1.Identify your problem statement:

Based on the given statement, we need to predict the Insurance charges.

2.)Tell basic info about the dataset (Total number of rows, columns)

Given dataset is mentioned the ages,bmi,children,sex,somking status.

Total Number of Rows :1338

Total Number of Columns :6

3.) Mention the pre-processing method if you're doing any (like converting string to number – nominal data)

pre-processing method :Nominal Data

4.) Develop a good model with r2_score. You can use any machine learning algorithm; you can create many models. Finally, you must come up with final model.

Final Model :Random_Forest(***n_estimators***=*100*, ***criterion***=*' poisson '*,

5.All the research values (r2_score of the models) should be documented. (You can make tabulation or screenshot of the results.)

i) Multiple_Liner_Model

Multiple Linear r2_score	0.789479035

ii)SVMR_Model

SVMR		
Kernel	**C**	**R2**
Linear	0.01	0.038716223
Linear	0.1	0.038716223
Linear	1	-0.010102665
Linear	10	0.462468414
Linear	100	**0.628879286**
Rbf	100	0.320031783
Rbf	10	-0.032273294
Rbf	0.1	-0.089074515
Rbf	0.01	-0.089645537
Poly	0.01	-0.089568285
Poly	0.1	-0.088302377
Poly	10	0.038716223
Poly	100	0.617956962
Sigmoid	100	0.527610355
Sigmoid	10	0.039307144
Sigmoid	0.1	-0.088269915
Sigmoid	0.01	-0.089565016

R^2 Value =0.628879286

iii)Decision_Tree_Model

Decision Tree		
Criterion	**splitter**	**R2**
squared_error	best	0.694775596
squared_error	random	0.696096406
friedman_mse	best	0.688181321
friedman_mse	random	0.693510661
absolute_error	best	0.655280103
absolute_error	random	0.631079204
Poisson	best	**0.718231189**
Poisson	random	0.685400154

R^2 Value =0.718231189

iv)Random_Forest_Model

Random Forest		
n_estimators	**criterion**	**R2**
10	squared_error	0.854571403
50	squared_error	0.854571403
100	squared_error	0.856178502
10	friedman_mse	0.84401946
50	friedman_mse	0.854827452
100	friedman_mse	0.856577205
10	absolute_error	0.839536985
50	absolute_error	0.855411224
100	absolute_error	0.849985594
10	poisson	0.84875122
50	poisson	0.857534008
100	poisson	**0.858311806**

R^2 Value =0.858311806

6.)Mention your final model, justify why u have chosen the same.

Final Model : *Random_Forest_Model*

After evaluating different algorithms, it was determined that the random forest algorithm consistently delivered the most optimal results. As a result, it has been selected as the final model for this project.