speed', 'meanpressure']].corr()

# Plot the heatmap plt.figure(figsize=(8, 6)) sns.heatmap(correlation_matrix, annot=True,
cmap='coolwarm', fmt='.2f', linewidths=0.5) plt.title('Correlation Heatmap of Weather
Data') plt.show()
```

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OUTPUT:

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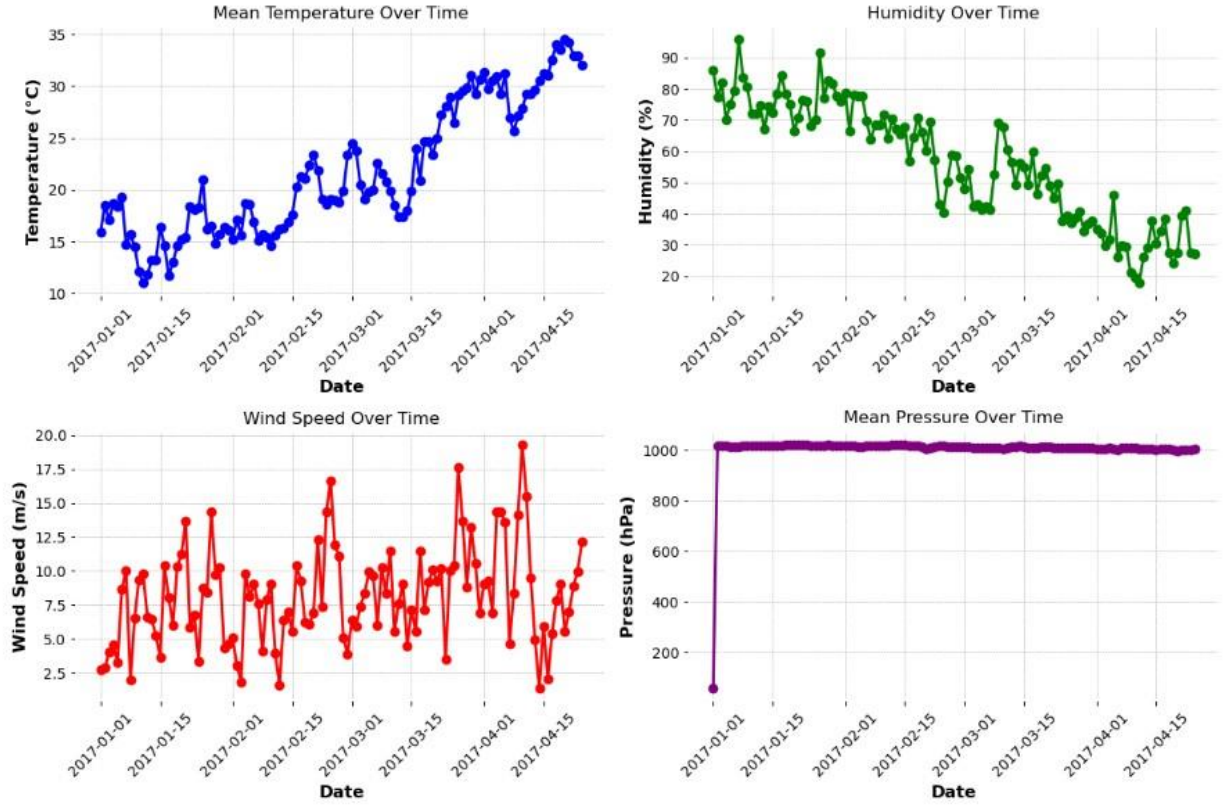
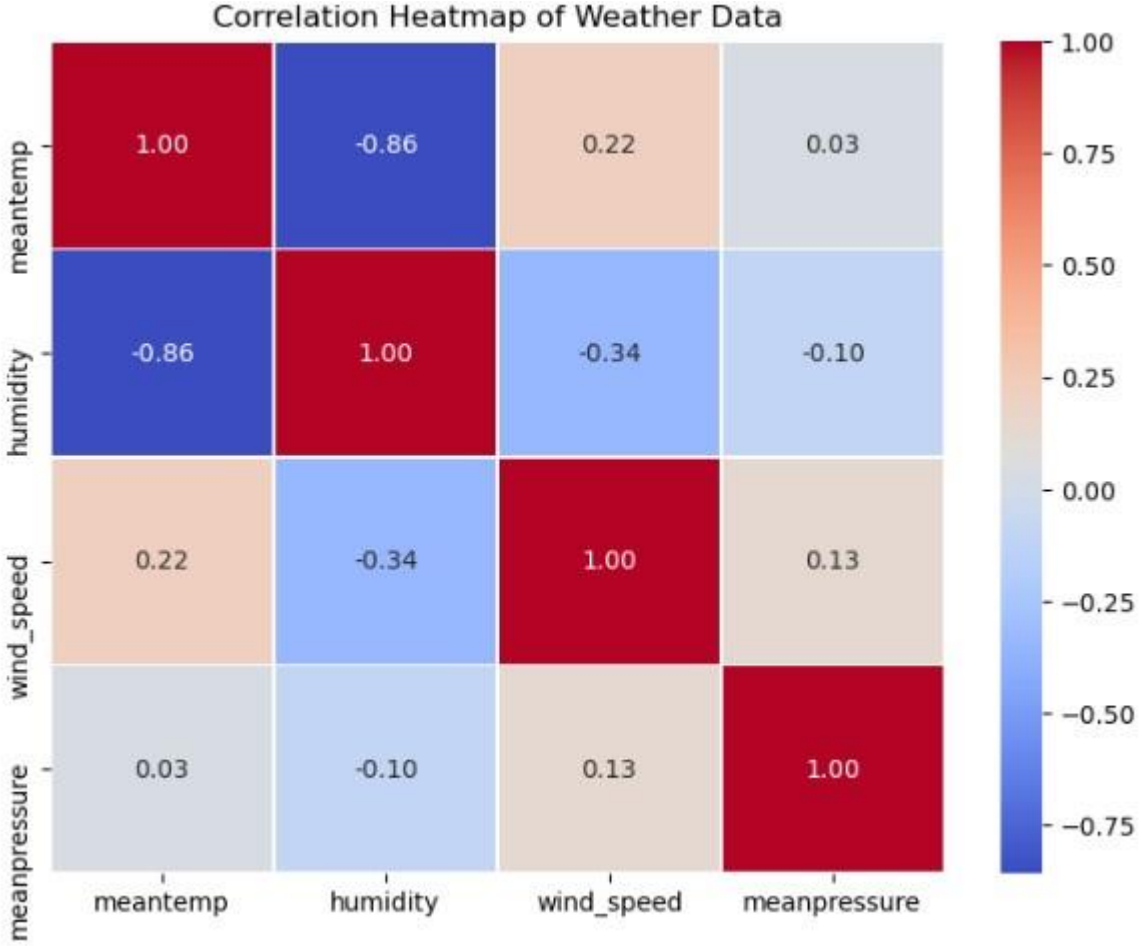
```
Mean Temperature: 21.71307892022824
Median Temperature: 19.875
Mean Humidity: 56.258361837263266
Median Humidity: 57.75
Mean Wind Speed: 8.143924054573581
Median Wind Speed: 8.069444444444443
Mean Pressure: 1004.03508969052
Median Pressure: 1012.7393162393162
```





CONCLUSION:

Operational Support System (OSS) and a Management Support System (MSS) for an organization using Python Implemented

REFERENCES:

1. Turban, E., McLean, E., and Wetherbe, J., "Information Technology for Management," John Wiley and Sons, 2nd Edition, 2000.

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2. D.P. Goyal, "Management Information Systems-Managerial Perspectives," Macmillan, New Delhi, 2006.