EDA Walkthrough - AFAD Historical Data

I have performed an Exploratory Data Analysis (EDA) on the AFAD historical earthquake data (1990-2025). Here are the key findings and visualizations.

Data Summary

• **Total Records**: 537,378 earthquakes

• **Time Range**: 1990 - 2025

• **Magnitude Range**: 0.0 - 7.7

• **Depth Range**: 0.0 - 82.8 km

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Data Information

Data Information

Column	Non-Null Count	Dtype
rms	537378	float64
eventID	537378	int64
location	537364	object
latitude	537378	float64
longitude	537378	float64
depth	537378	float64
type	537378	object
magnitude	537378	float64
country	530473	object
province	521140	object
district	521140	object
neighborhood	430527	object
date	171023	datetime64[ns]
isEventUpdate	537378	bool
lastUpdateDate	2174	object

Data Info

Data Sample (First 5 Rows)

First 5 Rows

rms	eventID	location	latitude	longitude	depth	type	magnitude	country	province	district	neighborhood	date	isEventUpdate	lastUpdateDate
0.0	237966	Kandıra (Kocaeli	41.0	30.0	7.0	Md	3.0	Türkiye	Kocaeli	Kandıra	Hacışeyh	1990-01-03 13:30	False	nan
0.0	237967	Pazaryeri (Bilecik	40.0	30.0	1.0	Md	3.0	Türkiye	Bilecik	Pazaryeri	Demirköy	1990-01-04 11:32	False	nan
0.0	237968	Mengen (Bolu)	41.0	32.0	7.0	Md	3.0	Türkiye	Bolu	Mengen	Çubuk	1990-01-06 12:59	False	nan
1.0	237969	Kulu (Konya)	39.0	33.0	12.0	Md	3.0	Türkiye	Konya	Kulu	Celep	1990-01-06 14:08	False	nan
0.0	237970	Altındağ (Ankara	40.0	33.0	1.0	Md	3.0	Türkiye	Ankara	Altındağ	Tatlar	1990-01-07 04:46	False	nan

Data Head

Summary Statistics

Enhanced Summary Statistics

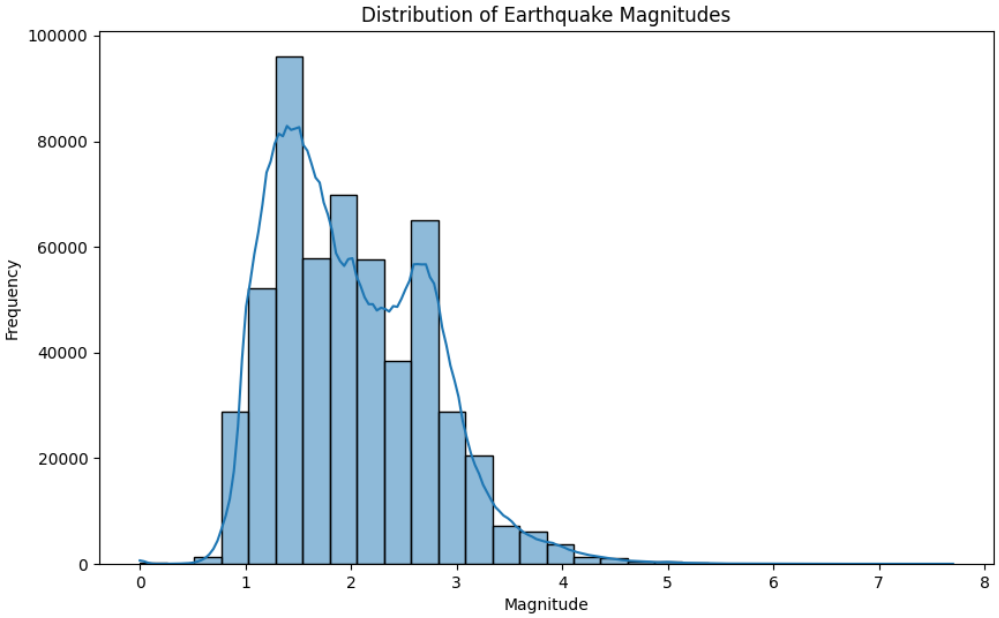
	count	mean	std	min	25%	50%	75%	max	skew	kurtosis
magnitude	537378.0	2.0	0.73	0.0	1.4	1.9	2.6	7.7	0.65	0.26
depth	537378.0	8.32	6.03	-0.03	6.99	7.0	7.15	345.2	9.34	160.63
latitude	537378.0	38.49	1.32	26.77	37.58	38.45	39.28	45.94	0.04	0.17
longitude	537378.0	32.84	5.58	13.08	27.91	30.62	37.78	127.13	0.45	-1.01

