3 FINLATICS CASE PROJECT 3 / ABDUL RAHMAN

Situation : The below represents the option chain data of a Stock Index. It is one of the most popularly traded indexes in the Indian market. We have provided you with two different time period data for market analysis. Please find the attached data:

CALL					PUT			
OI	CHNG IN OI	IV	LTP	**STRIKE**	LTP	IV	CHNG IN OI	OI
26,476	3,347	40.55	649.35	**19,000.00**	1.25	29.67	23,075	2,07,101
151	-61	-	595.3	**19,050.00**	1.4	27.81	4,791	27,615
1,778	-43	35.38	558.55	**19,100.00**	1.5	26.15	23,123	72,345
266	-3	27.69	496.65	**19,150.00**	1.65	24.52	6,551	38,101
3,142	128	29.03	449.7	**19,200.00**	1.9	22.79	51,343	1,56,071
1,817	-45	26.6	399.15	**19,250.00**	2.25	21.12	13,598	62,592
16,448	229	27.19	350.8	**19,300.00**	2.85	19.52	58,171	1,52,475
1,839	683	24.15	300.2	**19,350.00**	3.65	17.93	34,031	79,276
18,122	2,731	21.92	252.3	**19,400.00**	5.2	16.48	48,107	1,63,894
7,785	3,977	19.59	204.55	**19,450.00**	8.05	15.26	36,953	1,05,992
65,524	32,148	17.7	159.55	**19,500.00**	13	14.36	1,07,889	2,79,530
37,656	27,126	16.15	117.2	**19,550.00**	20.7	13.39	89,271	1,74,300
1,51,436	94,295	14.89	80	**19,600.00**	33.6	12.62	1,63,027	3,38,542
1,57,580	79,309	14.11	50.45	**19,650.00**	53.9	12.07	16,150	1,30,006
3,00,865	90,476	13.59	28.75	**19,700.00**	82.2	11.54	-279	1,35,285
1,92,880	63,584	13.39	14.9	**19,750.00**	118.25	10.8	-295	28,896
3,13,997	48,874	13.69	7.9	**19,800.00**	161.25	9.63	-10,238	66,718
1,45,761	31,725	13.93	4.05	**19,850.00**	207.65	-	-4,011	9,984
2,23,031	40,826	14.56	2.45	**19,900.00**	256	-	-4,397	32,821
1,03,959	24,872	15.57	1.75	**19,950.00**	304.8	-	-957	6,162
2,33,694	493	16.74	1.4	**20,000.00**	354.55	-	-4,810	32,747

Figure 1: First half of the market

CALL					PUT			
OI	CHNG IN OI	IV	LTP	**STRIKE**	LTP	IV	CHNG IN OI	OI
26,225	3,096	-	700.45	**19,000.00**	1.25	30.2	27,213	2,11,239
124	-88	30.61	649.9	**19,050.00**	1.25	28.44	5,068	27,892
1,740	-81	30.3	598.4	**19,100.00**	1.35	26.93	24,510	73,732
259	-10	30.31	554.9	**19,150.00**	1.55	25.21	10,941	42,491
2,991	-23	-	496.25	**19,200.00**	1.7	23.54	43,749	1,48,477
1,742	-120	-	449.25	**19,250.00**	1.95	22.08	13,609	62,603
16,248	29	-	399.2	**19,300.00**	2.35	20.53	60,276	1,54,580
1,688	532	-	347.5	**19,350.00**	2.8	19.02	43,225	88,470
16,586	1,195	-	300	**19,400.00**	3.55	17.55	52,122	1,67,909
6,178	2,370	13.03	251.3	**19,450.00**	4.55	15.96	71,555	1,40,594
56,923	23,547	11.94	202.9	**19,500.00**	6.9	14.88	1,12,187	2,83,828
23,296	12,766	12.61	156.9	**19,550.00**	10.75	13.83	72,829	1,57,858
99,620	42,479	11.95	113.3	**19,600.00**	17.7	12.97	1,87,761	3,63,276
1,04,216	25,945	11.49	75.45	**19,650.00**	29.45	12.25	1,16,500	2,30,356
2,71,561	61,172	11.2	45.25	**19,700.00**	49.2	11.9	1,09,775	2,45,339
1,97,099	67,803	11.15	24.4	**19,750.00**	78.2	11.93	17,112	46,303
3,34,652	69,529	11.35	12.15	**19,800.00**	116.2	12.26	-18	76,938
1,56,865	42,829	11.56	5.65	**19,850.00**	159.7	13.27	-2,363	11,632
2,34,323	52,118	12.2	2.95	**19,900.00**	206	14.2	-6,094	31,124
88,078	8,991	13.13	1.8	**19,950.00**	253.75	17.07	-1,188	5,931
2,34,054	853	14.46	1.35	**20,000.00**	304.15	18.62	-4,185	33,372

