

Topic: Neural Network

1.) Build a Neural Network model for 50_startups data to predict profit

	R.D.Spend	Administration	Marketing.Spend	State	Profit
1	165349.20	136897.80	471784.10	New York	192261.83
2	162597.70	151377.59	443898.53	California	191792.06
3	153441.51	101145.55	407934.54	Florida	191050.39
4	144372.41	118671.85	383199.62	New York	182901.99
5	142107.34	91391.77	366168.42	Florida	166187.94
6	131876.90	99814.71	362861.36	New York	156991.12
7	134615.46	147198.87	127716.82	California	156122.51
8	130298.13	145530.06	323876.68	Florida	155752.60
9	120542.52	148718.95	311613.29	New York	152211.77
10	123334.88	108679.17	304981.62	California	149759.96
11	101913.08	110594.11	229160.95	Florida	146121.95
12	100671.96	91790.61	249744.55	California	144259.40
13	93863.75	127320.38	249839.44	Florida	141585.52
14	91992.39	135495.07	252664.93	California	134307.35
15	119943.24	156547.42	256512.92	Florida	132602.65
16	114523.61	122616.84	261776.23	New York	129917.04

2.) Predict the burned area of forest fires with Neural Networks

	month	day	FFMC	DMC	DC	ISI	temp	RH	wind	rain	area	dayfri	daymon	daysat	daysun	d
1	mar	fri	86.2	26.2	94.3	5.1	8.2	51	6.7	0.0	0.00	1	0	0	0	0
2	oct	tue	90.6	35.4	669.1	6.7	18.0	33	0.9	0.0	0.00	0	0	0	0	0
3	oct	sat	90.6	43.7	686.9	6.7	14.6	33	1.3	0.0	0.00	0	0	1	0	0
4	mar	fri	91.7	33.3	77.5	9.0	8.3	97	4.0	0.2	0.00	1	0	0	0	0
5	mar	sun	89.3	51.3	102.2	9.6	11.4	99	1.8	0.0	0.00	0	0	0	1	0
6	aug	sun	92.3	85.3	488.0	14.7	22.2	29	5.4	0.0	0.00	0	0	0	1	0
7	aug	mon	92.3	88.9	495.6	8.5	24.1	27	3.1	0.0	0.00	0	1	0	0	0
8	aug	mon	91.5	145.4	608.2	10.7	8.0	86	2.2	0.0	0.00	0	1	0	0	0
9	sep	tue	91.0	129.5	692.6	7.0	13.1	63	5.4	0.0	0.00	0	0	0	0	0
10	sep	sat	92.5	88.0	698.6	7.1	22.8	40	4.0	0.0	0.00	0	0	1	0	0
11	sep	sat	92.5	88.0	698.6	7.1	17.8	51	7.2	0.0	0.00	0	0	1	0	0
12	sep	sat	92.8	73.2	713.0	22.6	19.3	38	4.0	0.0	0.00	0	0	1	0	0
13	aug	fri	63.5	70.8	665.3	0.8	17.0	72	6.7	0.0	0.00	1	0	0	0	0
14	sep	mon	90.9	126.5	686.5	7.0	21.3	42	2.2	0.0	0.00	0	1	0	0	0
15	sep	wed	92.9	133.3	699.6	9.2	26.4	21	4.5	0.0	0.00	0	0	0	0	0
16	sep	fri	93.3	141.2	713.9	13.9	22.9	44	5.4	0.0	0.00	1	0	0	0	0

3.) Prepare a model for strength of concrete data using Neural Networks

	cement	slag	ash	water	superplastic	coarseagg	fineagg	age	strength
1	141.3	212.0	0.0	203.5	0.0	971.8	748.5	28	29.89
2	168.9	42.2	124.3	158.3	10.8	1080.8	796.2	14	23.51
3	250.0	0.0	95.7	187.4	5.5	956.9	861.2	28	29.22
4	266.0	114.0	0.0	228.0	0.0	932.0	670.0	28	45.85
5	154.8	183.4	0.0	193.3	9.1	1047.4	696.7	28	18.29
6	255.0	0.0	0.0	192.0	0.0	889.8	945.0	90	21.86
7	166.8	250.2	0.0	203.5	0.0	975.6	692.6	7	15.75
8	251.4	0.0	118.3	188.5	6.4	1028.4	757.7	56	36.64
9	296.0	0.0	0.0	192.0	0.0	1085.0	765.0	28	21.65
10	155.0	184.0	143.0	194.0	9.0	880.0	699.0	28	28.99
11	151.8	178.1	138.7	167.5	18.3	944.0	694.6	28	36.35
12	173.0	116.0	0.0	192.0	0.0	946.8	856.8	3	6.94
13	385.0	0.0	0.0	186.0	0.0	966.0	763.0	14	27.92
14	237.5	237.5	0.0	228.0	0.0	932.0	594.0	7	26.26
15	167.0	187.0	195.0	185.0	7.0	898.0	636.0	28	23.89
16	213.8	98.1	24.5	181.7	6.7	1066.0	785.5	100	49.97
17	237.5	237.5	0.0	228.0	0.0	932.0	594.0	28	30.08

Hints:

1. Business Problem
 - 1.1. Objective
 - 1.2. Constraints (if any)
2. Data Pre-processing
 - 2.1 Data cleaning, Feature Engineering, EDA etc.
3. Model Building
 - 3.1 Partition the dataset
 - 3.2 Model(s) - Reasons to choose any algorithm
 - 3.3 Model(s) Improvement steps
 - 3.4 Model Evaluation
 - 3.5 Python and R codes
4. Deployment
 - 4.1 Deploy solutions using R shiny and Python Flask.
5. Result Share the benefits/impact of the solution - how or in what way the business (client) gets benefit from the solution provided.

Note:

1. For each assignment the solution should be submitted in the format
2. Research and Perform all possible steps for improving the model(s) accuracy
Ex: Feature Engineering, Hyper Parameter tuning etc.
3. All the codes (executable programs) are running without errors
4. Documentation of the module should be submitted along with R & Python codes, elaborating on every step mentioned here