In [53]:
```
## Bitcoin Market Sentiment vs Trader Performance Analysis ##
```

In [55]:
```
# 1. Import Libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [57]:
```
# 2. Load Data
sentiment_df = pd.read_csv("fear_greed_index.csv")
sentiment_df
```

Out[57]:

	timestamp	value	classification	date
0	1517463000	30	Fear	2018-02-01
1	1517549400	15	Extreme Fear	2018-02-02
2	1517635800	40	Fear	2018-02-03
3	1517722200	24	Extreme Fear	2018-02-04
4	1517808600	11	Extreme Fear	2018-02-05
...	...	...	...	...
2639	1745818200	54	Neutral	2025-04-28
2640	1745904600	60	Greed	2025-04-29
2641	1745991000	56	Greed	2025-04-30
2642	1746077400	53	Neutral	2025-05-01
2643	1746163800	67	Greed	2025-05-02

2644 rows × 4 columns

In [59]:
```
trader_df = pd.read_csv("historical_data.csv")
trader_df
```

Out[59]:

	Account	Coin	Execution Price	Size Tokens	Size USD	Side	Timestamp IST	Start Position	Direction	Closed PnL	Transaction Hash	Order ID	Crossed
0	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9769	986.87	7872.16	BUY	02-12-2024 22:50	0.000000	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
1	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9800	16.00	127.68	BUY	02-12-2024 22:50	986.524596	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
2	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9855	144.09	1150.63	BUY	02-12-2024 22:50	1002.518996	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
3	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9874	142.98	1142.04	BUY	02-12-2024 22:50	1146.558564	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
4	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9894	8.73	69.75	BUY	02-12-2024 22:50	1289.488521	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
...	...	...	...	...	...	...	...	...	...	...	...	...	...
211219	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	382.20	420.80	SELL	25-04-2025 15:35	7546.600000	Close Long	-20.2566	0xcd339c08dc7b615a993c0422374d8e02027400092bc2...	88803313862	False
211220	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	2124.10	2338.63	SELL	25-04-2025 15:35	7164.400000	Close Long	-112.5773	0x29e8ede2a3a37aa0eac00422374d8e02029b00ac9f3c...	88803313862	False
211221	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	423.40	466.16	SELL	25-04-2025 15:35	5040.300000	Close Long	-22.4402	0x0780085b0c0a943eea800422374d92020 4c100edf579...	88803313862	False
211222	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	3599.80	3963.38	SELL	25-04-2025 15:35	4616.900000	Close Long	-190.7894	0x349c29934913b25c89e20422374d9202044cd008b8a0e...	88803313862	False
211223	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	1017.10	1119.83	SELL	25-04-2025 15:35	1017.100000	Close Long	-53.9063	0xac77fab973c455d77a670423374d96020398001f178c...	88803313862	False

211224 rows × 16 columns

In [60]:
```
# 3. Preprocess Sentiment Data
sentiment_df['date'] = pd.to_datetime(sentiment_df['date'])
```

In [63]:
```
# 4. Preprocess Trader Data
trader_df['Timestamp IST'] = pd.to_datetime(trader_df['Timestamp IST'], format='%d-%m-%Y %H:%M')
trader_df['date'] = trader_df['Timestamp IST'].dt.date
trader_df['date'] = pd.to_datetime(trader_df['date'])
```

In [65]:
```
# 5. Merge Data on Date
merged_df = pd.merge(trader_df, sentiment_df[['date', 'classification', 'value']], on='date', how='left')
merged_df
```

Out[65]:

	Account	Coin	Execution Price	Size Tokens	Size USD	Side	Timestamp IST	Start Position	Direction	Closed PnL	Transaction Hash	Order ID	Crossed
0	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9769	986.87	7872.16	BUY	2024-12-02 22:50:00	0.000000	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
1	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9800	16.00	127.68	BUY	2024-12-02 22:50:00	986.524596	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
2	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9855	144.09	1150.63	BUY	2024-12-02 22:50:00	1002.518996	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
3	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9874	142.98	1142.04	BUY	2024-12-02 22:50:00	1146.558564	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
4	0xae5eacaf9db931111fd53034a602c192a04e082ed	@107	7.9894	8.73	69.75	BUY	2024-12-02 22:50:00	1289.488521	Buy	0.0000	0xec09451986a1874e3a980418412fcd0201f500c95bac...	52017706630	True
...	...	...	...	...	...	...	...	...	...	...	...	...	...
