

CA-3

EDA PROJECT

- MULTIVARIATE ANALYSIS
- PREDICTION/CONCLUSION
- SUGGESTIONS

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ROLL NUM: 52

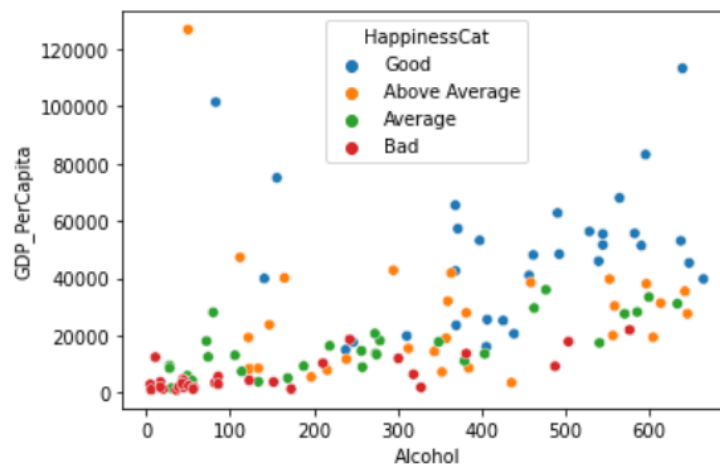
SECTION: K20CH

MULTIVARIATE ANALYSIS

1. Alcohol consumption Vs GDP Vs HappinessCat

```
In [59]: sns.scatterplot(inp1.Alcohol, inp1.GDP_PerCapita, hue= inp1.HappinessCat)
```

```
Out[59]: <AxesSubplot:xlabel='Alcohol', ylabel='GDP_PerCapita'>
```



Here we can see, mostly unhappy countries are low on GDP as well as alcohol consumption.

And happiest countries lie from 300-600L per capita Alcohol consumption

But there are still some countries will more than average alcohol consumption but are low in happiness index.

We can see an orange dot in left top corner, with highest GDP per capita and very low alcohol consumption, let's check

```
In [89]: inp1[inp1.GDP_PerCapita > 120000].Country
```

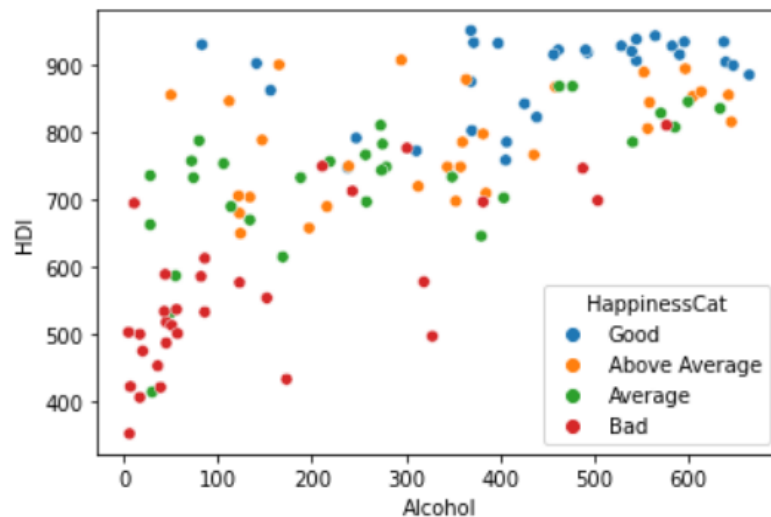
```
Out[89]: 32    Qatar
         Name: Country, dtype: object
```

Qatar has 120000+ GDP per capita and Above Average happiness index but are very low in alcohol consumption

2. Alcohol consumption Vs HDI Vs HappinessCat

```
In [61]: sns.scatterplot(inp1.Alcohol, inp1.HDI, hue= inp1.HappinessCat)
```

```
Out[61]: <AxesSubplot:xlabel='Alcohol', ylabel='HDI'>
```



Here we can see mostly Low HDI countries are consuming less alcohol and are also low in happiness index.

