# Lecture 5 - Experimental Design, Performance Measures for Regression Tasks, Cross-validation Schemes & The Curse of Dimensionality

---

In [1]:
```python
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
plt.style.use('bmh')
```

In [2]:
```python
def NoisySinusoidalData(N, a, b, sigma):
    '''Generates N data points in the range [a,b) sampled from a sin(2*pi*x)
    with additive zero-mean Gaussian random noise with standard deviation si

    # N input samples, evenly spaced numbers between [a,b) incrementing by 1
    x = np.linspace(a,b,N)

    # draw N sampled from a univariate Gaussian distribution with mean 0, si
    noise = np.random.normal(0,sigma,N)

    # desired values, noisy sinusoidal
    t = np.sin(2*np.pi*x) + noise

    return x, t
```

In [3]:
```python
# Generate input samples and desired values
N_train = 70 # number of data samples for training
N_test = 20 # number of data samples for test

a, b = [0,1] # data samples interval

sigma_train = 0.4 # standard deviation of the zero-mean Gaussian noise -- tr
sigma_test = 0.5 # standard deviation of the zero-mean Gaussian noise -- tes

x_train, t_train = NoisySinusoidalData(N_train, a, b, sigma_train) # Trainir
x_true, t_true = NoisySinusoidalData(N_train, a, b, 0) # True Sinusoidal - i
x_test, t_test = NoisySinusoidalData(N_test, a, b, sigma_test) # Test Data -

plt.figure(figsize=(10,5))
plt.scatter(x_train, t_train, c='b', linewidths=3, label = 'Training Data')
plt.plot(x_true, t_true, 'g', linewidth=4, label = 'True Mapper')
plt.plot(x_test, t_test, 'r^', label = 'Test Data')
plt.legend(fontsize=15)
plt.xlabel('Data Samples, $x$',size=15)
plt.ylabel('Target Labels, $t$',size=15);
```
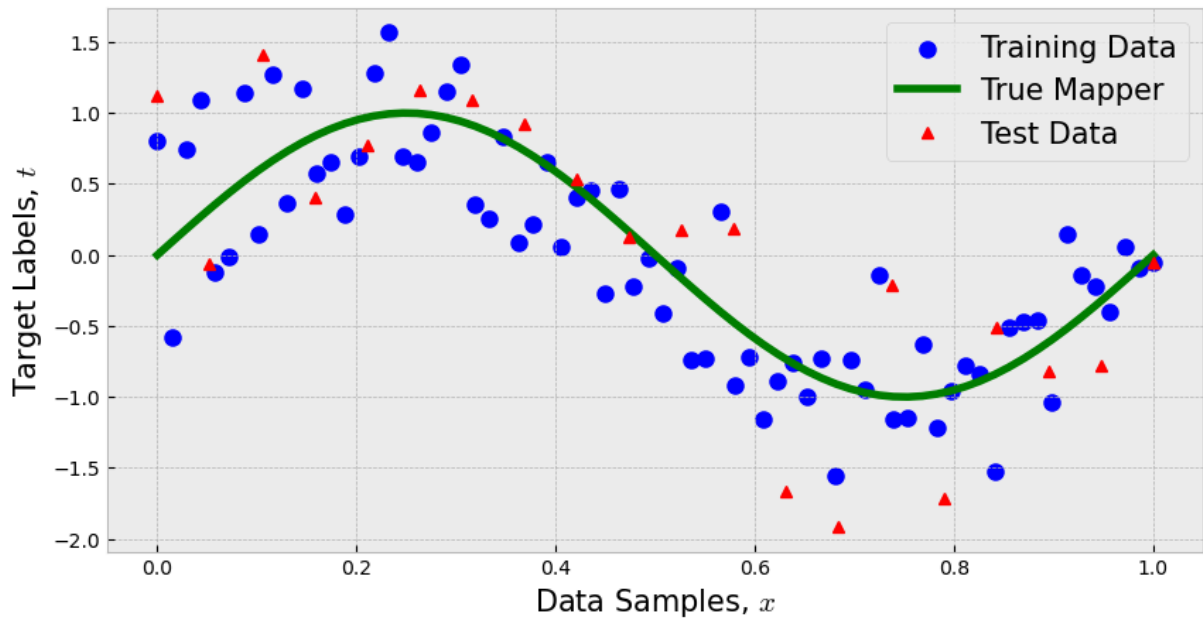
```
In [4]:  def PolynomialRegression(x,t,M):
             '''Fit a polynomial of order M to the data input data x and desire value
             MSE objective function.'''

             # Compute feature matrix X with polynomial features
             X = np.array([x**i for i in range(M+1)]).T # this creates an N-by-(M+1)

             # Compute the solution for the parameters w, using the MSE ojective func
             w = np.linalg.inv(X.T@X)@X.T@t

             # Compute model prediction
             y = X@w

             return w, y

         def PolynomialRegression_test(x_test, w):
             '''Use a trained linear regression model with polynomial features for in
             # Compute test feature matrix
             X_test = np.array([x_test**i for i in range(len(w))]).T # this is a N_te

             # Prediction for test samples using the trained model
             y_test = X_test@w

             return y_test

         def PolynomialRegression_reg(x,t,M,lam):
             '''Fit a polynomial of order M to the data input data x and desire value
             MSE objective function with the Ridge regularizer.'''

             # Compute feature matrix X with polynomial features
             X = np.array([x**i for i in range(M+1)]).T # this creates an N-by-(M+1)

             # Compute the solution for the parameters w, using the MSE ojective func
             w = np.linalg.inv(X.T@X + lam*np.eye(M+1))@X.T@t

             # Compute model prediction
```

```
        y = X@w

        return w, y
```

