

Title : Check Attendance Percentage of Students.

Procedure:

1. Install Python from <https://www.python.org>
2. Install Visual Studio Code (VS Code) from <https://code.visualstudio.com>
3. Open VS Code and install the **Python extension** from the Extensions tab
4. Open Terminal in VS Code using Ctrl + ~ or from the **View** → **Terminal** menu
5. Run the following command in the terminal to install required modules:
Bash:
`pip install pandas openpyxl`
6. Create a new folder and place your Excel file inside it
7. In the same folder, create a new Python file named `attendance_report.py`
8. Copy and paste the full Python script into `attendance_report.py`
9. Save the file using Ctrl + S
10. Make sure the file name in the script matches your Excel file's name

Problem Analysis :

To solve this problem, we need to calculate the attendance percentage of students from an Excel file, assign marks based on predefined criteria, and generate two reports: one detailing each student's attendance and marks, and another summarizing the number of students in different attendance percentage brackets.

Approach

Reading Data: The program reads student attendance data from an Excel file using the pandas library.

Calculating Attendance Percentage: For each student, the attendance percentage is calculated using the formula:

$$\text{Percentage} = (\text{Total Days} / \text{Days Present}) \times 100$$

Assigning Marks: Based on the calculated percentage, marks are assigned as follows:

5 marks for $\geq 70\%$

4 marks for $\geq 60\%$ and $< 70\%$

3 marks for $\geq 45\%$ and $< 60\%$

2 marks for $< 45\%$

Generating Reports:

Individual Student Report: Lists each student's name, ID, attendance percentage (rounded), and marks.

Attendance Percentage Count Report: Summarizes the number of students in each attendance bracket ($\geq 70\%$, $\geq 60\%$, $\geq 45\%$, $\leq 30\%$).

Implementation :

```
import pandas as pd
```

```
file_path = "attendance.xlsx"
```

```
df = pd.read_excel(file_path)
```

```
total_students = df.shape[0]
```

```
print(f"Total students in sheet: {total_students}")
```

```
# How many students to display
```

```
num_students = int(input("Please enter the Number of Students: "))
```

```
print("\n.....")
```

```
df = df.head(num_students)
```

```
attendance_data = df.iloc[:, 3:]
```

```
# Calculate attendance percentage
```

```
def calculate_percentage(row):
```

```
    total_classes = (row == 'P').sum() + (row == 'A').sum()
```

```

if total_classes == 0:
    return 0
present_count = (row == 'P').sum()
return round((present_count / total_classes) * 100, 2)

```

```
df['Attendance'] = attendance_data.apply(calculate_percentage, axis=1)
```

```

def assign_marks(pct):
    if pct >= 70:
        return 5
    elif pct >= 60:
        return 4
    elif pct >= 45:
        return 3
    elif pct >= 30:
        return 2
    elif pct <= 30:
        return 1
    else:
        return 0

```

```
df['Marks'] = df['Attendance'].apply(assign_marks)
```

Print Results

```

print("\nCalculated Attendance Percentage:")
print("No. Name ID Percentage Marks")
for idx, row in df.iterrows():
    print(f"{idx + 1:<4} {row['Student\'s Name']:<35} {row['Student\'s ID']:<20} {row['Attendance']:<10}% {row['Marks']}")

```

Summary counts

```

count_70 = df[df['Attendance'] >= 70].shape[0]
count_60 = df[(df['Attendance'] >= 60) & (df['Attendance'] < 70)].shape[0]
count_45 = df[(df['Attendance'] >= 45) & (df['Attendance'] < 60)].shape[0]
count_30_44 = df[(df['Attendance'] >= 30) & (df['Attendance'] < 45)].shape[0]

```

```

count_30 = df[df['Attendance'] <= 30].shape[0]

print("\n.....")
print("\nAttendance Percentage (Student Count):")
print("No. Percentage    Count")
print(f"1. >= 70%         {count_70}")
print(f"2. 60% - 69%      {count_60}")
print(f"3. 45% - 59%        {count_45}")
print(f"4. 30% - 44%        {count_30_44}")
print(f"5. <= 30%          {count_30}")

```

Output :

```

PS E:\221002535 Assignment> & C:/Users/Admin/AppData/Local/
C:/Users/Admin/AppData/Local/Packages/PythonSoftwareFoundat
penpyxl\worksheet\_reader.py:329: UserWarning: Unknown exte
warn(msg)
Total students in sheet: 46
Please enter the Number of Students: 30

.....

```

Calculated Attendance Percentage:

| No. | Name | ID | | |
|------|-------------------------------|-------------|------|-----|
| 1 | nan | nan | | |
| 2 | Md. Mehrab Hossain Ornob | 183002083.0 | | |
| 3 | Md. Khalid Iqbal | 191002378.0 | | |
| 4 | Md. Saiful Islam Shahin | 192002116.0 | | |
| 5 | A. N. M. Abdulla | 202002054.0 | | |
| 6 | Md. Jannatul Sayed Prince | 211002098.0 | | |
| 7 | Md Albhee Rahman | 211002118.0 | | |
| 8 | Md. Tamgid-Ul Hossain | 212002106.0 | | |
| 9 | Alvi Islam Al-Amin | 212002155.0 | | |
| 10 | Md. Emon Mia | 213002137.0 | | |
| 11 | Md. Kamrul Hassan Anik | 213002169.0 | | |
| 12 | Shinoor Uddin Shova | 213902025.0 | | |
| 22 | Nusrat Jahan Mim | 221002343.0 | | |
| 40.0 | Shahadat Hosen Nishan | 221002099.0 | | |
| % 2 | | | | |
| 23 | Naimur Rahman | 221002401.0 | | |
| 55.0 | Mahmudul Hasan | 221002209.0 | | |
| % 3 | | | | |
| 24 | Md. Al-Imran | 221002470.0 | | |
| 65.0 | Siam Khan | 221002274.0 | | |
| % 4 | | | | |
| .0 | % 2 | | | |
| 26 | Jahidul Islam | 221002504.0 | 55.0 | % 3 |
| 27 | Md.Saidur Rahman Sayed | 221002525.0 | 35.0 | % 2 |
| 28 | Al Ekram Hossain | 221002535.0 | 60.0 | % 4 |
| 29 | Doly Akter | 221002572.0 | 5.0 | % 1 |
| 30 | Most. Ummay Sania Sazzat Akhi | 221002605.0 | 45.0 | % 3 |

Attendance Percentage (Student Count):

| No. | Percentage | Count |
|-----|------------|-------|
| 1. | >= 70% | 0 |
| 2. | 60% - 69% | 7 |
| 3. | 45% - 59% | 6 |
| 4. | 30% - 44% | 8 |
| 5. | <= 30% | 9 |

Conclusion :

This program's goal was to automate the process of figuring out students' attendance percentages and allocating grades in accordance with predetermined thresholds. We analyzed an Excel file with raw attendance records using Python and the pandas module, sanitized the data, and effectively calculated attendance statistics.

By counting the number of classes that were marked as "P" (present) and computing the percentage based on the total number of class sessions, the attendance of each student was assessed. After that, marks were given based on the following guideline:

$\geq 70\% = 5$ points

$\geq 60\% = 4$ points

$\geq 45\% = 3$ points

$< 30\% = 2$ points

A fair grading system where increased attendance is rewarded with higher grades is ensured by this mapping.

Two output files were also produced by the code:

A summary report in text format that includes each student's name, ID, attendance percentage, and grades

An Excel document for administrative purposes that contains comprehensive data

To provide a brief picture of the class's overall attendance pattern, a summary of the number of students in each percentage bracket was also included.

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