**EDA of Commodites**

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Crude Oil, Natural Gas, Heating Oil, RROB Gasoline, Brent Crude Oil & Other Fuels Futures Data.

Historical data on Fuels and Energy Futures like Oil or Gas from Kaggle

Link To Dataset - <https://www.kaggle.com/datasets/guillemservera/fuels-futures-data>

**About Dataset:**

This dataset provides comprehensive and up-to-date information on futures related to oil, gas, and other fuels. Futures are financial contracts obligating the buyer to purchase and the seller to sell a specified amount of a particular fuel at a predetermined price and future date.

**Use Cases:**

Trend Analysis: Scrutinize patterns and price fluctuations to anticipate future market directions in the energy sector.

Academic Research: Delve into the historical behavior of oil and gas prices and understand the influence of global events on these commodities.

Trading Strategies: Develop and test trading tactics based on the dynamics of oil, gas, and other fuel futures.

Risk Management: Utilize the dataset for hedging and risk management for corporations involved in the extraction, refining, or trading of fuels.

**Column Descriptions:**

Date: The date when the data was documented. Format: YYYY-MM-DD.

Open: Market's opening price for the day.

High: Peak price during the trading window.

Low: Lowest traded price during the day.

Close: Price at which the market closed.

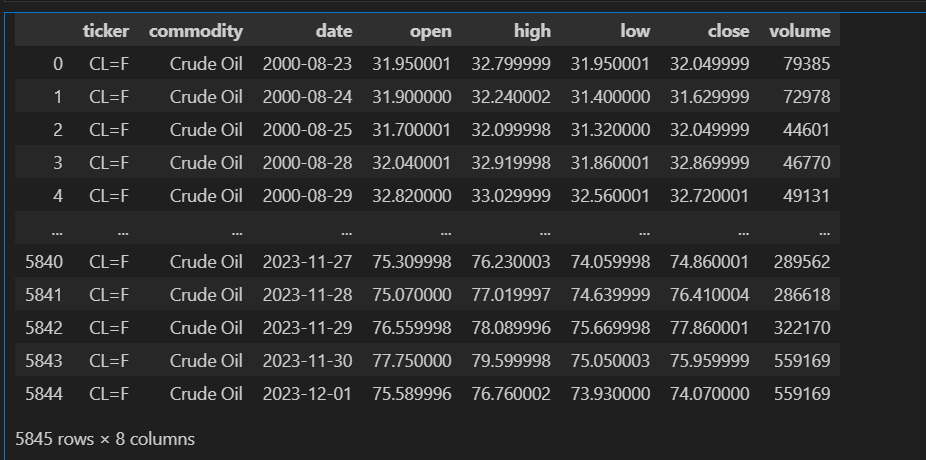
Volume: Number of contracts exchanged during the trading period.

Ticker: The unique market quotation symbol for the future.

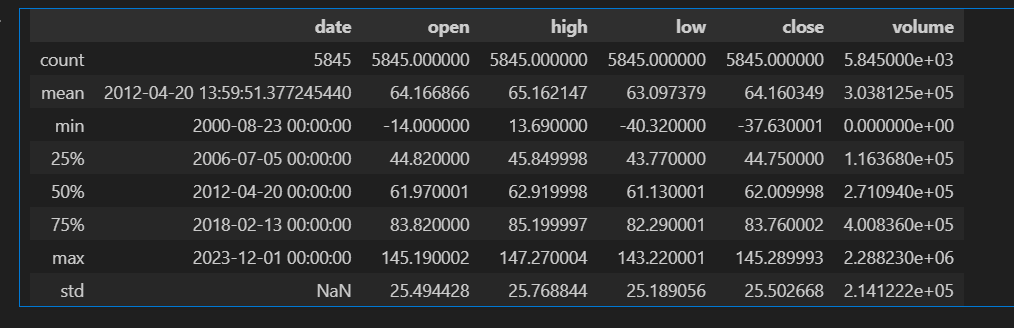
Commodity: Specifies the type of fuel the future contract pertains to (e.g., crude oil, natural gas)