In [5]:
```
M = 15
lam = 0.001

w, y = PolynomialRegression(x_train,t_train,M)
w_reg, y_reg = PolynomialRegression_reg(x_train,t_train,M,lam)

fig=plt.figure(figsize=(10,5))
plt.scatter(x_train,t_train, label='Training Data')
plt.plot(x_train,y,'r', label = 'Polynomial Regression')
plt.plot(x_train,y_reg, 'b',label = 'Polynomial Regression w/ Regularizer')
plt.plot(x_true,t_true,'--g', label = 'True Function')
plt.legend(bbox_to_anchor=(1.5, 1),fontsize=12,ncol=1)
plt.xlabel('Data Samples, $x$', fontsize=20)
plt.ylabel('Desired Labels, $t$', fontsize=20);
plt.show()
```
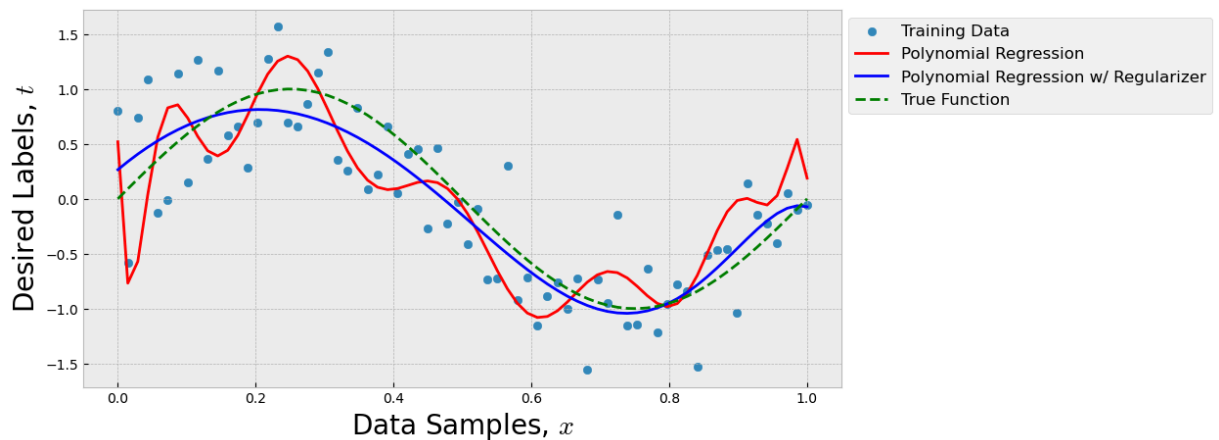


# Performance Measures for Regression Tasks

In order to determine if the model is able to **generalize** to a **validation set**, we need to determine a **performance measure**.

