LEVERAGING DATA ANALYTICS TO OPTIMIZE MATERIAL CONSUMPTIONIN VIZG STEEL PLANT

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Introduction

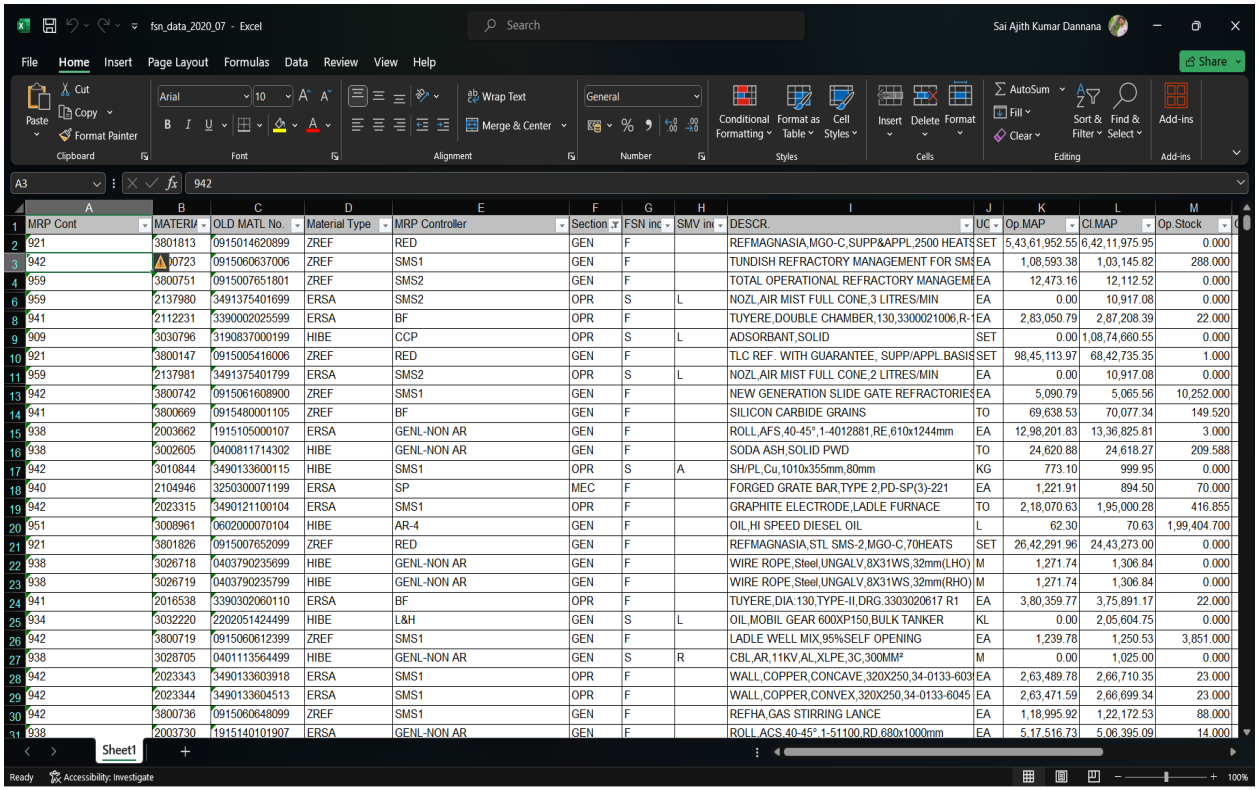
I had completed my Internship in Rastriya Ispat Nigam Limited, Vizag Steel Plant as Basic Data Analyst for optmizing the material consumption for production

Objectives of the project include

1. Analysing Historical Material Consumption Data
2. Representation of Material Consumption
3. Developing Some Basic Models
4. Technologies for Project Development
5. Application
6. Conclusion

Analysing Historical Material Consumption Data

- Analysing historical material consumption data to identify patterns and correlations.

