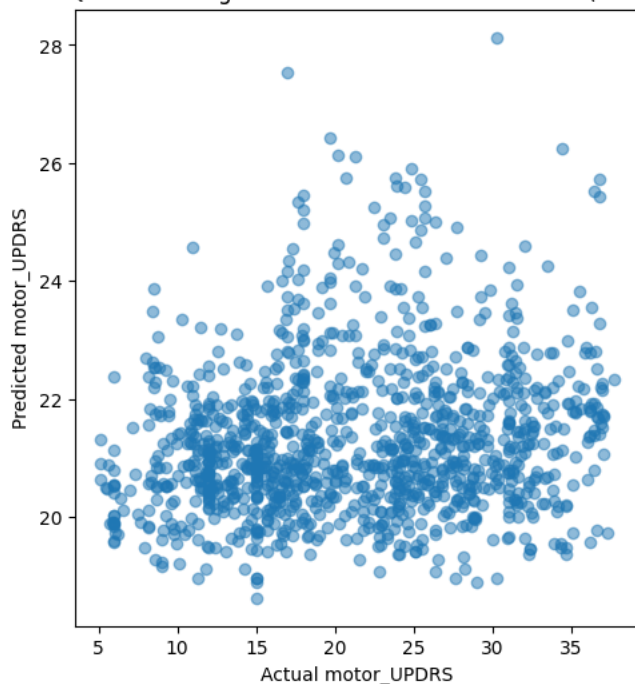


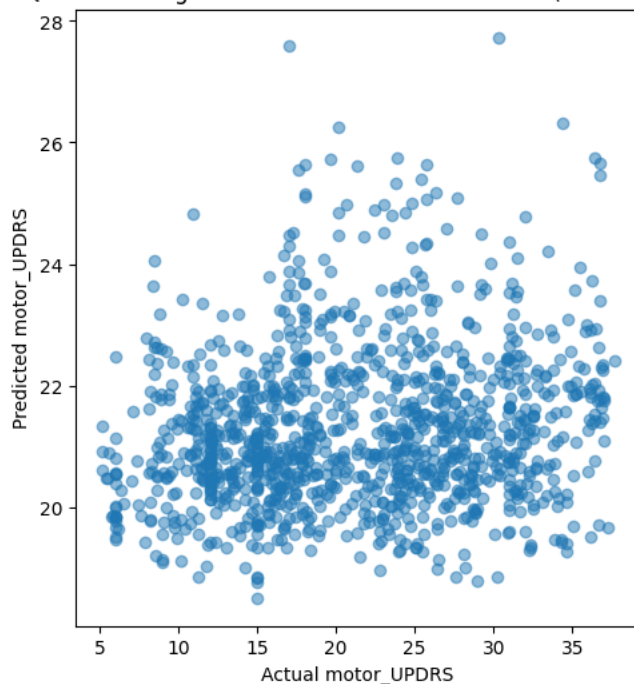
1. Linear Regression with One Variable PPE: MSE = 62.18924122454346, R-squared = 0.02569331885074344

2. Linear Regression with Two Variables PPE and NHR: MSE = 62.147796490901534, R-squared = 0.026342625388187546

Q1. Linear Regression Model with One Variable(PPE)



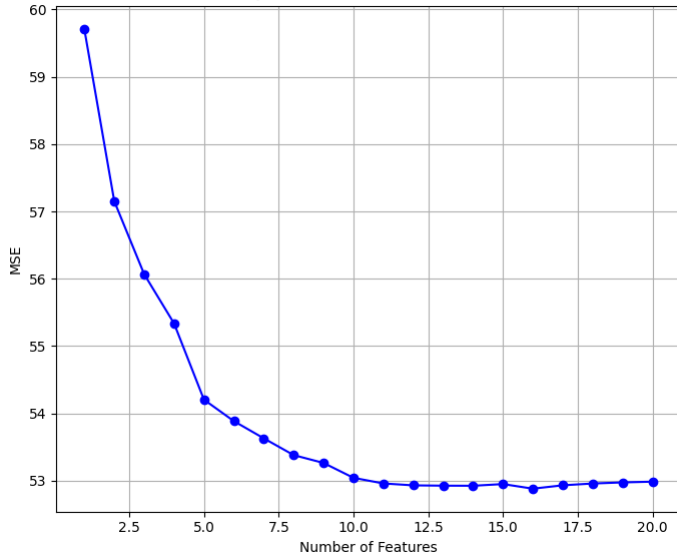
Q2. Linear Regression Model with Two Variables(PPE & NHR)



