Data Processing

To check the quality of acquired data

Added `Total_Sum` and `Total_Sum_Deviation` columns.

`Total_Sum` adds the up all the constituents of the alloy.
i.e `Total_Sum` = Ti_wt + Nb_wt + Zr_wt + Ta_wt + Sn_wt + Mo_wt + Fe_wt + Mn_wt + Si_wt + Cu_wt + Cr_wt + O_wt + C_wt

`Total_Sum_Deviation` is `Total_Sum` - 100. This columns conveys the suitability of data.

`Total_Sum` closer to 100 translates to high quality data.

Higher the deviation, poorer the data.

Ti_wt	Nb_wt	Zr_wt	Ta_wt	Sn_wt	Mo_wt	Fe_wt	Mn_wt	Si_wt	Cu_wt	Cr_wt	O_wt	C_wt	Total_Sum	Total_Sum
78	0	0	0	0	0	0	0	0	0	0	0	0	78	-22

This will help us in deciding with row to keep and which row to drop.

Added Molybdenum equivalent and Total Alloying Elements

`Mo_eq` (Most important of the new features)

Molybdenum equivalent formula used:

Mo[eq] = %Mo + %Ta/4 + %Nb/3.3 + %W/2 + %V/1.4 + %Cr/0.6 + %Ni/0.8 + %Mn/0.6 + %Fe/0.5 + %Co/0.9

(Formula acquired from Research Gate QnA)

`Total alloying elements` :

This is a simple sum of all the alloying elements.

A model might be able to find a relationship between the total amount of alloying elements and the final elastic modulus, because this value can affect the density and overall microstructure of the alloy.

Spreadsheet Snapshot

Ti_wt	Nb_wt	Zr_wt	Ta_wt	Sn_wt	Mo_wt	Fe_wt	Mn_wt	Si_wt	Cu_wt	Cr_wt	O_wt	C_wt	EM_GPa	Mo_eq	Total_Alloying_Elements	Total_Sum	Total_Sum_Deviation
67	0	0	0	0	33	0	0	0	0	0	0	0	98	33	33	100	0
66.8	0	0	0	0	33	0	0	0	0	0	0	0.2	101	33	33.2	100	0
85	15	0	0	0	0	0	0	0	0	0	0	0	66	4.5455	15	100	0
47	25	0	25	3	0	0	0	0	0	0	0	0	65	13.8258	53	100	0
64.6	23.6	6.7	0	0	5.1	0	0	0	0	0	0	0	63.4	12.2515	35.4	100	0
64.6	23.6	6.7	0	0	5.1	0	0	0	0	0	0	0	78.57	12.2515	35.4	100	0
64.6	23.6	6.7	0	0	5.1	0	0	0	0	0	0	0	69.47	12.2515	35.4	100	0
62.9	17.7	4.8	0	14.6	0	0	0	0	0	0	0	0	52	5.3636	37.1	100	0
65	10.7	9.8	0	14.5	0	0	0	0	0	0	0	0	61	3.2424	35	100	0
65	11.6	11.4	0	12	0	0	0	0	0	0	0	0	42	3.5152	35	100	0
62.5	13.4	11.8	0	12.3	0	0	0	0	0	0	0	0	51	4.0606	37.5	100	0
61	15.5	11.9	0	11.6	0	0	0	0	0	0	0	0	71	4.697	39	100	0
67	6.3	12.1	0	11.7	2.9	0	0	0	0	0	0	0	52	4.8091	33	100	0
66.8	5.8	11.8	0	11.7	3.9	0	0	0	0	0	0	0	66	5.6576	33.2	100	0
65.6	5.7	11.6	0	11.8	5.3	0	0	0	0	0	0	0	69	7.0273	34.4	100	0
54.55	19.65	8.92	10.36	0	6.52	0	0	0	0	0	0	0	87.09	15.0645	45.45	100	0
66	19	1	5	9	0	0	0	0	0	0	0	0	80.58	7.0076	34	100	0
61	13	10	12	4	0	0	0	0	0	0	0	0	69.91	6.9394	39	100	0
56	18	11	9	0	6	0	0	0	0	0	0	0	86.53	13.7045	44	100	0
60	35	3	2	0	0	0	0	0	0	0	0	0	47.63	11.1061	40	100	0
69.19	26.75	0	0	1.9	0	2.16	0	0	0	0	0	0	64	12.4261	30.81	100	0
66.23	27.61	0	0	4.48	0	1.68	0	0	0	0	0	0	58	11.7267	33.77	100	0
65.62	26.41	0	0	5.88	0	2.09	0	0	0	0	0	0	60	12.183	34.38	100	0
63.82	25.72	0	0	8.29	0	2.17	0	0	0	0	0	0	63	12.1339	36.18	100	0
70.7	27.18	0	0	0	0	2.12	0	0	0	0	0	0	83	12.4764	29.3	100	0
60	29	5	6	0	0	0	0	0	0	0	0	0	43	10.2879	40	100	0
58	31	6	0	0	5	0	0	0	0	0	0	0	44	14.3939	42	100	0