***The Results***

**The Ridge Regression:**

1. Ridge, Tarin-test, Normalize (Tuning alpha)

Alpha Best alpha value found: 0.0029836472402833404

Coefficients of alpha:

fra\_kote -0.031802

til\_kote 0.041262

Laengde 0.009434

Fald -0.001925

DiameterIn -0.001917

MaterialeK 0.029729

anlag\_aar -0.733248

TransportK 0.000000

Funktionsk 0.083590

TVObsKode -9.780700

DatoSaneri -0.020509

PipeStatus 13.332544

The MSE: The MSE associated with alpha value: 90.81109946812451

The : on train data is 0.8311104945001093

on test data is 0.8309885299916433

1. Ridge, validation set, Normalize (Tuning alpha)

Alpha: Best alpha found: 1e-10

Coefficients of alpha:

fra\_kote 0.007794

til\_kote 0.000412

Laengde 0.005767

Fald -0.005658

DiameterIn -0.002578

MaterialeK 0.066843

anlag\_aar -0.733219

TransportK 0.000000

Funktionsk 0.149071

TVObsKode -9.490808

DatoSaneri -0.020660

PipeStatus 13.084698

The MSE: The MSE associated with alpha value: 90.07184896703374

The : on train data is 0.8317274925326696

on test data is 0.8323643729736745

1. Ridge, cross validation, Normalize (Tuning alpha)

Alpha: Best alpha found: 0.001873817422860383

Coefficients of alpha:

fra\_kote 0.006675

til\_kote 0.001198

Laengde 0.005575

Fald -0.005694

DiameterIn -0.002555

MaterialeK 0.064600

anlag\_aar -0.730847

TransportK 0.000000

Funktionsk 0.147610

TVObsKode -8.734977

DatoSaneri -0.020612

PipeStatus 12.361030

The MSE: The MSE associated with alpha value: 90.01881888041491

The : on train data is 0.8317126429455503

on test data is 0.832463068980513

1. Ridge, Tarin-test, Standardization (Tuning alpha)

Alpha: Best alpha value found: 8.111308307896856

Coefficients of alpha:

fra\_kote -0.525289

til\_kote 0.670481

Laengde 0.274561

Fald -0.122947

DiameterIn -0.399411

MaterialeK 0.164067

anlag\_aar -14.947931

TransportK 0.000000

Funktionsk 0.126777

TVObsKode -4.163546

DatoSaneri -18.777027

PipeStatus 5.551277

The MSE: The MSE associated with alpha value: 90.82620493926125

The : on train data is 0.831119159808779

on test data is 0.8309604167114721

1. Ridge, validation set, Standardization (Tuning alpha)

Alpha: Best alpha found: 1e-10

Coefficients of alpha:

fra\_kote 0.118811

til\_kote 0.006262

Laengde 0.160950

Fald -0.299858

DiameterIn -0.529410

MaterialeK 0.349170

anlag\_aar -14.907892

TransportK 0.000000

Funktionsk 0.226772

TVObsKode -4.003697

DatoSaneri -18.888154

PipeStatus 5.443152

The MSE: The MSE associated with alpha value: 90.0718489708226

The : on train data is 0.8317274925326696

on test data is 0.832364372966623

1. Ridge, cross validation, Standardization (Tuning alpha)

Alpha: Best alpha found: 5.0941380148163855

Coefficients of alpha:

fra\_kote -0.649360

til\_kote 0.795608

Laengde 0.271483

Fald -0.089904

DiameterIn -0.398850

MaterialeK 0.162579

anlag\_aar -14.944761

TransportK 0.000000

Funktionsk 0.128824

TVObsKode -4.307857

DatoSaneri -18.782510

PipeStatus 5.715191

The MSE: The MSE associated with alpha value: 90.87556801649636

The : on train/validation data is 0.8311367549141078

on test data is 0.8308685454942255

**The Lasso Regression:**

1. Lasso, Tarin-test, Normalize (Tuning alpha)

Alpha: Best alpha value found: 0.00027171941816504954

Coefficients of alpha:

fra\_kote 0.000000

til\_kote 0.004909

Laengde 0.008660

Fald -0.005480

DiameterIn -0.001933

MaterialeK 0.057187

anlag\_aar -0.739042

TransportK 0.000000

Funktionsk 0.022412

TVObsKode -9.599596

DatoSaneri -0.020684

PipeStatus 12.913336

The MSE: The MSE associated with alpha value: 90.00606557219152

The : on train data is 0.8330479082635659

on test data is 0.8330339382074528

1. Lasso, validation set, Normalize (Tuning alpha)

Alpha: Best alpha found: 1e-10

Coefficients of alpha:

fra\_kote -0.032808

til\_kote 0.039080

Laengde 0.010028

Fald -0.004809

DiameterIn -0.002068

MaterialeK 0.060376

anlag\_aar -0.740557

TransportK 0.000000

Funktionsk 0.038120

TVObsKode -10.763722

DatoSaneri -0.020689

PipeStatus 14.077606

The MSE: The MSE associated with alpha value: 89.32316048512754

The : on train data is 0.8334858109709405

on test data is 0.8343007636401645

1. Lasso, cross validation, Normalize (Tuning alpha)

Alpha: Best alpha found: 0.0001830738280295366

Coefficients of alpha:

fra\_kote 0.000000

til\_kote 0.007438

Laengde 0.010585

Fald -0.005505

DiameterIn -0.002681

MaterialeK 0.088369

anlag\_aar -0.737195

TransportK 0.000000

Funktionsk -0.019330

TVObsKode -8.563289

DatoSaneri -0.020750

PipeStatus 12.021491

The MSE: The MSE associated with alpha value: 89.26292377587706

The : on train data is 0.8334675351480569

on test data is 0.8344125059550291

1. Lasso, Tarin-test, Standardization (Tuning alpha)

Alpha: Best alpha value found: 0.00027171941816504954

Coefficients of alpha:

fra\_kote 0.000000

til\_kote 0.004909

Laengde 0.008660

Fald -0.005480

DiameterIn -0.001933

MaterialeK 0.057187

anlag\_aar -0.739042

TransportK 0.000000

Funktionsk 0.022412

TVObsKode -9.599596

DatoSaneri -0.020684

PipeStatus 12.913336

The MSE: The MSE associated with alpha value: 90.11525659991264

The : on train data is -3992.421579915157

on test data is -4027.534565341788

1. Ridge, validation set, Standardization (Tuning alpha)

Alpha: Best alpha found: 1e-10

Coefficients of alpha:

fra\_kote -0.494166

til\_kote 0.614310

Laengde 0.326611

Fald -0.304150

DiameterIn -0.545949

MaterialeK 0.488447

anlag\_aar -15.121566

TransportK 0.000000

Funktionsk -0.035154

TVObsKode -3.972688

DatoSaneri -18.974197

PipeStatus 5.356566

The MSE: The MSE associated with alpha value: 89.3231604851273

The : on train data is 0.8334858109709408

on test data is 0.8343007636401649

1. Ridge, cross validation, Standardization (Tuning alpha)

Alpha: Best alpha found: 0.007564633275546291

Coefficients of alpha:

fra\_kote 0.000000

til\_kote 0.084861

Laengde 0.252207

Fald -0.365854

DiameterIn -0.396374

MaterialeK 0.317354

anlag\_aar -15.155918

TransportK 0.000000

Funktionsk 0.048928

TVObsKode -4.294270

DatoSaneri -18.913032

PipeStatus 5.613163

The MSE: The MSE associated with alpha value: 90.06496944050436

The : on train/validation data is 0.8330716593307329

on test data is 0.8329246683837579