To find the following Machine Learning Regression using r2 value

Sample dataset: "50_Startups.csv"

1. **Multiple Linear Regression: {r2 value = 0.8766}**

2. **SVM – Support Vector Machine Regression:**

S.NO	HYPER PARAMETER	LINEAR (r value)	RBF (NON-LINEAR) (r value)	POLY (r value)	SIGMOID (r value)
1	C=10	-0.0396	-0.0568	-0.05366	-0.0547
2	C=100	0.10646	-0.05072	-0.01980	-0.0304
3	C=500	0.59289	-0.02432	0.1146	0.0705
4	C=1000	0.78028	0.00676	0.2661	0.1850
5	C=2000	0.87677	0.06751	0.48100	0.3970
6	C=3000	0.89567	0.12322	0.63700	0.5913

SVM Regression - *R^2 value* ("linear" & hyper parameter C=3000) = 0.89567

3. **Decision Tree Regressor:**

Criterion List = *{"squared_error", "friedman_mse", "absolute_error", "poisson"}*
Mse = Mean squared error
Mae = Mean absolute error

S.NO	CRITERION LIST	MAX FEATURES	SPLITTER	R VALUE
1	squared_error	None	*best*	0.9205
2	squared_error	None	*random*	0.74905
3	squared_error	*sqrt*	*best*	0.19420
4	squared_error	*sqrt*	*random*	0.7042
5	squared_error	*log2*	*best*	0.31072
6	squared_error	*log2*	*random*	0.5671
7	Mae	None	*best*	0.96987
8	Mae	None	*random*	0.5584
9	Mae	*sqrt*	*best*	0.4185
10	Mae	*sqrt*	*random*	-0.3008
11	Mae	*log2*	*best*	0.34099

12	Mae	*log2*	*random*	-0.8970
13	friedman_mse	None	*best*	0.9093
14	friedman_mse	None	*random*	0.8607
15	friedman_mse	*sqrt*	*best*	0.15668
16	friedman_mse	*sqrt*	*random*	0.8029
17	friedman_mse	*log2*	*best*	-1.0025
18	friedman_mse	*log2*	*random*	0.42074
19	poisson	None	*best*	0.9289
20	poisson	None	*random*	0.91345
21	poisson	*sqrt*	*best*	0.39281
22	poisson	*sqrt*	*random*	0.39206
23	poisson	*log2*	*best*	0.8921
24	poisson	*log2*	*random*	0.4512

Decision Tree Regressor - *R^2 value* (Criterion list = "poisson", Max feature = "None", Splitter=best) = 0.9289

4. **Random Forest:**

Criterion List = *{"squared_error", "friedman_mse", "absolute_error", "poisson"}*

S.NO	N_ESTIMATORS	CRITERION LIST	MAX FEATURES	R VALUE
1	*50*	squared_error	None	0.94463
2	*50*	squared_error	*sqrt*	0.6830
3	*50*	squared_error	*log2*	0.6830
4	*50*	Mae	None	0.9401
5	*50*	Mae	*sqrt*	0.7222
6	*50*	Mae	*log2*	0.7222
7	*50*	friedman_mse	None	0.9388
8	*50*	friedman_mse	*sqrt*	0.6889
9	*50*	friedman_mse	*log2*	0.6889
10	*50*	poisson	None	0.94635
11	*50*	poisson	*sqrt*	0.72086
12	*50*	poisson	*log2*	0.72086

Random Forest Regressor - *R^2 value* (Criterion list = "poisson", Max feature = "None") = 0.94635