**1.Crude Oil EDA**

**Data-frame:**

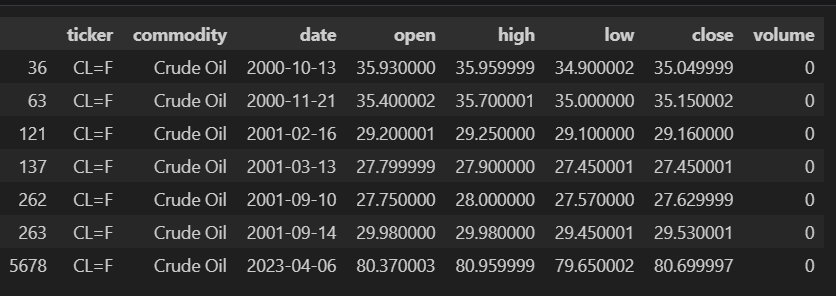
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**Statistics of Dataset:**

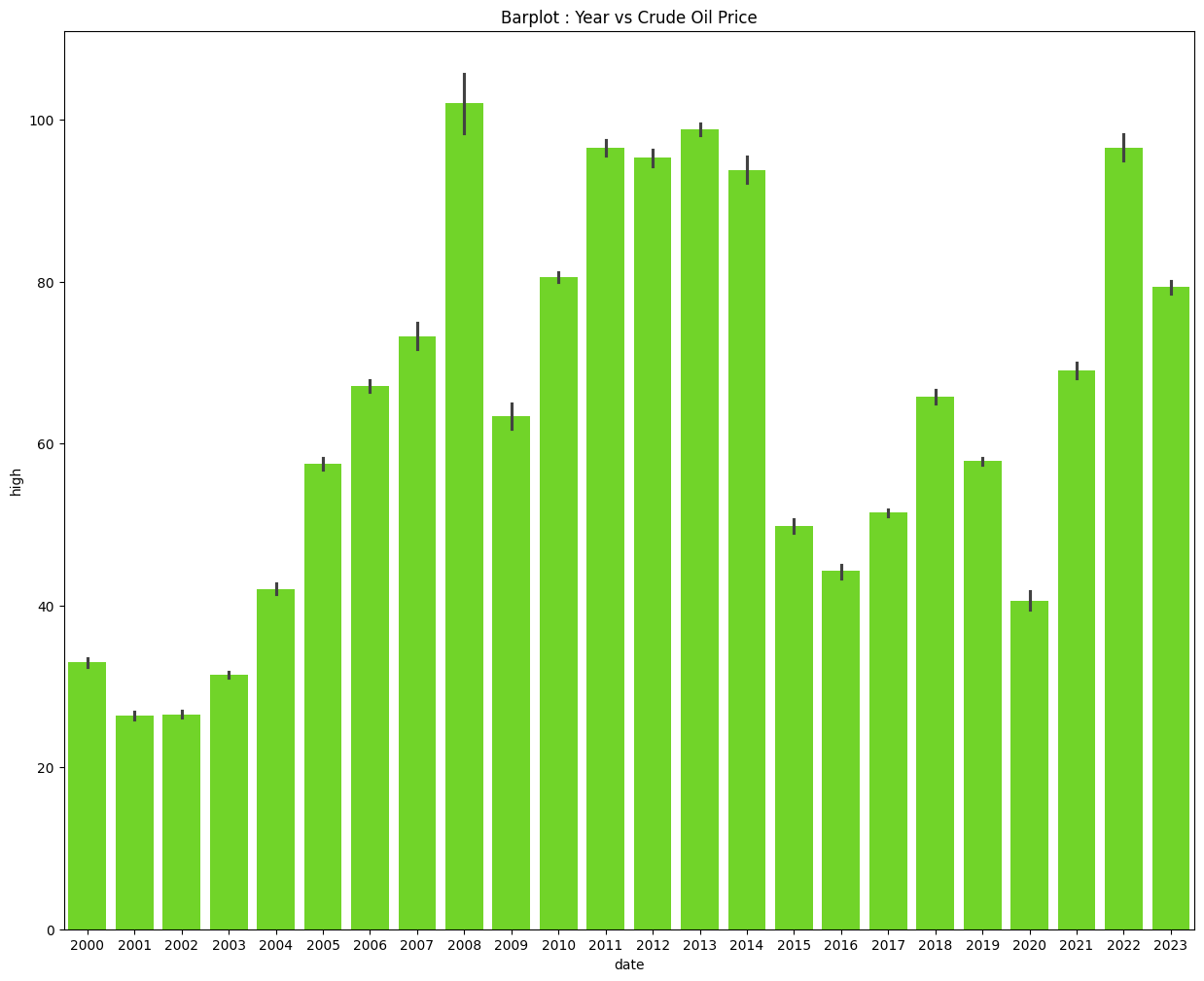
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**Highlights of Statistics:**

