Exploratory Data Analysis

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

plt.style.use("seaborn -v0_8 -dark")
```

1 Loading Dataset

```
disaster = pd.read_csv("data/global_disaster_response_2018_2024 (1).csv")
disaster.head()
```

	date	country	disaster_type	severity_index	casualties	economic_loss_usd	response_time_hours	aid_amount_usd	response_efficiency_score	recovery_days	latitude	longitude
0	2021-01-31	Brazil	Earthquake	5.99	111	7934365.71	15.62	271603.79	83.21	67	-30.613	-122.557
1	2018-12-23	Brazil	Extreme Heat	6.53	100	8307645.09	58.39	265873.61	96.18	55	10.859	-159.194
2	2020-08-10	India	Hurricane	1.55	22	7651363.95	32.54	49356.60	49.40	22	0.643	-160.978
3	2022-09-15	Indonesia	Extreme Heat	4.55	94	1308257.31	71.81	237512.88	86.41	47	-33.547	30.350
4	2022-09-28	United States	Wildfire	3.80	64	2655861.36	24.90	188910.69	72.81	42	-19.170	-117.137

2 Number of Disasters Over Time

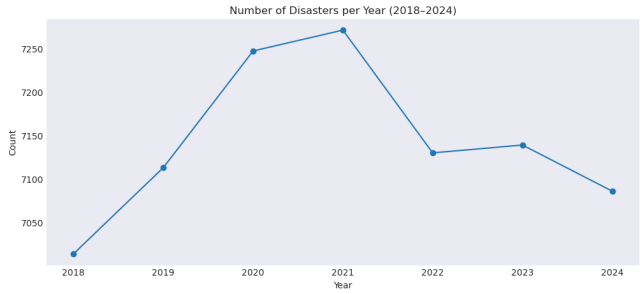
```
#transforming date to usable temporal format
disaster["date"] = pd.to_datetime(disaster["date"], errors="coerce")
disaster["year"] = disaster["date"].dt.year

disasters_per_year = disaster.groupby("year").size().sort_index()

fig, ax = plt.subplots(figsize=(12, 5))
disasters_per_year.plot(kind="line", marker="o", ax=ax)

ax.set_title("Number of Disasters per Year (2018-2024)")
ax.set_xlabel("Year")
ax.set_ylabel("Count")

fig.savefig("figures/disasters_per_year.png", dpi=100, bbox_inches="tight")
plt.show()
```



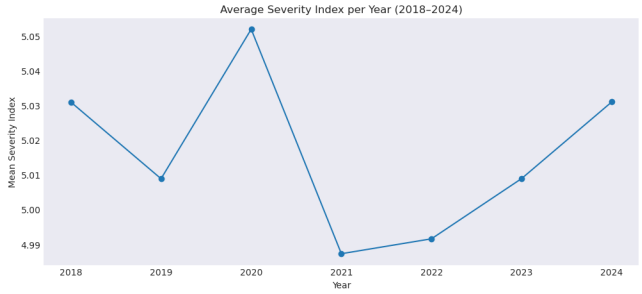
3 Average Severity Over Time

```
severity_per_year = disaster.groupby("year")["severity_index"].mean().sort_index()

fig, ax = plt.subplots(figsize=(12, 5))
severity_per_year.plot(kind="line", marker="o", ax=ax)

ax.set_title("Average Severity Index per Year (2018-2024)")
ax.set_xlabel("Year")
ax.set_ylabel("Mean Severity Index")

fig.savefig("figures/severity_per_year.png", dpi=100, bbox_inches="tight")
plt.show()
```



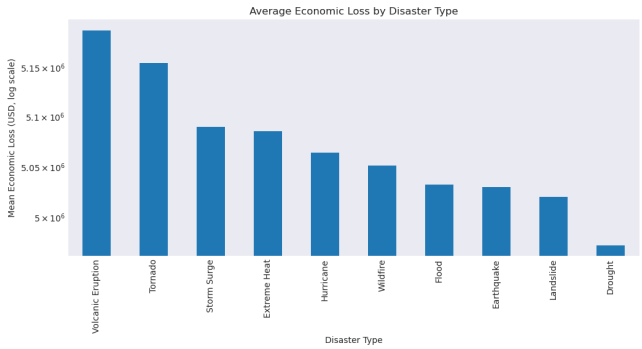
4 Average Economic Loss by Disaster Type