Which measures would you use to compare model performances?

1. Error measures are always a good start for **regression** tasks. Some examples include:

   - Mean Squared Error (MSE) - best when the data does not have outliers. The MSE will penalize outliers heavily.

   - Mean Absolute Error (MAE) - best when you suspect data has outliers.

   - Normalized mean squared error (NMSE).

- Normalized mean absolute error (NMAE).

2. Coefficient of Determination $r^2$

   - Advantage: it is bounded between $[0, 1]$, where values closer to 1 indicate a better prediction.

3. Quantile-Quantile plot (or Q-Q plot)

   - Qualitative measurement of the model predictions vs the target values.
   - The Q-Q plot is used to answer the following questions:
     - Do two data sets come from populations with a common distribution?
     - Do two data sets have common location and scale?
     - Do two data sets have similar distributional shapes?
     - Do two data sets have similar tail behavior?

```python
In [6]: plt.scatter(t_train, y)
        plt.xlabel('Target values')
        plt.ylabel('Predicted values');
```



```python
In [7]: ## Predictions in training/test sets with and without regularization
        y = PolynomialRegression_test(x_train, w)
        y_test = PolynomialRegression_test(x_test, w)

        y_reg = PolynomialRegression_test(x_train, w_reg)
        y_test_reg = PolynomialRegression_test(x_test, w_reg)

        ## Error Measures
```

```python
# Residual error for Training data for polynomial regression without and wit
error_train = t_train - y
error_train_reg = t_train - y_reg

# Residual error for Test data for polynomial regression without and with re
error_test = t_test - y_test
error_test_reg = t_test - y_test_reg

# Error Measures
print('Mean Squared Error \n')
print('Training Set')
print('Without regularizer: ', np.mean(error_train**2))
print('With regularizer: ', np.mean(error_train_reg**2),'\n')
print('Test Set')
print('Without regularizer: ', np.mean(error_test**2))
print('With regularizer: ', np.mean(error_test_reg**2),'\n')
print('----------------------------------------------------------------')
print('Mean Absolute Error \n')
print('Training Set')
print('Without regularizer: ', np.mean(np.abs(error_train)))
print('With regularizer: ', np.mean(np.abs(error_train_reg)),'\n')
print('Test Set')
print('Without regularizer: ', np.mean(np.abs(error_test)))
print('With regularizer: ', np.mean(np.abs(error_test_reg)),'\n')
```

```
Mean Squared Error

Training Set
Without regularizer:  0.20444327661371497
With regularizer:  0.15203267196569925

Test Set
Without regularizer:  0.37670836082928333
With regularizer:  0.32835509297670323


----------------------------------------------------------------
Mean Absolute Error

Training Set
Without regularizer:  0.34781656718207804
With regularizer:  0.31758497850818335

Test Set
Without regularizer:  0.5232536753801202
With regularizer:  0.5035873972508617
```

In [8]:
```python
## R2-SCORE

# it measures how much variance in one variance is explained by another vari

from sklearn.metrics import r2_score

print('Test set without regularization:', r2_score(t_test, y_test))

print('Test set with regularization:', r2_score(t_test, y_test_reg))
```

```
Test set without regularization: 0.5986462033315969
Test set with regularization: 0.6501628927707039
```

The coefficient of determination $r^2$ is bounded between $[0, 1]$. The closer to 1, the closer the predictions are to the target value.

In [9]:
```python
## QUANTILES

np.quantile(y, 0.5), np.median(y), np.mean(y)

# median
```

Out[9]: (0.03486456048980152, 0.03486456048980152, -0.03138699370766865)

In [10]:
```python
np.quantile(y,0), np.min(y)

# minimum
```

Out[10]: (-1.0806018477933437, -1.0806018477933437)

In [12]:
```python
np.quantile(y, 1), np.max(y)

# maximum
```

Out[12]: (1.2993581372520955, 1.2993581372520955)

In [13]:
```python
np.linspace(0,1,10)
```

Out[13]: array([0.        , 0.11111111, 0.22222222, 0.33333333, 0.44444444,
       0.55555556, 0.66666667, 0.77777778, 0.88888889, 1.        ])