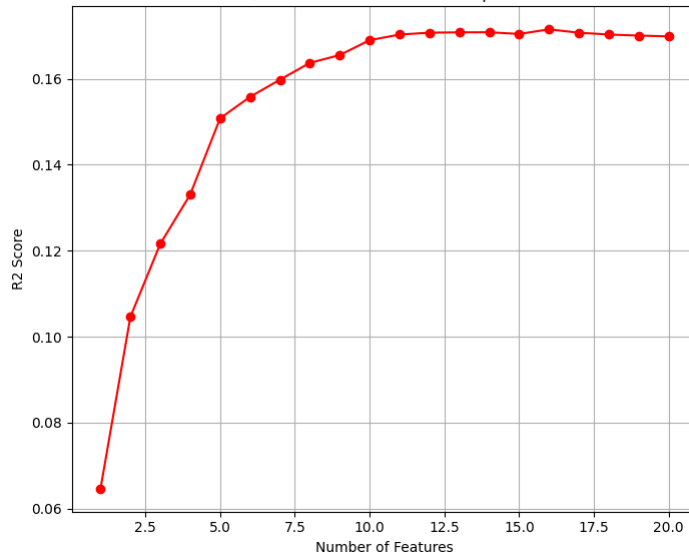
3a Proceeding for Forward stepwise linear regression

Added age. New MSE: 59.70306663654948, New R2: 0.0646437299490229
 Added subject#. New MSE: 57.15138753404598, New R2: 0.1046203874667051
 Added sex. New MSE: 56.06809101801905, New R2: 0.12159218214449918
 Added DFA. New MSE: 55.336468812233775, New R2: 0.1330543641737023
 Added PPE. New MSE: 54.20474850133896, New R2: 0.1507848049764109
 Added Jitter(Abs). New MSE: 53.88629300916038, New R2: 0.15577398489835226
 Added test_time. New MSE: 53.63085203370302, New R2: 0.15977592870932078
 Added Jitter:DDP. New MSE: 53.381636446855964, New R2: 0.16368034057430747
 Added NHR. New MSE: 53.265122029829904, New R2: 0.16550574916144256
 Added HNR. New MSE: 53.044471322016584, New R2: 0.16896264065247402
 Added Jitter:RAP. New MSE: 52.96096311240507, New R2: 0.17027094744241456
 Added Jitter(%). New MSE: 52.932519928405576, New R2: 0.17071656124406553
 Added RPDE. New MSE: 52.927857106339324, New R2: 0.17078961276556193
 Added Jitter:PPQ5. New MSE: 52.926449463257114, New R2: 0.17081166603446607
 Added Shimmer:APQ11. New MSE: 52.951688190153035, New R2: 0.1704162558356247
 Added Shimmer:APQ5. New MSE: 52.88329044178852, New R2: 0.17148782998406142
 Added Shimmer(dB). New MSE: 52.93333472015681, New R2: 0.1707037960610317
 Added Shimmer:DDA. New MSE: 52.95994422160401, New R2: 0.17028691020535036
 Added Shimmer:APQ3. New MSE: 52.976147440167345, New R2: 0.1700330575486605
 Added Shimmer. New MSE: 52.98729409468748, New R2: 0.16985842509202365

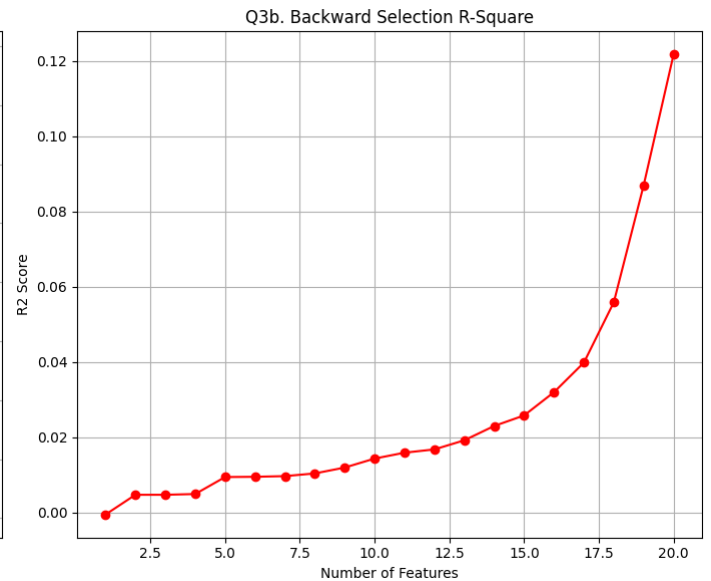
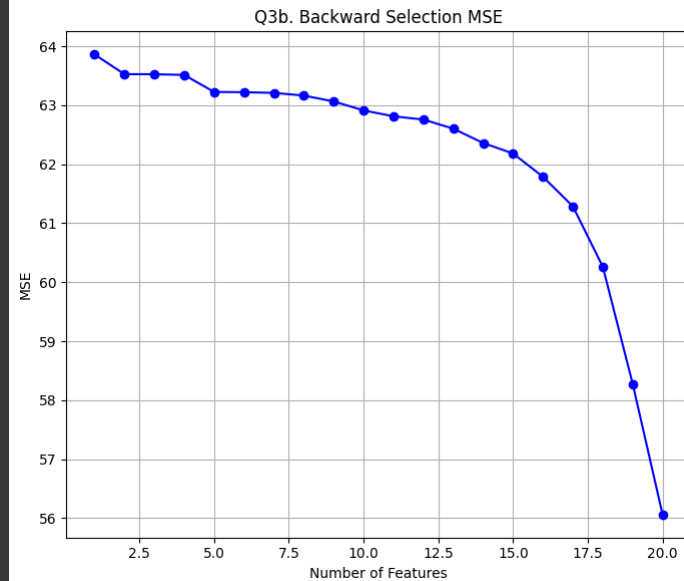
Q3-a. Forward Selection MSE