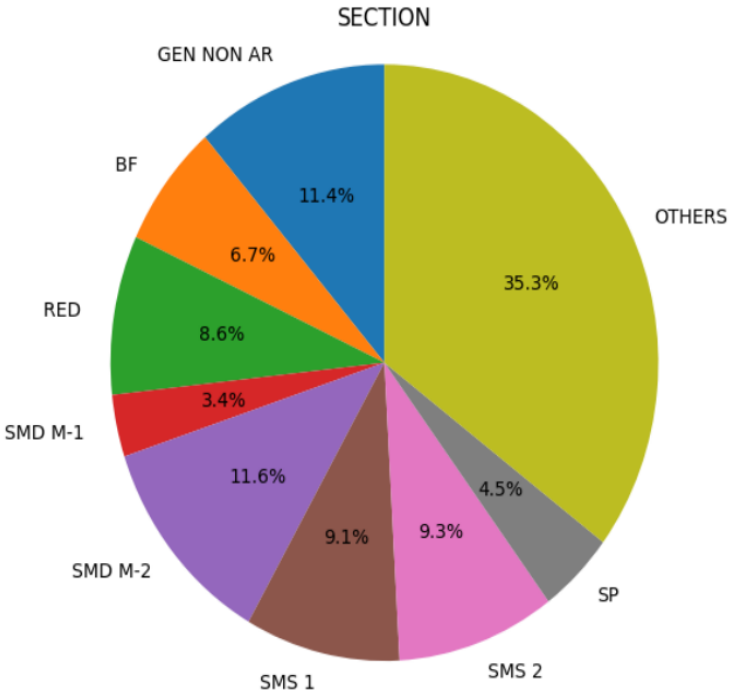


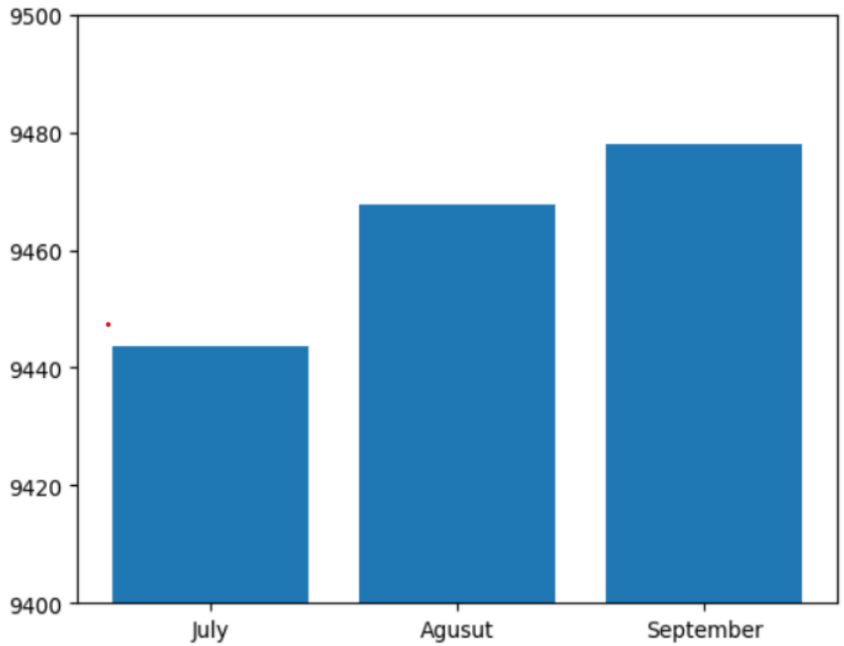
fsn_data_2020_07 - Excel

MRP Cont	MATERIA	OLD MATL No.	Material Type	MRP Controller	Section	FSN inc	SMV in	DESCR.	UC	Op.MAP	Cl.MAP	Op.Stock
921	3801813	0915014620899	ZREF	RED	GEN	F		REFMAGNASIA,MGO-C,SUPP&APPL,2500 HEATS	SET	5,43,61,952.55	6,42,11,975.95	0.000
942	00723	0915060637006	ZREF	SMS1	GEN	F		TUNDISH REFRACTORY MANAGEMENT FOR SMS	EA	1,08,593.38	1,03,145.82	288.000
959	3800751	0915007651801	ZREF	SMS2	GEN	F		TOTAL OPERATIONAL REFRACTORY MANAGEME	EA	12,473.16	12,112.52	0.000
959	2137980	3491375401699	ERSA	SMS2	OPR	S	L	NOZL,AIR MIST FULL CONE,3 LITRES/MIN	EA	0.00	10,917.08	0.000
941	2112231	3390002025599	ERSA	BF	OPR	F		TUYERE,DOUBLE CHAMBER,130,3300021006,R-	EA	2,83,050.79	2,87,208.39	22.000
909	3030796	3190837000199	HIBE	CCP	OPR	S	L	ADSORBANT,SOLID	SET	0.00	1,08,74,660.55	0.000
921	3800147	0915005416006	ZREF	RED	GEN	F		TLC REF. WITH GUARANTEE, SUPP/APPL.BASIS	SET	98,45,113.97	68,42,735.35	1.000
959	2137981	3491375401799	ERSA	SMS2	OPR	S	L	NOZL,AIR MIST FULL CONE,2 LITRES/MIN	EA	0.00	10,917.08	0.000
942	3800742	0915061608900	ZREF	SMS1	GEN	F		NEW GENERATION SLIDE GATE REFRACTORIES	EA	5,090.79	5,065.56	10,252.000
941	3800669	0915480001105	ZREF	BF	GEN	F		SILICON CARBIDE GRAINS	TO	69,638.53	70,077.34	149.520
938	2003662	1915105000107	ERSA	GENL-NON AR	GEN	F		ROLL,AFS,40-45°,1-4012881,RE,610x1244mm	EA	12,98,201.83	13,36,825.81	3.000
938	3002605	0400811714302	HIBE	GENL-NON AR	GEN	F		SODA ASH,SOLID PWD	TO	24,620.88	24,618.27	209.588
942	3010844	3490133600115	HIBE	SMS1	OPR	S	A	SH/PL,Cu,1010x355mm,80mm	KG	773.10	999.95	0.000
940	2104946	3250300071199	ERSA	SP	MEC	F		FORGED GRATE BAR,TYPE 2,PD-SP(3)-221	EA	1,221.91	894.50	70.000