In [14]:
```python
np.quantile(y, np.linspace(0,1,10))
```

Out[14]: array([-1.08060185, -0.94390895, -0.74596665, -0.49708891, -0.02121674,
        0.09751416,  0.2765502 ,  0.55469791,  0.8378803 ,  1.29935814])

In [17]:
```python
# Histograms of RV samples

plt.hist(t_train, alpha=0.5, label='Target')
plt.hist(y, alpha=0.5, label='Pred. w/out reg.')
plt.hist(y_reg, alpha=0.5, label='Pred. w/ reg.')
plt.legend();
```
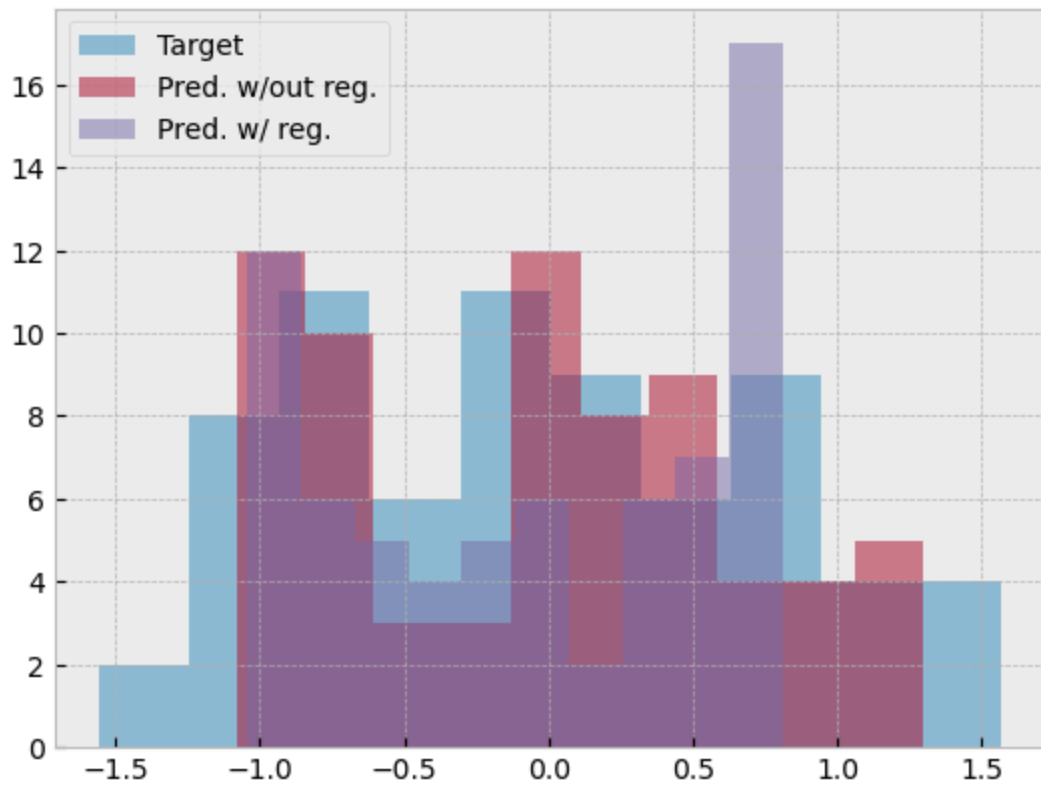
In [15]: 
```python
# Q-Q plot

plt.scatter(np.quantile(t_train, np.linspace(0,1,len(t_train))),
            np.quantile(y, np.linspace(0,1,len(t_train))))