Figure 2: Second half of the market

ANALYSIS 1

Looking at the given option chain data, To calculate the Put Call ratio for the 1st and 2nd half and give an appropriate interpretation of the sentiment in the market.

PUT-CALL RATIO CALCULATION

The Put-Call Ratio (PCR) is calculated using the formula:

$$\text{PCR} = \frac{\text{Total Open Interest of Puts}}{\text{Total Open Interest of Calls}}$$

First Half

CALL Options

$$\begin{aligned}\text{Total Open Interest} &= 26,476 + 151 + 1,778 + 266 + 3,142 + 1,817 + 16,448 + 1,839 \\ &\quad + 18,122 + 7,785 + 65,524 + 37,656 + 151,436 + 157,580 + 300,865 \\ &\quad + 192,880 + 313,997 + 145,761 + 223,031 + 103,959 + 233,694 \\ &= 2,004,207\end{aligned}$$

PUT Options

$$\begin{aligned}\text{Total Open Interest} &= 207,101 + 27,615 + 72,345 + 38,101 + 156,071 + 62,592 + 152,475 \\ &\quad + 79,276 + 163,894 + 105,992 + 279,530 + 174,300 + 338,542 + \\ &\quad 130,006 + 135,285 + 28,896 + 66,718 + 9,984 + 32,821 \\ &\quad + 6,162 + 32,747 \\ &= 2,270,980\end{aligned}$$

PCR for the First Half

$$\text{PCR}_{\text{First Half}} = \frac{2,270,980}{2,004,207} \approx 1.133$$

Second Half

CALL Options

$$\begin{aligned}\text{Total Open Interest} &= 26,225 + 124 + 1,740 + 259 + 2,991 + 1,742 + 16,248 + 1,688 \\ &\quad + 16,586 + 6,178 + 56,923 + 23,296 + 99,620 + 104,216 + 271,561 \\ &\quad + 197,099 + 334,652 + 156,865 + 234,323 + 88,078 + 234,054 \\ &= 1,874,468\end{aligned}$$

PUT Options

$$\begin{aligned}\text{Total Open Interest} &= 211,239 + 27,892 + 73,732 + 42,491 + 148,477 + 62,603 + 154,580 + 88,470 \\ &\quad + 167,909 + 140,594 + 283,828 + 157,858 + 363,276 + 230,356 + 245,339 + 46,303 \\ &\quad + 76,938 + 11,632 + 31,124 + 5,931 + 33,372 \\ &= 2,603,944\end{aligned}$$

PCR for the Second Half

$$\text{PCR}_{\text{Second Half}} = \frac{2,603,944}{1,874,468} \approx 1.38916$$

INTERPRETATION OF MARKET SENTIMENT

- **First Half PCR (1.13)**: A PCR above 1 indicates that more puts are being traded relative to calls, suggesting a **bearish sentiment** as investors are hedging against potential downside.
- **Second Half PCR (1.39)**: Similarly, a PCR significantly above 1 in the second half also indicates a **bearish sentiment**. The higher PCR compared to the first half suggests even stronger bearish sentiment among investors.

ANALYSIS 2

Based on the data, to find out the support and resistance levels in the market.

SUPPORT AND RESISTANCE LEVELS

To identify support and resistance levels in the market based on the given option chain data, we analyze the Open Interest (OI) levels. High open interest at a particular strike price often indicates significant support or resistance levels.