* Crude Oil price was at its Peak on 2008-07-03 .
* Crude Oil price was at its Low on 2020-04-20.
* Mean Crude Oil High Price is $65.162147.
* STD of Crude Oil is around $25.
* Maximum Volume Crude Oil Traded is 2288230.
* On this dates Crude Oil was not traded.



**Barplot : Year vs Crude Oil Prices :**

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**Highlights:**

* In Year 2008 Peak of Crude Oil was Recorded.
* In Year 2020 Low of Crude Oil was Recorded.
* Balanced Years were 2011,2012,2013,2014,2022
* Prices Of Crude Oil were low in year 2004,2015,2017,2020

Crude oil: Year 2008

The high crude oil prices in 2008 were influenced by a combination of factors, contributing to a significant spike in the cost of oil during that period. Some key factors include:

1. Global Economic Growth: In the years leading up to 2008, there was robust global economic growth, particularly in emerging economies like China and India. Increased economic activity typically leads to higher demand for energy, including oil.

2. Weak U.S. Dollar: The U.S. dollar experienced a period of weakness in the mid-2000s. Since oil is priced in U.S. dollars globally, a weaker dollar made oil more affordable for countries using other currencies, contributing to increased global demand.

3. Supply and Demand Imbalance: There was a perceived imbalance between global oil supply and demand. Rapid economic growth in emerging markets, coupled with increased industrialization and urbanization, led to higher oil consumption. At the same time, there were concerns about the adequacy of oil production capacity to meet this growing demand.

