To find the following the machine learning regression method using r^2 valueD:

1. Multiple Linear Regression: (R^2 Value) = 0.935856

2. **Support Vector Machine:**

Sl.no	Hyper Parameter	Linear (R^2 value)	RBF (Non linear - R^2 value)	Poly (R^2 value)	Sigmoid (R^2 value)
1	C=0.1	-0.0573	-0.0574	-0.0574	-0.0574
2	C=1.0	-0.0556	-0.0574	-0.0571	-0.0572
3	C=10	-0.0396	-0.0568	-0.0536	-0.0547
4	C=100	0.1064	-0.0507	-0.0198	-0.0304
5	C=500	0.5928	-0.0243	0.1146	0.0705
6	C=1000	0.7802	0.0067	0.2661	0.1850
7	C=2000	0.8767	0.0675	0.4810	0.3970
8	C=3000	0.8956	0.1232	0.6370	0.5913
9	C=5000	0.9003	0.2124	0.7936	0.7306
10	C=10000	0.9239	0.3718	0.8129	0.8535

The SVM Regression parameters used best R^2 value (Linear and hyper parameter(c10000))=0.9239

3. Decision Tree:

Sl.no	criterion	splitter	max_features	R^2 value
1	squared_error	best	none	0.91112
2	squared_error	best	sqrt	0.55378
3	squared_error	best	log2	0.45621

4	squared_error	random	none	0.95330
5	squared_error	random	sqrt	0.26525
6	squared_error	random	log2	0.86073
7	friedman_mse	best	none	0.90147
8	friedman_mse	best	sqrt	0.72436
9	friedman_mse	best	log2	0.74958
10	friedman_mse	random	none	0.81100
11	friedman_mse	random	sqrt	0.65062
12	friedman_mse	random	log2	0.86999
13	absolute_error	best	none	0.96435
14	absolute_error	best	sqrt	0.20147
15	absolute_error	best	log2	0.72403
16	absolute_error	random	none	0.85333
17	absolute_error	random	sqrt	0.56771
18	absolute_error	random	log2	0.68825
19	poisson	best	none	0.92309
20	poisson	best	sqrt	0.05179
21	poisson	best	log2	0.54294
22	poisson	random	none	0.90524
23	poisson	random	sqrt	0.67094
24	poisson	random	log2	-0.65301

The Decision Tree Regression parameters used the best R^2 value, (Criterion, Splitter, max_features)

1. **Absolute_error, Best, None = 0.96435**
2. **Squared_error, Random, None = 0.95330**

3. Random Forest:

Sl.no	criterion	max_features	R^2 value
1	squared_error	none	0.94463
2	squared_error	sqrt	0.68300
3	squared_error	log2	0.68300
4	friedman_mse	none	0.93889
5	friedman_mse	sqrt	0.68891
6	friedman_mse	log2	0.68891
7	absolute_error	none	0.94019
8	absolute_error	sqrt	0.72223
9	absolute_error	log2	0.72223
10	poisson	none	0.94635
11	poisson	sqrt	0.72086
12	poisson	log2	0.72086

The Random Forest Regression parameters used the best R^2 value, (Criterion, max_features)

1. poisson, None = 0.94635
2. Squared_error, None = 0.94463
3. Absolute_error, None = 0.94019

Over All R2 values:

Sl.no	Multilinear	SVM	Decision Tree	Random Forest
Hyper tuning parameters	-	Linear and hyper parameter C=10000	Absolute_error, Best, None	poisson, None

R2 Value	**0.93585**	**0.9239**	**0.96435**	**0.94635**

The Decision tree gives the best model for the “50_Startups.csv” dataset. The accuracy is 0.96435.