942	2023315	3490121100104	ERSA	SMS1	OPR	F		GRAPHITE ELECTRODE,LADLE FURNACE	TO	2,18,070.63	1,95,000.28	416.855
951	3008961	0602000070104	HIBE	AR-4	GEN	F		OIL,HI SPEED DIESEL OIL	L	62.30	70.63	1,99,404.700
921	3801826	0915007652099	ZREF	RED	GEN	F		REFMAGNASIA,STL SMS-2,MGO-C,70HEATS	SET	26,42,291.96	24,43,273.00	0.000
938	3026718	0403790235699	HIBE	GENL-NON AR	GEN	F		WIRE ROPE,Steel,UNGALV,8X31WS,32mm(LHO)	M	1,271.74	1,306.84	0.000
938	3026719	0403790235799	HIBE	GENL-NON AR	GEN	F		WIRE ROPE,Steel,UNGALV,8X31WS,32mm(RHO)	M	1,271.74	1,306.84	0.000
941	2016538	3390302060110	ERSA	BF	OPR	F		TUYERE,DIA:130,TYPE-II,DRG.3303020617 R1	EA	3,80,359.77	3,75,891.17	22.000
934	3032220	2202051424499	HIBE	L&H	GEN	S	L	OIL,MOBIL GEAR 600XP150,BULK TANKER	KL	0.00	2,05,604.75	0.000
942	3800719	0915060612399	ZREF	SMS1	GEN	F		LADLE WELL MIX,95%SELF OPENING	EA	1,239.78	1,250.53	3,851.000
938	3028705	0401113564499	HIBE	GENL-NON AR	GEN	S	R	CBL,AR,11KV,AL,XLPE,3C,300MM²	M	0.00	1,025.00	0.000
942	2023343	3490133603918	ERSA	SMS1	OPR	F		WALL,COPPER,CONCAVE,320X250,34-0133-603	EA	2,63,489.78	2,66,710.35	23.000
942	2023344	3490133604513	ERSA	SMS1	OPR	F		WALL,COPPER,CONVEX,320X250,34-0133-6045	EA	2,63,471.59	2,66,699.34	23.000
942	3800736	0915060648099	ZREF	SMS1	GEN	F		REFHA,GAS STIRRING LANCE	EA	1,18,995.92	1,22,172.53	88.000
938	2003730	1915140101907	ERSA	GENL-NON AR	GEN	F		ROLL ACS,40-45°,1-51100,RD,680x1000mm	EA	5,17,516.73	5,06,395.09	14.000

Representation of Consumption

- Represeantation of most higly used material for production respective to their sections and in Specific Months.





Developing Predictive models

Developing predictive models to forecast material requirements based on production schedules, market demands, and other relevant factors.