Summary Statistics

Univariate Analysis

Magnitude Distribution

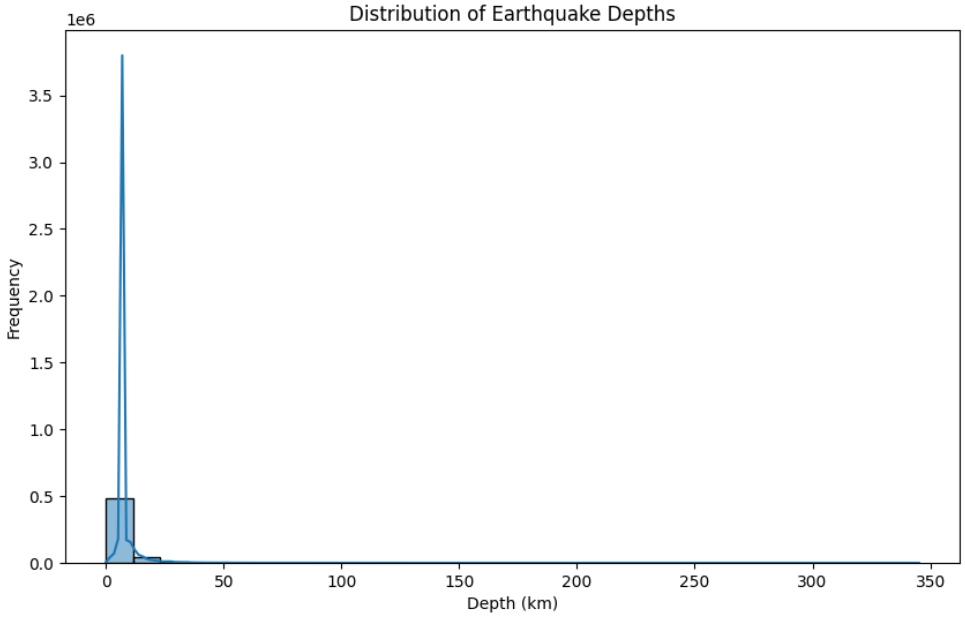
The distribution of earthquake magnitudes shows that the vast majority of recorded earthquakes are of low magnitude.



Magnitude Distribution

Depth Distribution

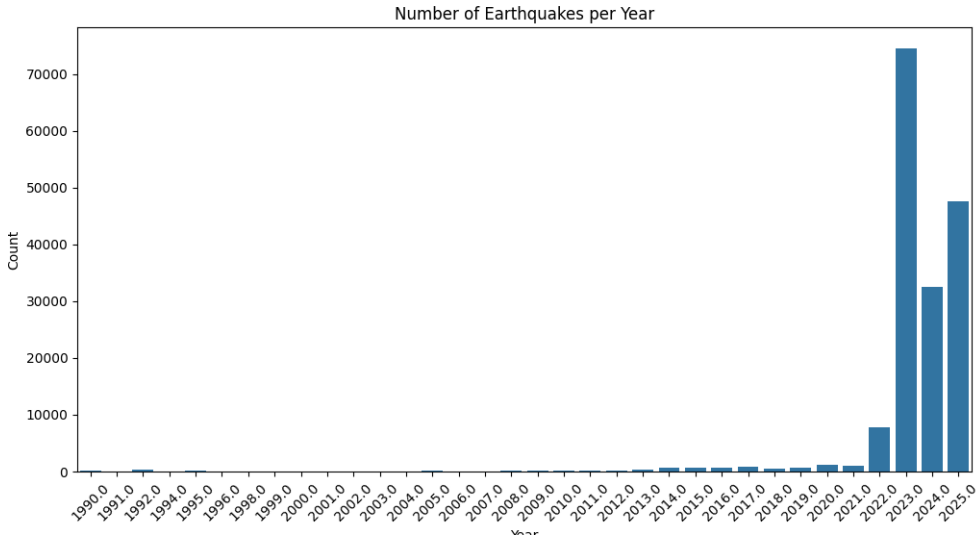
Most earthquakes occur at shallow depths.



Depth Distribution

Temporal Distribution

The number of recorded earthquakes has increased over the years, likely due to improved detection networks.

