Factors influencing the Residential home prices across U.S the most(last 20 years) :

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Supply Factors:

1. Construction Spending
2. Available Homes
3. Building Permits
4. Median Sale Price

Data source-
https://fred.stlouisfed.org

Demand Factors:

1. USA GDP
2. Unemployment
3. Mortgage Rates
4. Median Earning

Data source-
https://fred.stlouisfed.org

Demand Data:

	DATE	GDP	Median_Earnings	MORTGAGE_Rates(%)	Unemplyment(%)
1	DATE	GDP	Median_Earnings	MORTGAGE_Rates(%)	Unemplyment(%)
2	01-01-2003	13619.43	615	5.84	5.87
3	01-04-2003	13741.11	619	5.51	6.13
4	01-07-2003	13970.16	621	6.03	6.13
5	01-10-2003	14131.38	623	5.92	5.83
6	01-01-2004	14212.34	629	5.6	5.7
7	01-04-2004	14323.02	642	6.11	5.6
8	01-07-2004	14457.83	635	5.89	5.43
9	01-10-2004	14605.6	646	5.74	5.43
10	01-01-2005	14767.85	647	5.77	5.3
11	01-04-2005	14839.71	647	5.71	5.1
12	01-07-2005	14956.29	651	5.76	4.97
13	01-10-2005	15041.23	658	6.23	4.97
14	01-01-2006	15244.09	662	6.25	4.73
15	01-04-2006	15281.53	663	6.6	4.63
16	01-07-2006	15304.52	678	6.56	4.63
17	01-10-2006	15433.64	681	6.24	4.43
18	01-01-2007	15478.96	687	6.21	4.5
19	01-04-2007	15577.78	693	6.36	4.5
20	01-07-2007	15671.61	698	6.55	4.67
21	01-10-2007	15767.15	700	6.22	4.8
22	01-01-2008	15702.91	713	5.87	5
23	01-04-2008	15792.77	722	6.09	5.33
24	01-07-2008	15709.56	724	6.32	6
25	01-10-2008	15366.61	727	5.84	6.87
26	01-01-2009	15187.48	732	5.06	8.27
27	01-04-2009	15161.77	737	5.01	9.3
28	01-07-2009	15216.65	742	5.16	9.63
29	01-10-2009	15379.16	747	4.92	9.93

Demand Data

Supply Data:

DATE	Construction_Spending	Median_Sale_price	PERMIT	Available_Homes
01-01-2003	863855	181700	1808	1654
01-02-2003	859225	187000	1854	1688
01-03-2003	851132	185100	1757	1638
01-04-2003	859459	189500	1803	1662
01-05-2003	866814	195500	1835	1733
01-06-2003	880865	187900	1875	1641
01-07-2003	891264	190200	1885	1680
01-08-2003	901839	190500	1966	1570
01-09-2003	911589	192000	1961	1719
01-10-2003	925732	194100	2012	1728
01-11-2003	925985	207100	1918	1692
01-12-2003	948491	196000	1987	1716
01-01-2004	938525	209500	1952	1709
01-02-2004	937813	219600	1966	1718
01-03-2004	961159	209600	2066	1794
01-04-2004	967602	222300	2070	1938
01-05-2004	974381	211700	2150	1893
01-06-2004	983087	215700	2020	1857
01-07-2004	1006184	212400	2112	1881
01-08-2004	1013616	218100	2056	1911
01-09-2004	1012080	211600	2041	1796
01-10-2004	1015719	229200	2097	1839
01-11-2004	1022994	224500	2079	1758
01-12-2004	1037480	229600	2082	1921
01-01-2005	1046082	223100	2139	1892
01-02-2005	1066848	237300	2114	1908
01-03-2005	1071745	229300	2062	1787
01-04-2005	1081012	236300	2150	1927

Supply_Data

Model Preparation:

	model	best_score	best_params
0	linear_regression	0.989201	{}
1	lasso	0.987512	{'alpha': 1, 'selection': 'cyclic'}
2	decision_tree	0.984791	{'criterion': 'friedman_mse', 'splitter': 'ran...
3	Random_forest	0.988611	{'max_features': 'log2', 'n_estimators': 700}
4	GradientBoostingRegressor()	0.987594	{}

Linear_regression Model came out with the best result and hence our model was built on it.

Multivariable Regression Equation :

Y(HPI) =-105.0920945056065 + ((0.00010521880234370685 * **Construction_Spending**) + (0.00024336966155251742 * **Median_Sale_price**) + (0.007119514508761982 * **PERMIT**) + -0.01240970448293741 * **Available_Homes**) + (0.006776578686678256 * **GDP**) + (-0.08345488979271427* **Median_Earnings**) + (8.26607678053101* **MORTGAGE_Rates(%)**) + (2.9367223347201112 * **Unemplyment (%)**)

[Home Price Model](#)

Conclusion:

- GDP , House_Permit , Mortgage rates and unemployment has higher positive impact on House Price which is directly increases as price .
- Available_homes and Median_Earnings has Negative impact on prices.
- It shows that increase in available house decreases the price of house .
- However, it's crucial to remember that real-world housing markets are influenced by numerous other factors, and this equation provides a simplified representation of these relationships. Further analysis and consideration of local market dynamics are often necessary for accurate predictions.