plt.xlabel('True Quantiles')
plt.ylabel('Predicted Quantiles')
plt.title('Q-Q Plot');
```
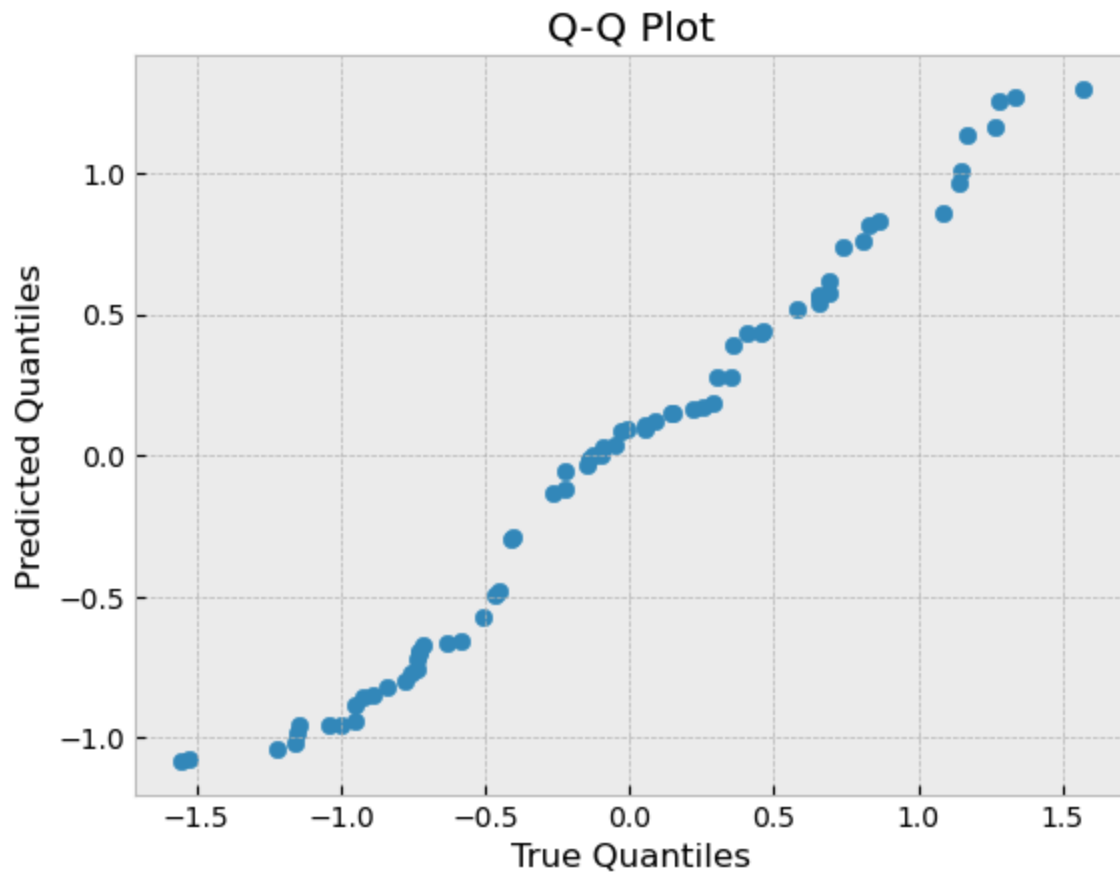
Q-Q Plot

```
# alternative way to plot the Q-Q plot

plt.scatter(np.sort(t_train), np.sort(y));
plt.xlabel('True Quantiles')
plt.ylabel('Predicted Quantiles')
plt.title('Q-Q Plot');
```
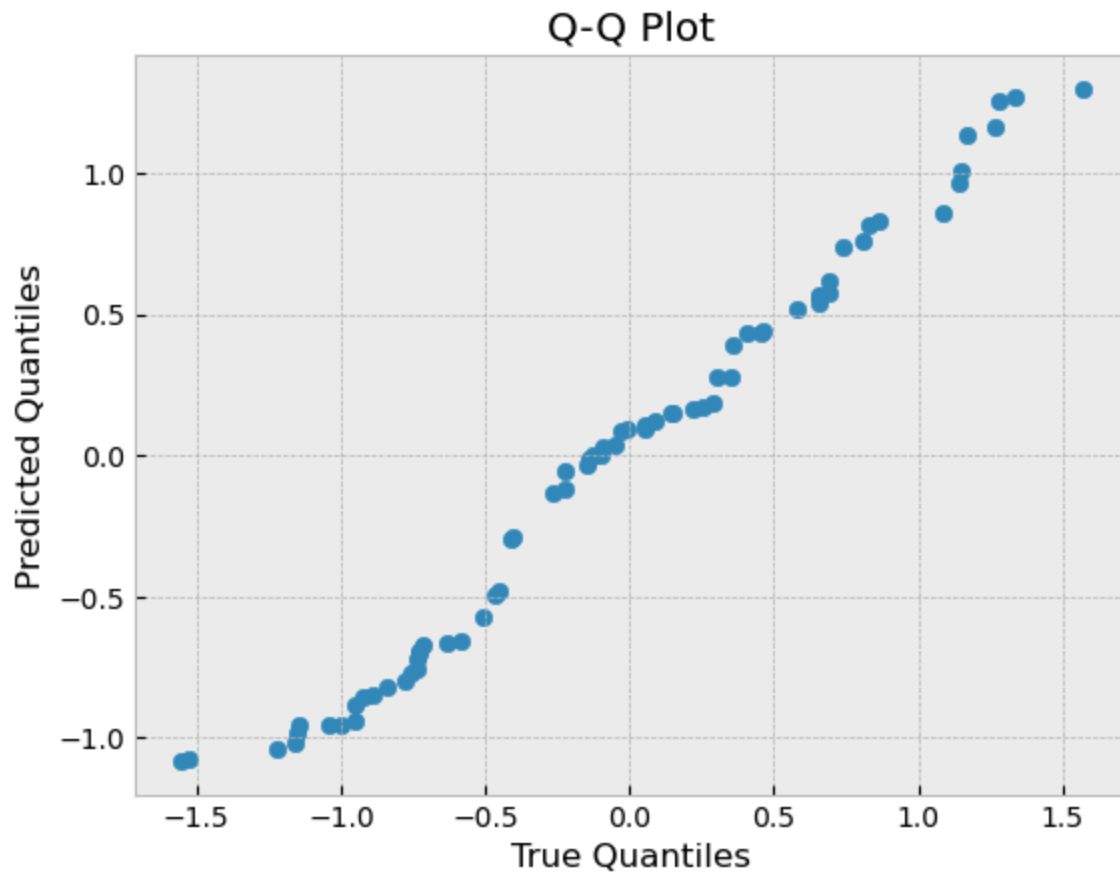
Q-Q Plot

```
base = np.linspace(min(t_train)-0.1,max(t_train)+0.1,100)
plt.plot(base,base,'r')
plt.scatter(np.sort(t_train), np.sort(y))
plt.xlabel('True Quantiles')
plt.ylabel('Predicted Quantiles')
plt.title('Q-Q Plot');
```

