```python
# -*- coding: utf-8 -*-
"""Alaiba_Nawaz_Day1_W3.ipynb

Automatically generated by Colaboratory.

Original file is located at
    https://colab.research.google.com/drive/1VmlgWAQD-cf5EOW_eFxPQa_TI77-_WH9
"""

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

data = pd.read_csv("/content/pokemon.csv")

data.info()

data['type1'].unique()

sns.pairplot(data[['type1','attack', 'defense', 'speed']], hue='type1',
markers='o', diag_kind='kde')
plt.suptitle("Pair Plot")
plt.xlabel('Attributes (Attack, Defense, Speed)')
plt.ylabel('Attributes (Attack, Defense, Speed)')
plt.show()

"""TASK 2"""

#Which Pokemon has the highest base total stats?
highest_base = data[data["base_total"] == data["base_total"].max()]
pokemon = highest_base[["name" , "base_total"]]
print(pokemon)

#How does the average height and weight of Pokemon differ between
different generations?

generation = data.groupby("generation").agg({"height_m" : "mean" ,
"weight_kg" : "mean"})
generation.reset_index(inplace=True)
```

```python
#visualise
plt.figure(figsize=(10, 6))
plt.plot(generation['generation'], generation['height_m'], label='Average
Height (m)')
plt.plot(generation['generation'], generation['weight_kg'], label='Average
Weight (kg)')

plt.xlabel('generation')
plt.ylabel('Average Height and Weight')
plt.title('Average Height and Weight of Pokemon Across Generations')
plt.legend()
plt.xticks(generation['generation'])
plt.grid(True)
plt.show()

#Can we identify any correlations between a Pokemon's height, weight, and
base stat total? Are larger or heavier Pokemon generally more powerful in
battles?
pokemon_data = data[['height_m', 'weight_kg', 'base_total']]
correlation_matrix = pokemon_data.corr()

# Visualize the correlation matrix using a heatmap
plt.figure(figsize=(8, 6))
plt.title('Correlation between Height, Weight, and Total Base Stats of
Pokemon')
plt.imshow(correlation_matrix, cmap='coolwarm', interpolation='nearest')
plt.xticks(range(len(correlation_matrix.columns)),
correlation_matrix.columns, rotation=45)
plt.yticks(range(len(correlation_matrix.columns)),
correlation_matrix.columns)
plt.colorbar()
plt.show()

#does height_m matters with attack
correlation = data["height_m"].corr(data["attack"])
print(correlation)

#How has the average base speed of Pokemon changed over time? Are newer
generations introducing faster or slower creatures?
average_speed_by_generation = data.groupby('generation')['speed'].mean()
```

```python
# visualising
plt.figure(figsize=(10, 6))
plt.plot(average_speed_by_generation.index,
average_speed_by_generation.values, marker='o', color='b')
plt.title('Average Base Speed of Pokemon Across Different Generations')
plt.xlabel('Generation')
plt.ylabel('Average Base Speed')
plt.xticks(average_speed_by_generation.index)
plt.grid(True)
plt.tight_layout()
plt.show()
```