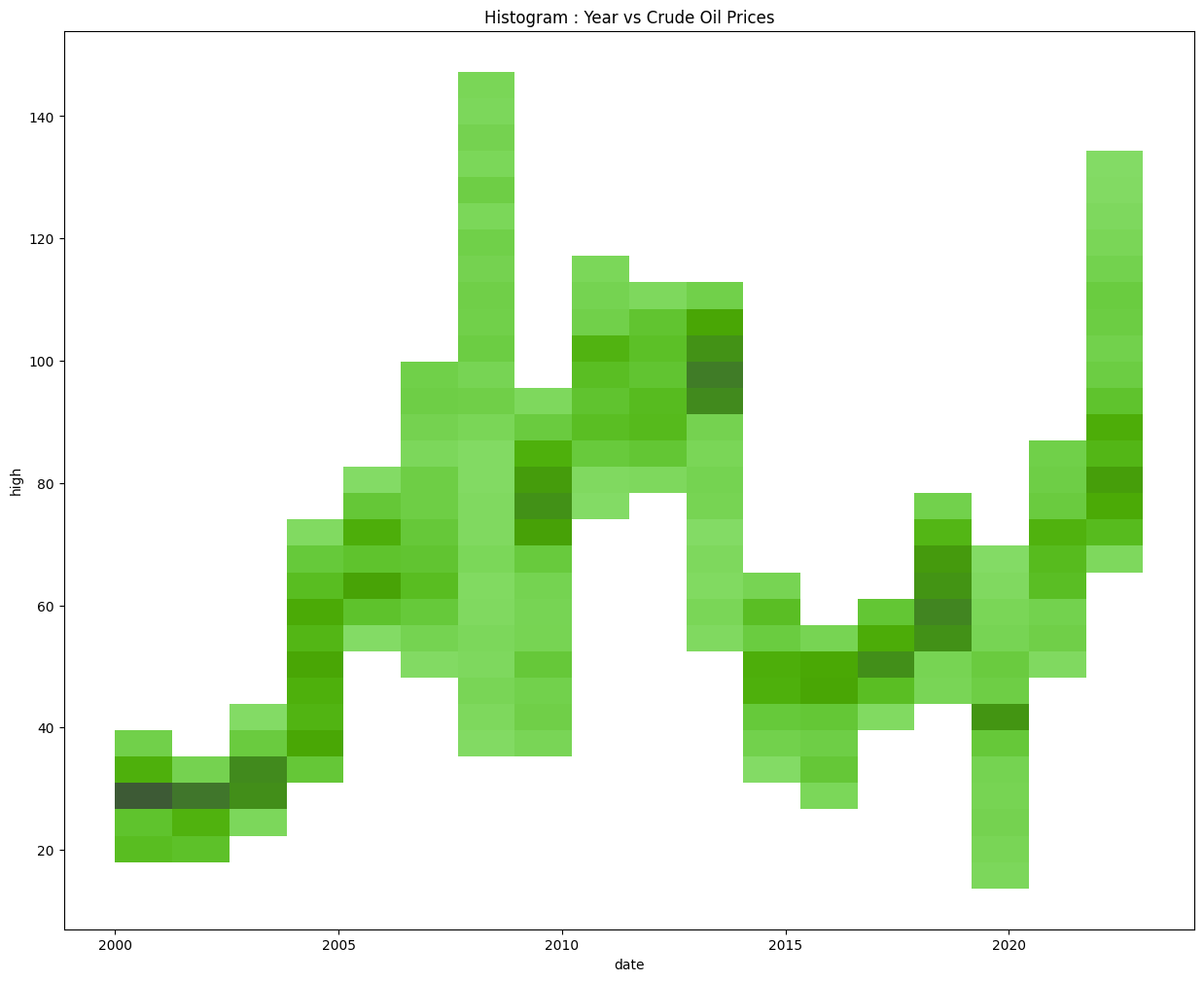
4. Geopolitical Tensions: Geopolitical factors, including tensions in oil-producing regions, contributed to concerns about potential disruptions in the oil supply. Unrest in the Middle East, particularly in Iraq and Iran, raised concerns about the stability of oil production in the region.

5. Financial Speculation: The commodities market experienced increased financial speculation, with investors seeking returns in the commodities sector. This speculative activity contributed to higher oil prices as investors bet on the continued rise in demand.

6. OPEC Production Cuts: The Organization of the Petroleum Exporting Countries (OPEC) implemented production cuts in an attempt to support higher oil prices. These cuts, combined with geopolitical uncertainties, added upward pressure on prices.

7. Infrastructure and Refining Constraints: Bottlenecks in oil infrastructure, including refining capacity, also played a role. Limited refining capacity in some regions created concerns about the ability to convert crude oil into usable products.

The combination of these factors created a perfect storm for soaring oil prices in 2008. However, it's essential to note that the situation changed dramatically later in the year and into 2009. The global financial crisis and economic downturn led to a sharp contraction in demand for oil, causing prices to collapse from their mid-2008 highs. By the end of 2008, oil prices had fallen significantly from their peak levels.