Base Model

```
grouped = df1.groupby('MRP Controller')

group_dataframes = []
for group_name, group_df in grouped:
    group_dataframes.append(group_df)

sum_values = []
for group_df in group_dataframes:
    sum_values.append((group_df['Cl.Value'].sum())/100000)

result_df = pd.DataFrame({'MRP_Controller': grouped.groups.keys(), 'Cl.Value': sum_values})

print(result_df)
```

```
     MRP_Controller     Cl.Value
0         ACS DEPTT   265.609555
1               AR-1   480.076749
2               AR-2   884.919845
3               AR-3   845.738876
4               AR-4   356.778439
5                 BF  5590.611557
6       Blank MRP-C   700.817775
7               CCP   178.922985
8               CED    45.172855
9               CME     0.357905
10               CO  1182.915324
11              CRG  2105.157645
12             CRMP   327.094360
13              DNW   367.773639
14              EMD   302.884311
15              ERS    85.978621
16               ES   423.617793
```

Technologies for Project Development

Python

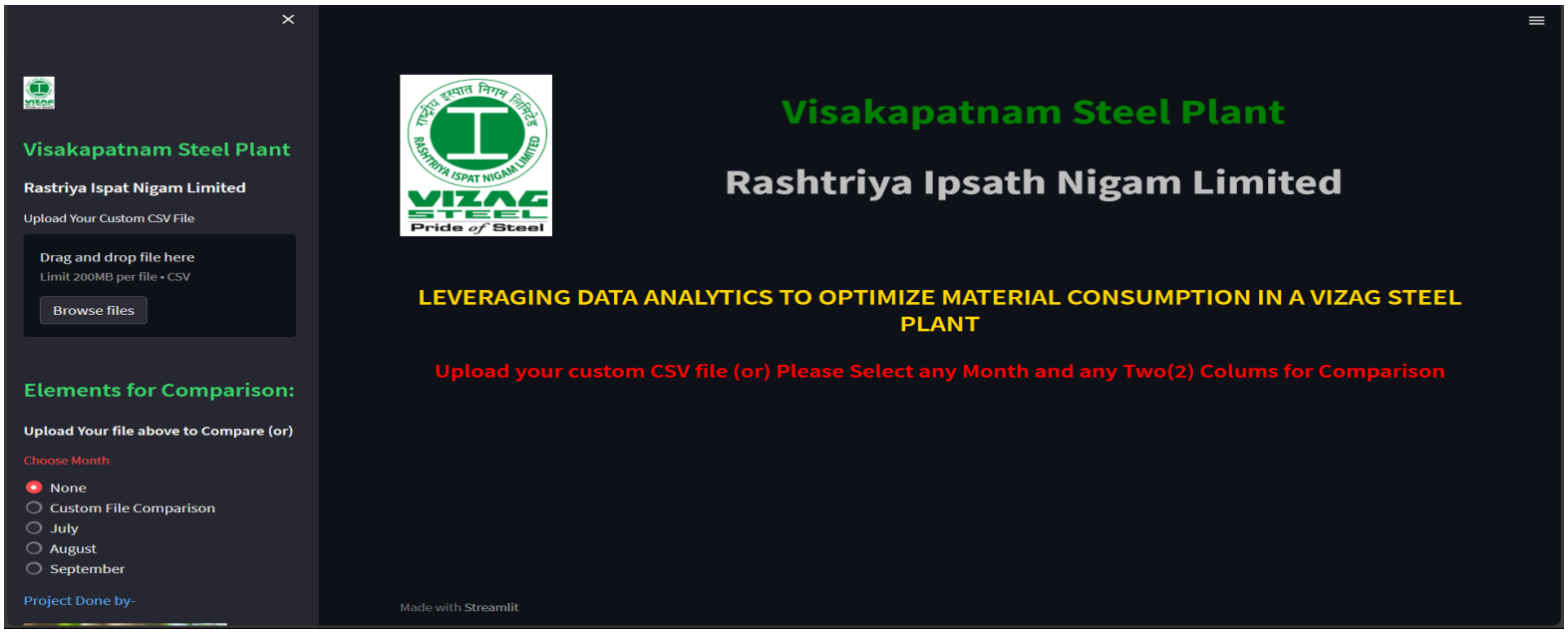
1. Pandas
2. CV2
3. Matplotlib
4. Streamlit
   (for Front end Development)