## Q-Q Plot

```python
print('R2 Score for Training without regularizer:', r2_score(np.sort(t_train
print('R2 Score for Test without regularizer:', r2_score(np.sort(t_test), np
```
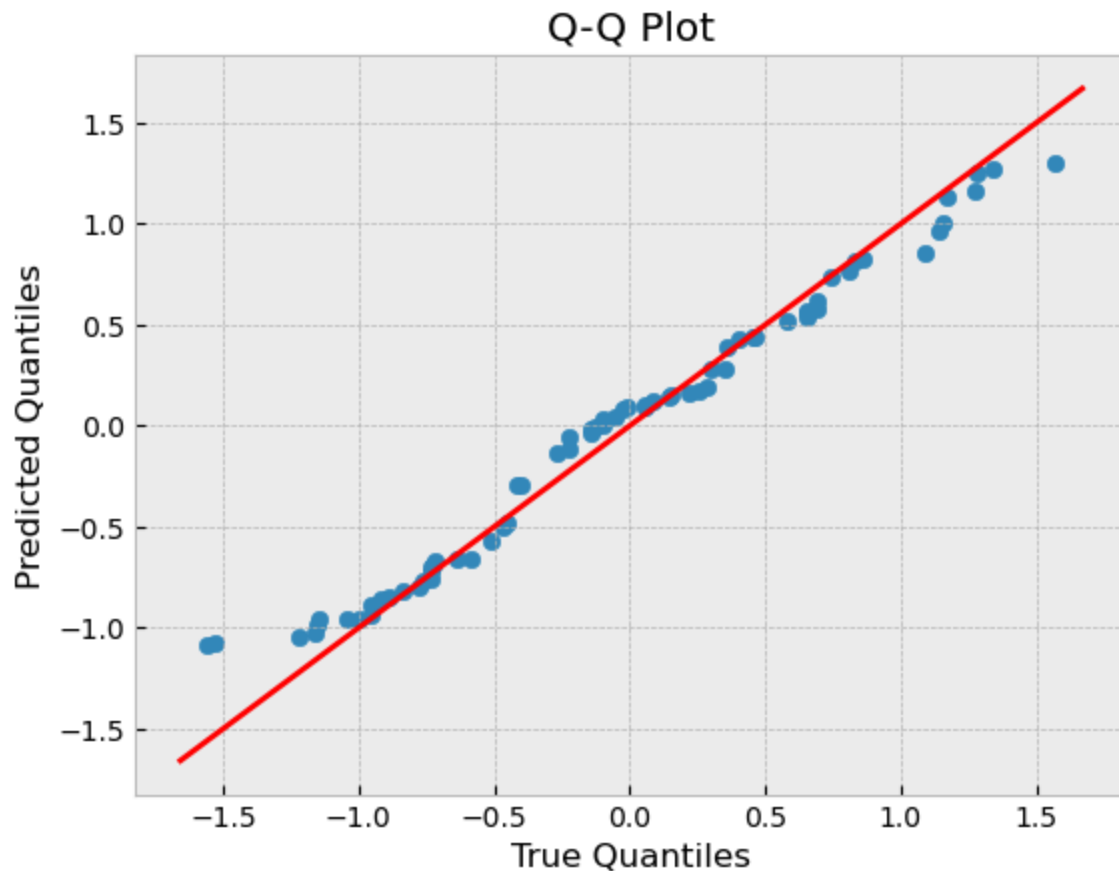
```
R2 Score for Training without regularizer: 0.9743003977521254
R2 Score for Test without regularizer: 0.8586566349466151
```

```python
print('R2 Score for Training with regularizer:', r2_score(np.sort(t_train),
print('R2 Score for Test with regularizer:', r2_score(np.sort(t_test), np.sc
```

```
R2 Score for Training with regularizer: 0.9350269752654546
R2 Score for Test with regularizer: 0.8424480436609958
```