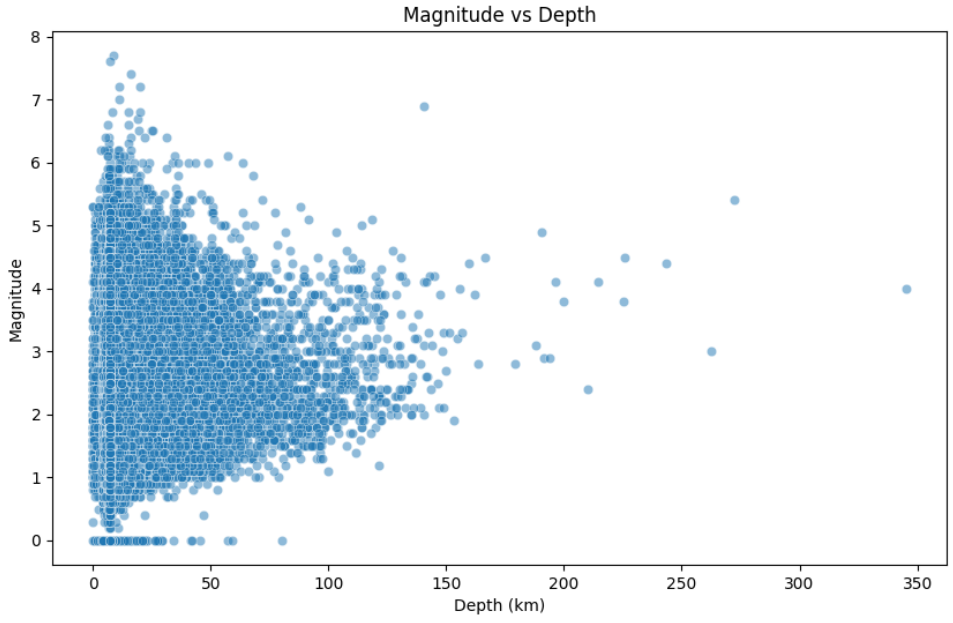


Yearly Distribution

Multivariate Analysis

Magnitude vs Depth

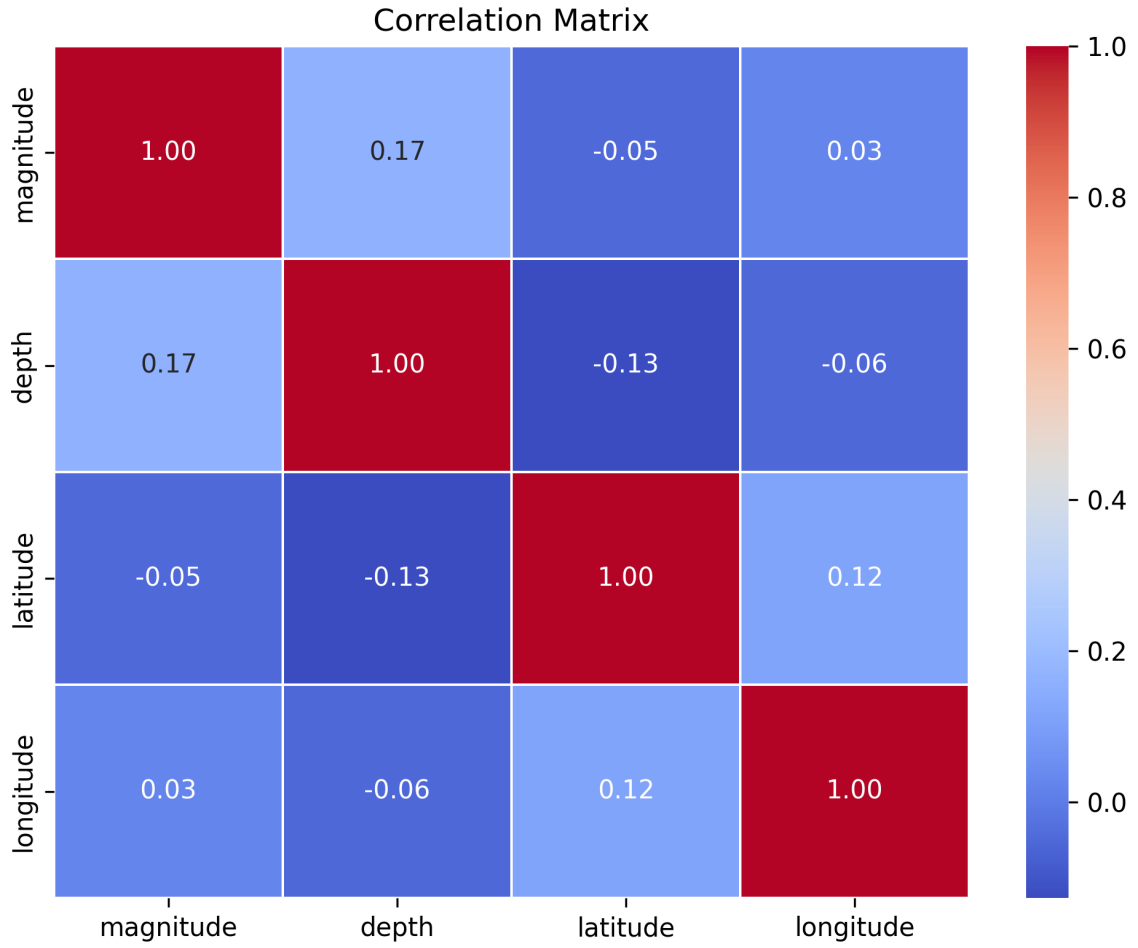
There doesn't appear to be a strong linear correlation between magnitude and depth, but larger earthquakes can occur at various depths.