Support Levels

Support levels are identified by the highest open interest in PUT options. These levels indicate where traders expect the index to find buying interest if it declines.

First Half PUT Options

- Strike Price 19,600: OI = 338,542
- Strike Price 19,500: OI = 279,530

- Strike Price 19,000: OI = 207,101

Second Half PUT Options

- Strike Price 19,600: OI = 363,276
- Strike Price 19,500: OI = 283,828
- Strike Price 19,000: OI = 211,239

The highest OI is at 19,600 for both halves, suggesting this is a strong support level.

Resistance Levels

Resistance levels are identified by the highest open interest in CALL options. These levels indicate where traders expect the index to face selling pressure if it rises.

First Half CALL Options

- Strike Price 19,800: OI = 313,997
- Strike Price 19,700: OI = 300,865
- Strike Price 20,000: OI = 233,694

Second Half CALL Options

- Strike Price 19,800: OI = 334,652
- Strike Price 19,700: OI = 271,561
- Strike Price 20,000: OI = 234,054

The highest OI is at 19,800 for both halves, suggesting this is a strong resistance level.

Summary

- **Support Level**: 19,600 (based on the highest PUT OI)
- **Resistance Level**: 19,800 (based on the highest CALL OI)

These levels indicate where the market might find support if prices fall (19,600) and where it might face resistance if prices rise (19,800).

ANALYSIS 3

Based on the above-given data, create a payoff table for any two suitable option trading strategies and explain the payoffs at different spot prices of the index. You can pick any two strategies that you wish to.

OPTION TRADING STRATEGIES PAYOFF TABLES

1. Long Call

Assumptions:

- Strike Price: 19,500
- Premium: 159.55

Payoff Calculation:

$$\text{Payoff} = \max(\text{Spot Price} - \text{Strike Price}, 0) - \text{Premium}$$

Payoff Table:

Spot Price	Payoff Calculation	Payoff
19,400	$\max(19,400 - 19,500, 0) - 159.55$	-159.55
19,500	$\max(19,500 - 19,500, 0) - 159.55$	-159.55
19,600	$\max(19,600 - 19,500, 0) - 159.55$	-59.55
19,700	$\max(19,700 - 19,500, 0) - 159.55$	40.45
19,800	$\max(19,800 - 19,500, 0) - 159.55$	140.45
19,900	$\max(19,900 - 19,500, 0) - 159.55$	240.45
20,000	$\max(20,000 - 19,500, 0) - 159.55$	340.45

2. Short Put

Assumptions:

- Strike Price: 19,500
- Premium: 6.9

Payoff Calculation:

$$\text{Payoff} = \text{Premium} - \max(\text{Strike Price} - \text{Spot Price}, 0)$$

Payoff Table:

Spot Price	Payoff Calculation	Payoff
19,400	$6.9 - \max(19,500 - 19,400, 0)$	-93.1
19,500	$6.9 - \max(19,500 - 19,500, 0)$	6.9
19,600	$6.9 - \max(19,500 - 19,600, 0)$	6.9
19,700	$6.9 - \max(19,500 - 19,700, 0)$	6.9
19,800	$6.9 - \max(19,500 - 19,800, 0)$	6.9
19,900	$6.9 - \max(19,500 - 19,900, 0)$	6.9
20,000	$6.9 - \max(19,500 - 20,000, 0)$	6.9

Explanation of Payoffs

Long Call

- **Break-Even Point**: The spot price needs to be $19,500 + 159.55 = 19,659.55$ for the strategy to break even.

- **Profit**: When the spot price exceeds 19,659.55, the strategy starts to make a profit.
- **Loss**: Limited to the premium paid (159.55), which occurs when the spot price is below 19,500.

Short Put

- **Break-Even Point**: The spot price needs to be $19,500 - 6.9 = 19,493.1$ for the strategy to break even.
- **Profit**: Limited to the premium received (6.9), which occurs when the spot price is above 19,500.
- **Loss**: Unlimited if the spot price goes below the strike price 19,500 .