```
loss_by_type = disaster.groupby("disaster_type")["economic_loss_usd"].mean().sort_values(asc

fig, ax = plt.subplots(figsize=(12, 5))
loss_by_type.plot(kind="bar", ax=ax)

ax.set_title("Average Economic Loss by Disaster Type")
ax.set_xlabel("Disaster Type")
ax.set_ylabel("Mean Economic Loss (USD, log scale)")
ax.set_yscale("log")

fig.savefig("figures/avg_economic_loss_by_disaster_type.png", dpi=100, bbox_inches="tight")
plt.show()
```



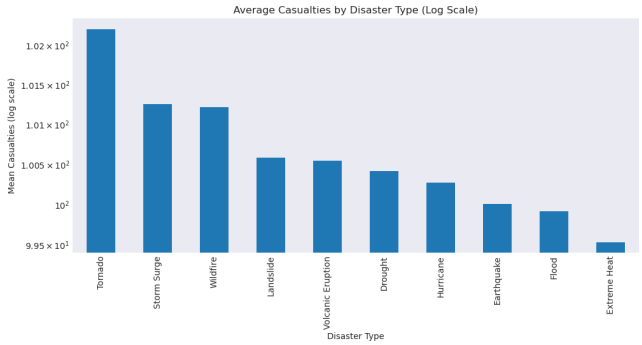
5 Average Casualties by Disaster Type

```
casualties_by_type = disaster.groupby("disaster_type")["casualties"].mean().sort_values(asce

fig, ax = plt.subplots(figsize=(12, 5))
casualties_by_type.plot(kind="bar", ax=ax)
```

```
ax.set_title("Average Casualties by Disaster Type (Log Scale)")
ax.set_xlabel("Disaster Type")
ax.set_ylabel("Mean Casualties (log scale)")
ax.set_yscale("log")

fig.savefig("figures/avg_casualties_by_disaster_type.png", dpi=100, bbox_inches="tight")
plt.show()
```



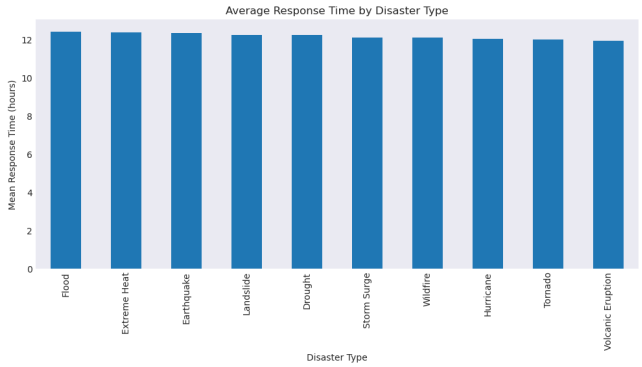
6 Average Response Time by Disaster Type

```
response_time_by_type = disaster.groupby("disaster_type")["response_time_hours"].mean().sort

fig, ax = plt.subplots(figsize=(12, 5))
response_time_by_type.plot(kind="bar", ax=ax)

ax.set_title("Average Response Time by Disaster Type")
ax.set_xlabel("Disaster Type")
ax.set_ylabel("Mean Response Time (hours)")

fig.savefig("figures/avg_response_time_by_disaster_type.png", dpi=100, bbox_inches="tight")
plt.show()
```



7 Average Recovery Days by Disaster Type

```
recovery_days_by_type = disaster.groupby("disaster_type")["recovery_days"].mean().sort_value

fig, ax = plt.subplots(figsize=(12, 5))
recovery_days_by_type.plot(kind="bar", ax=ax)

ax.set_title("Average Recovery Days by Disaster Type")
ax.set_xlabel("Disaster Type")
ax.set_ylabel("Mean Recovery Time (days)")

fig.savefig("figures/avg_recovery_days_by_disaster_type.png", dpi=100, bbox_inches="tight")
plt.show()
```