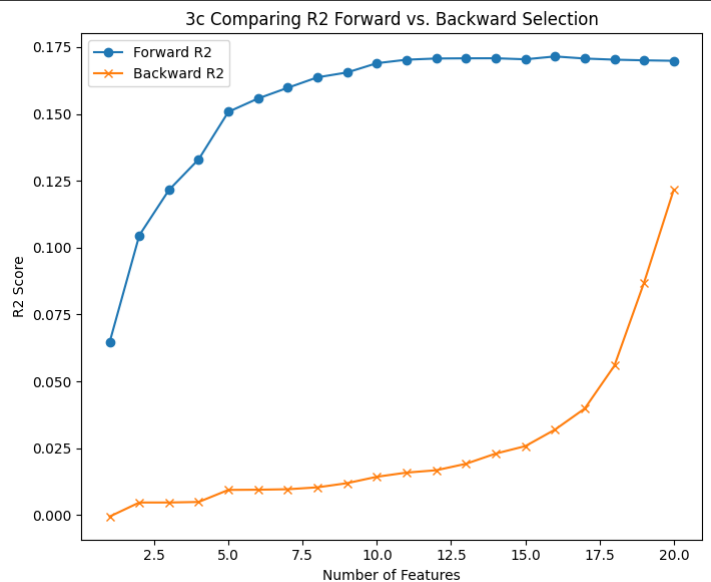
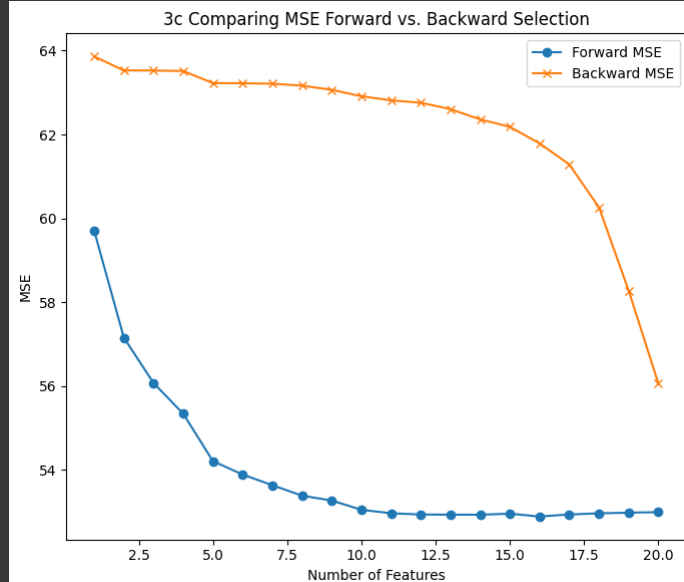
Q3-a. Forward Selection R-Square



```
3b Proceeding with Backward stepwise linear regression
Removed subject#. MSE: 56.060740744496876, R2: 0.12170733744242379
Removed age. MSE: 58.27691495396454, R2: 0.08698696947590068
Removed DFA. MSE: 60.26289714133695, R2: 0.05587297490545873
Removed Jitter(Abs). MSE: 61.28600130632325, R2: 0.03984420202079475
Removed Shimmer:APQ11. MSE: 61.78754798939506, R2: 0.03198656821463963
Removed test_time. MSE: 62.18199813878457, R2: 0.02580679485894144
Removed PPE. MSE: 62.36048117183072, R2: 0.023010536082591848
Removed Shimmer(dB). MSE: 62.603472456406585, R2: 0.019203639144124707
Removed Shimmer. MSE: 62.7576882209984, R2: 0.01678757089992522
Removed RPDE. MSE: 62.81343973669434, R2: 0.01591412282299043
Removed HNR. MSE: 62.91314033382892, R2: 0.014352133064150063
Removed sex. MSE: 63.06539035198851, R2: 0.011966861802158224
Removed Jitter(%). MSE: 63.16499882495011, R2: 0.010406315334720917
Removed Shimmer:APQ5. MSE: 63.21057873714713, R2: 0.009692223763489105
Removed Jitter:PPQ5. MSE: 63.221954103375644, R2: 0.009514008125241613
Removed Shimmer:APQ3. MSE: 63.22632242988865, R2: 0.009445570407989323
Removed Shimmer:DDA. MSE: 63.51416787500362, R2: 0.004935952107593895
Removed NHR. MSE: 63.52686222867263, R2: 0.0047370721510444636
Removed Jitter:DDP. MSE: 63.52698466703442, R2: 0.004735153933173031
Removed Jitter:RAP. MSE: 63.86202040564551, R2: -0.0005137854673569198
```