Magnitude vs Depth

Correlation Analysis

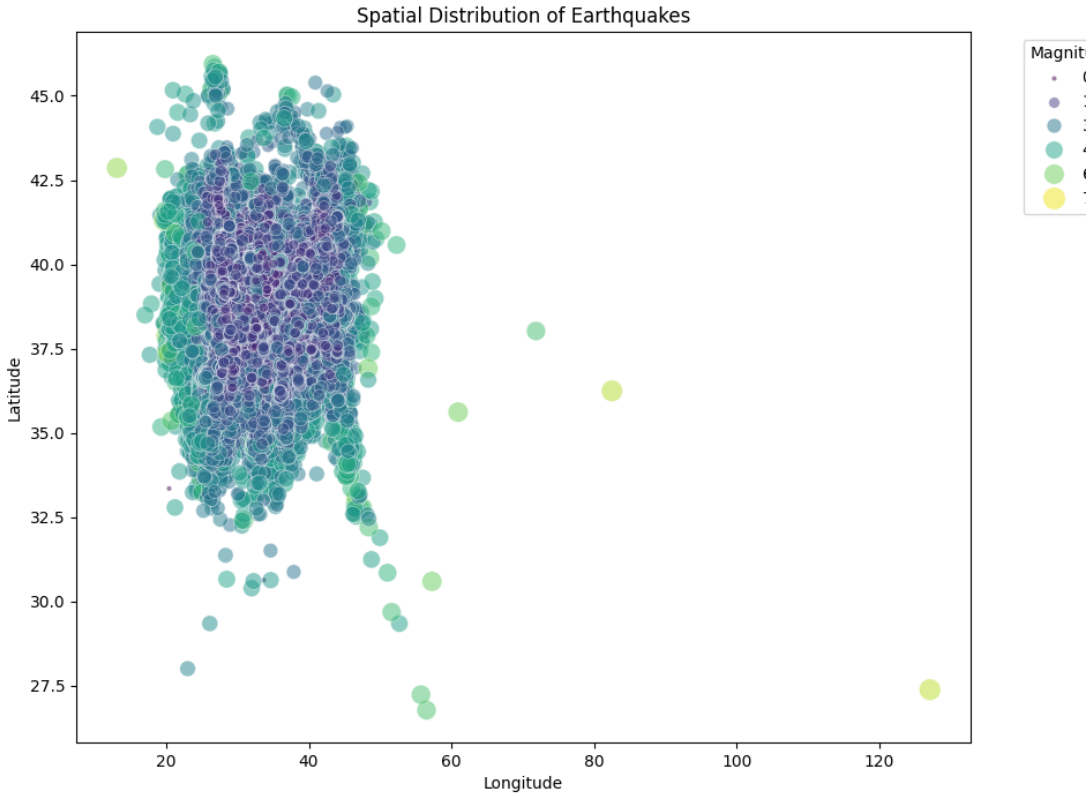
The correlation matrix shows the relationships between numeric variables.



Correlation Heatmap

Spatial Distribution

The spatial distribution plot clearly shows the major fault lines in Turkey.



Spatial Distribution