**Crude Oil : Year 2011-2014**

The stability in crude oil prices from 2011 to 2014 can be attributed to a combination of factors that balanced the global oil market during that period. Some key factors include:

1. Global Economic Recovery: Following the global financial crisis of 2008, there was a gradual recovery in the global economy. Economic growth, particularly in emerging markets, increased demand for oil. However, this growth was not so rapid as to create significant imbalances in supply and demand.

2. Increased Oil Production: During this period, there were advancements in oil extraction technologies, particularly in the United States through the development of hydraulic fracturing (fracking) techniques. This led to a surge in U.S. oil production, contributing to a more abundant global oil supply.

3. OPEC Production Levels: The Organization of the Petroleum Exporting Countries (OPEC) generally maintained stable production levels during this period. While there were occasional fluctuations, OPEC countries collectively worked to manage oil production to avoid drastic price swings.

4. Geopolitical Stability: Compared to some periods of the past and future, geopolitical tensions and disruptions were relatively lower during the years from 2011 to 2014. This stability reduced concerns about potential disruptions in global oil supply.

5. Dollar Stability: The U.S. dollar remained relatively stable during this time, which also contributed to a steady oil market. Since oil is priced in U.S. dollars, a stable dollar can help maintain a sense of predictability in oil prices.

6. Global Oil Inventories: Adequate global oil inventories helped mitigate concerns about sudden shortages. The stability in inventories was partly due to the relatively balanced supply and demand dynamics during this period.

7. Demand Growth Matching Supply Increases: The gradual recovery of the global economy and the increase in oil production were, to a large extent, balanced by a corresponding rise in demand. This matching of supply and demand growth contributed to a more stable pricing environment.

It's important to note that while prices remained relatively stable during this period, they are still influenced by various factors and can fluctuate based on changes in the geopolitical landscape, economic conditions, technological advancements, and other unforeseen events. After 2014, the dynamics in the oil market started to shift again, leading to fluctuations in oil prices in subsequent years.

**Crude Oil : Year 2015-2017**

The significant drop in crude oil prices from 2014 to 2017 can be attributed to a combination of factors that created a substantial imbalance between global oil supply and demand. Some key factors include:

1. Oversupply and Shale Revolution: One of the primary drivers was the substantial increase in oil production, particularly from the United States, driven by the shale revolution. Advances in hydraulic fracturing (fracking) and horizontal drilling allowed the U.S. to extract oil from shale formations, leading to a surge in domestic production. This added significant volumes to the global oil market, contributing to oversupply.

2. OPEC Decision Not to Cut Production: In November 2014, the Organization of the Petroleum Exporting Countries (OPEC), led by Saudi Arabia, decided not to reduce oil production levels in response to the oversupply. Instead, OPEC maintained its production levels in an attempt to protect its market share and, in some interpretations, to make shale oil production less economically viable.

3. Geopolitical Tensions: The annexation of Crimea by Russia in March 2014 escalated geopolitical tensions in the region. The move was widely condemned by the international community, leading to sanctions imposed on Russia by Western nations, including the United States and the European Union.

4. Russian Energy Exports: Russia is a major exporter of oil and natural gas, and any geopolitical tensions involving Russia can raise concerns about potential disruptions to its energy exports. These concerns may contribute to higher oil prices as traders factor in a risk premium.

5. Strong U.S. Dollar: The U.S. dollar strengthened during this time, making oil more expensive for countries using other currencies. This had a dampening effect on global oil demand.

6. Market Reaction: Following the annexation of Crimea, there was a short-lived spike in oil prices as markets reacted to the geopolitical uncertainties. However, the impact on oil prices was relatively limited compared to other factors influencing the market at the time.

The combination of these factors led to a significant oversupply of oil in the global market, causing prices to plummet. The price of crude oil dropped from over $100 per barrel in mid-2014 to below $30 per barrel in early 2016. The period from 2014 to 2017 marked a challenging time for oil-producing countries and companies, as they had to adjust to the new market realities and lower oil prices.