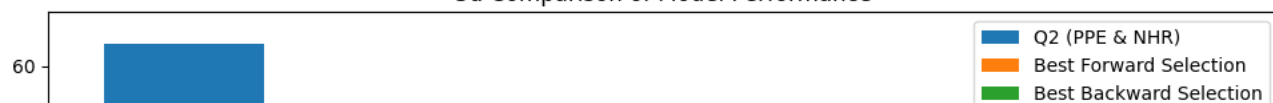


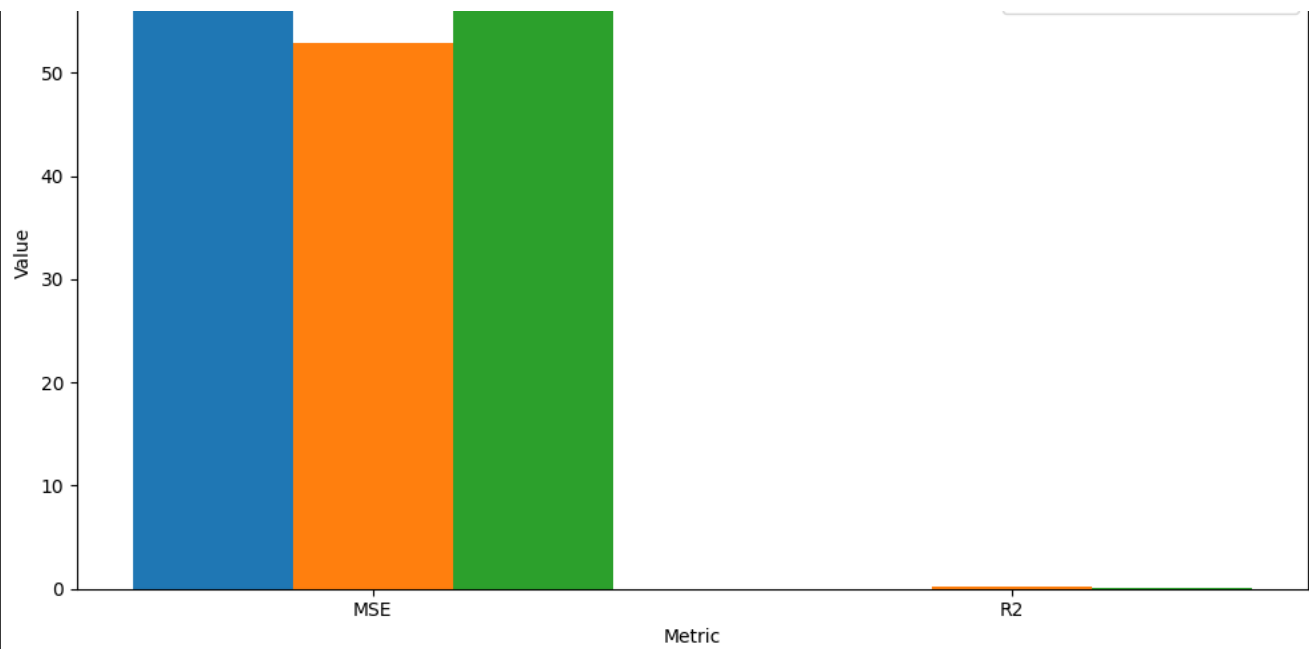
```
3c comparing Forward & Backward
Forward Selection Final MSE: 63.86202040564551
Backward Elimination Final MSE: 63.86202040564551
Forward Selection Final R2: 0.16985842509202365
Backward Elimination Final R2: -0.0005137854673569198
```



3d Comparing Q2 with best of Q3

3d Comparison of Model Performance





Q4 Best Model with Scaling and L2 Regularization: MSE = 63.86202040564551, R-squared = -0.0005137854673569198