But we can't neglect there are a few countries which have high alcohol consumption but are still in sad category.

```
In [66]: inp1[(inp1.HappinessCat == "Bad") & (inp1.Alcohol > 300)].Country
```

```
Out[66]: 92      South Africa
          96      Ukraine
          99      Georgia
          102     Bulgaria
          105      Gabon
          107      Haiti
          112     Angola
          Name: Country, dtype: object
```

These are the countries whose alcohol consumption is more than average but are still in sad category

```
In [82]: print(f"\naverage HDI= {inp1.HDI.mean()}")
          print(f"average GDP per capita= {inp1.GDP_PerCapita.mean()}")
          inp1[(inp1.HappinessCat == "Bad") & (inp1.Alcohol > 300)][["Country", "HDI", "GDP_PerCapita"]]
```

```
average HDI= 740.8770491803278
average GDP per capita= 24430.95275328525
```

```
Out[82]:
```

	Country	HDI	GDP_PerCapita
92	South Africa	696	13686.882360
96	Ukraine	746	9249.462135
99	Georgia	776	12004.573830
102	Bulgaria	810	21960.369940
105	Gabon	698	17875.761150
107	Haiti	496	1866.617589
112	Angola	577	6452.355165

We can see all these countries have near average HDI but their GDP per capita is far less than average

Maybe that pushes them closer to unhappiness

PREDICTIONS AND CONCLUSIONS

1. WHAT ARE THE HAPPIEST COUNTRIES DRINKING?

```
In [99]: inp1[(inp1.HappinessCat == "Good") & (inp1.Alcohol > 300)]\
[["Country", "HappinessScore", "Beer_PerCapita", "Spirit_PerCapita", "Wine_PerCapita"]]\
.head(10).sort_values(by=['HappinessScore'], ascending=False)
```

Out[99]:

	Country	HappinessScore	Beer_PerCapita	Spirit_PerCapita	Wine_PerCapita
0	Denmark	7.526	224	81	278
1	Switzerland	7.509	185	100	280
2	Iceland	7.501	233	61	78
3	Norway	7.498	169	71	129
4	Finland	7.413	263	133	97
5	Canada	7.404	240	122	100
6	Netherlands	7.339	251	88	190
7	New Zealand	7.334	203	79	175
8	Australia	7.313	261	72	212
9	Sweden	7.291	152	60	186

Most countries drink beer in quite high proportion than other, wine takes the 2nd place.

2. What is the GDP and HDI of happiest countries

```
In [105]: inp1[(inp1.HappinessCat == "Good")]\n          [{"Country", "HDI", "GDP_PerCapita", "HappinessScore"}]\n          .head(10).sort_values(by=['HappinessScore'], ascending=False)
```

```
Out[105]:
```

	Country	HDI	GDP_PerCapita	HappinessScore
0	Denmark	928	55671.16527	7.526
1	Switzerland	943	68060.94105	7.509
2	Iceland	933	57303.06078	7.501
3	Norway	951	65510.58527	7.498
4	Finland	918	48416.93603	7.413
5	Canada	922	48130.25597	7.404
6	Netherlands	928	56328.94114	7.339
7	New Zealand	915	41005.42087	7.334
8	Australia	938	51663.36509	7.313
9	Sweden	932	53208.88436	7.291

We can see all the happiest countries have HDI over 900.

3. Correlation of GDP and HDI and Happiness Score

```
In [106]: inp1[(inp1.HappinessCat == "Good")]\n          [{"Country", "HDI", "GDP_PerCapita", "HappinessScore"}]\n          .head(10).sort_values(by=['HappinessScore'], ascending=False).corr()
```

```
Out[106]:
```

	HDI	GDP_PerCapita	HappinessScore
HDI	1.000000	0.875920	0.377822
GDP_PerCapita	0.875920	1.000000	0.615369
HappinessScore	0.377822	0.615369	1.000000

CONCLUSION

With all these analyses, we can say that MOST countries that consume high amount of alcohol tends to be happier than rest.

But there are many countries that are happy without consuming alcohol.

A relation we can see is that rich countries spend money on alcohol and are happy because people are rich and have a good lifestyle.

HDI and GDP has more effect on Happiness index than alcohol consumption.

Suggestions

To get better understanding on this, we need to take population and drinker's age density in country as data.

Many factors were missing for this study that we can add in future observations and get clearer results.