211219	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	382.20	420.80	SELL	2025-04-25 15:35:00	7546.600000	Close Long	-20.2566	0xcd339c08dc7b615a993c0422374d8e02027400092bc2...	88803313862	False
211220	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	2124.10	2338.63	SELL	2025-04-25 15:35:00	7164.400000	Close Long	-112.5773	0x29e8ede2a3a37aa0eac00422374d8e02029b00ac9f3c...	88803313862	False
211221	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	423.40	466.16	SELL	2025-04-25 15:35:00	5040.300000	Close Long	-22.4402	0x0780085b0c0a943eea800422374d92020 4c100edf579...	88803313862	False
211222	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	3599.80	3963.38	SELL	2025-04-25 15:35:00	4616.900000	Close Long	-190.7894	0x349c29934913b25c89e20422374d9202044cd008b8a0e...	88803313862	False
211223	0x72743ae2822ed658c0c50608fd7c5c501b2afbd	FARTCOIN	1.1010	1017.10	1119.83	SELL	2025-04-25 15:35:00	1017.100000	Close Long	-53.9063	0xac77fab973c455d77a670423374d96020398001f178c...	88803313862	False

211224 rows × 19 columns

In [67]:
```
# 6. Analysis: Average Closed PnL by Sentiment
avg_pnl_by_sentiment = merged_df.groupby('classification')['Closed PnL'].mean().sort_values()
avg_pnl_by_sentiment
```

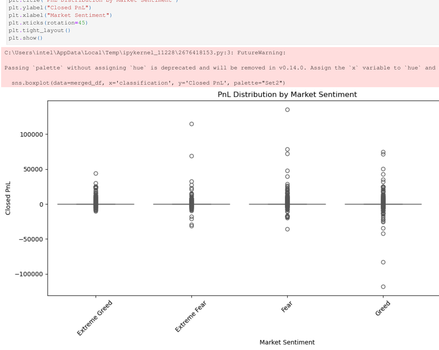
Out[67]:
```
classification
Neutral         34.307718
Extreme Fear    34.537862
Greed           43.761559
Fear            54.290400
Extreme Greed   67.892861
Name: Closed PnL, dtype: float64
```

In [69]:
```
# 7. Plot Average Closed PnL
plt.figure(figsize=(10, 5))
sns.barplot(x=avg_pnl_by_sentiment.index, y=avg_pnl_by_sentiment.values, palette="coolwarm")
plt.title("Average Closed PnL by Market Sentiment")
plt.ylabel("Average Closed PnL")
plt.xlabel("Market Sentiment")
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\intel\AppData\Local\Temp\ipykernel_11228\1617495708.py:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(x=avg_pnl_by_sentiment.index, y=avg_pnl_by_sentiment.values, palette="coolwarm")
```

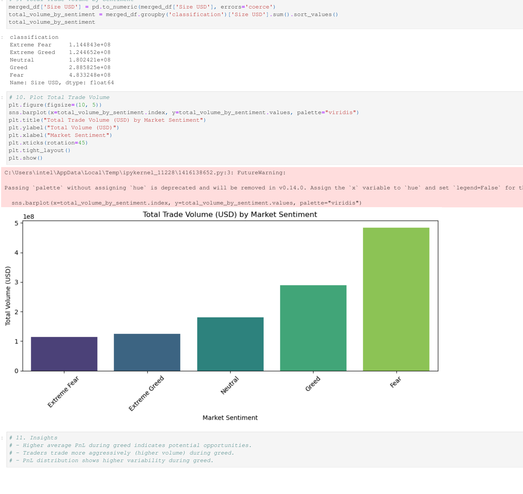


In [71]:
```
# 8. Distribution of PnL by Sentiment
plt.figure(figsize=(12, 6))
sns.boxplot(data=merged_df, x='classification', y='Closed PnL', palette="Set2")
plt.title("PnL Distribution by Market Sentiment")
plt.ylabel("Closed PnL")
plt.xlabel("Market Sentiment")
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\intel\AppData\Local\Temp\ipykernel_11228\2676418153.py:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.boxplot(data=merged_df, x='classification', y='Closed PnL', palette="Set2")
```



In [73]:
```
# 9. Total Trade Volume by Sentiment
merged_df['Size USD'] = pd.to_numeric(merged_df['Size USD'], errors='coerce')
total_volume_by_sentiment = merged_df.groupby('classification')['Size USD'].sum().sort_values()
total_volume_by_sentiment
```

Out[73]:
```
classification
Extreme Fear     1.144883e+08
Extreme Greed    1.244652e+08
Neutral          1.802421e+08
Greed            2.885825e+08
Fear             4.833248e+08
Name: Size USD, dtype: float64
```

In [75]:
```
# 10. Plot Total Trade Volume
plt.figure(figsize=(10, 5))
sns.barplot(x=total_volume_by_sentiment.index, y=total_volume_by_sentiment.values, palette="viridis")
plt.title("Total Trade Volume (USD) by Market Sentiment")
plt.ylabel("Total Volume (USD)")
plt.xlabel("Market Sentiment")
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\intel\AppData\Local\Temp\ipykernel_11228\1416136652.py:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(x=total_volume_by_sentiment.index, y=total_volume_by_sentiment.values, palette="viridis")
```


In [77]:
```
# 11. Insights
# - Higher average PnL during greed indicates potential opportunities.
# - Traders trade more aggressively (higher volume) during greed.
# - PnL distribution shows higher variability during greed.
```

In [79]:
```
## END Assignment ##
```