Streamlit

Application

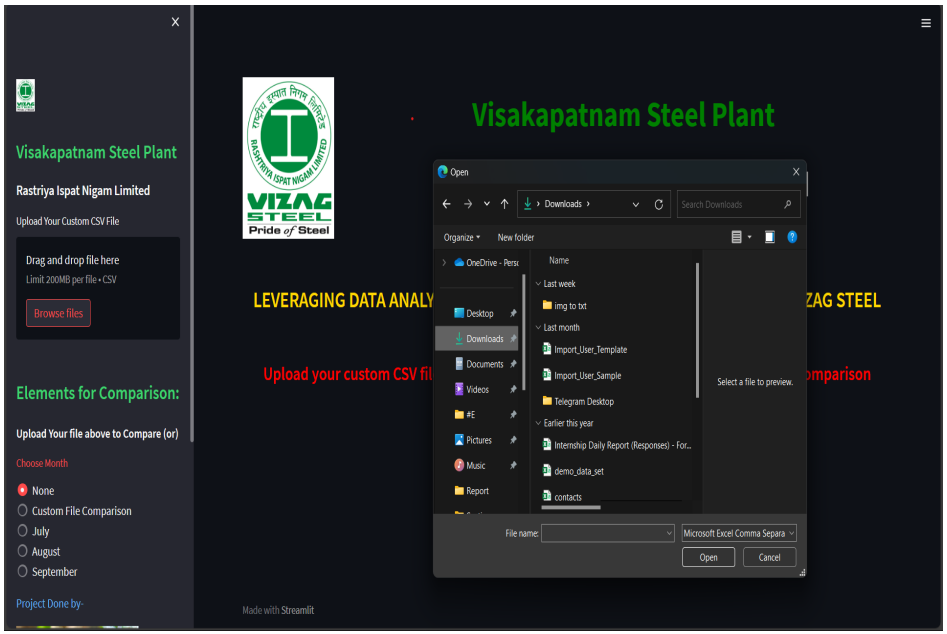
Custom CSV File Plotter

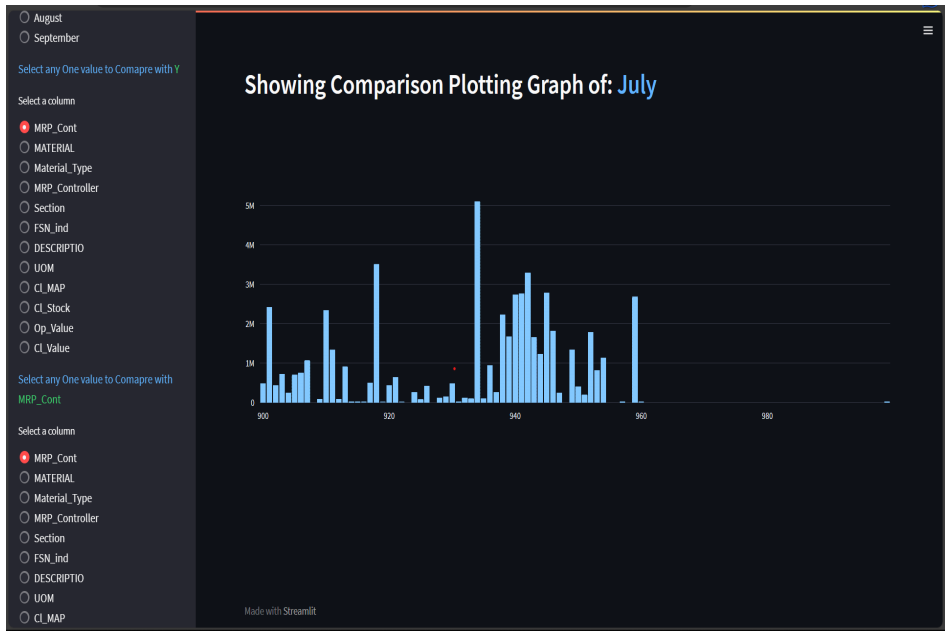
- It is User Friendly and Easily understandable Application
- This real Application provides a GUI for plotting any CSV file to different types of graphs like line,pie,bars,histograms, etc,.
- we can customize our Columns or attribute that which two columns to be compared.



Application snap shots

- For uploading and selecting custom plot we have an option to upload user customized file from left side menu bar
- We have an option to change the comparison Attributes.





Conclusion

In the part of Summer Internship i had Developed the CUSTOM CSV FILE PLOTTING REALTIME APPLICATION.

which provides user friendly GUI for accessing and Using the Application.

Thank You

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