In practice, we consider a good fit if the $r^2$ of the Q-Q plot if **greater than 0.9**, ideally >0.99.

# Other Performance Measures

Performance of an algorithm can be determined using a variety of statistical goodness-of-fit measures.

- For regression tasks this includes error-based measurements, hypothesis tests, Q-Q plots.
- For classification tasks this includes error rate, accuracy, ROC curves, performance-recall curves.

But it can also be in terms of:

1. Risk,
2. Training time,
3. Training storage/memory,
4. Testing time,
5. Testing storage/memory,
6. Interpretability, namely, whether the method allows knowledge extraction which can be checked and validated by experts, and
7. computational complexity.

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# Strategies to Mitigate Overfitting

1. Add more data! - when possible

2. Occam's Razor - select a model with lower complexity

3. Regularization - constrains/regularizes the coefficients of the model

4. Cross-validation - technique for utilizing the training data to fine-tune hyperparameter values

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# Cross-Validation

The goal of **cross-validation**, or CV, is to test the model's ability to predict new data that was not used in estimating the model, in order to flag problems like overfitting or selection bias and to give an insight on how the model will generalize to an independent dataset (i.e., an unknown dataset).

Cross-validation allows us to determine the values for the hyperparameter that provide the most **generalization**. Cross-validation mitigates the occurrrence of overfitting, but it does not eliminate it entirely.

Suggested reading:

- Sections 19.1-19.6 from the Alpaydin textbook
- Section 5.3 Hyperparameters and Model Validation from the "Python Data Science Handbook" textbook.

# Strategies of Experimentation - Fine-Tuning Hyperparameters

To fully test a system, you want to try to evaluate each of these parameters separately. However, this is often not easily done.

A few strategies for fine-tuning hyperparameters include:

- Best guess
- One factor at a time
- Factorial design or **grid search**
- Randomized search

In [21]:
```python
from IPython.display import Image
Image('figures/Experimentation.png',width=800)
# Source: Alpaydin, E. (2014) Introduction to Machine Learning. 3rd edition,
```

Out[21]:



(a) Best guess    (b) One factor at a time    (c) Factorial design
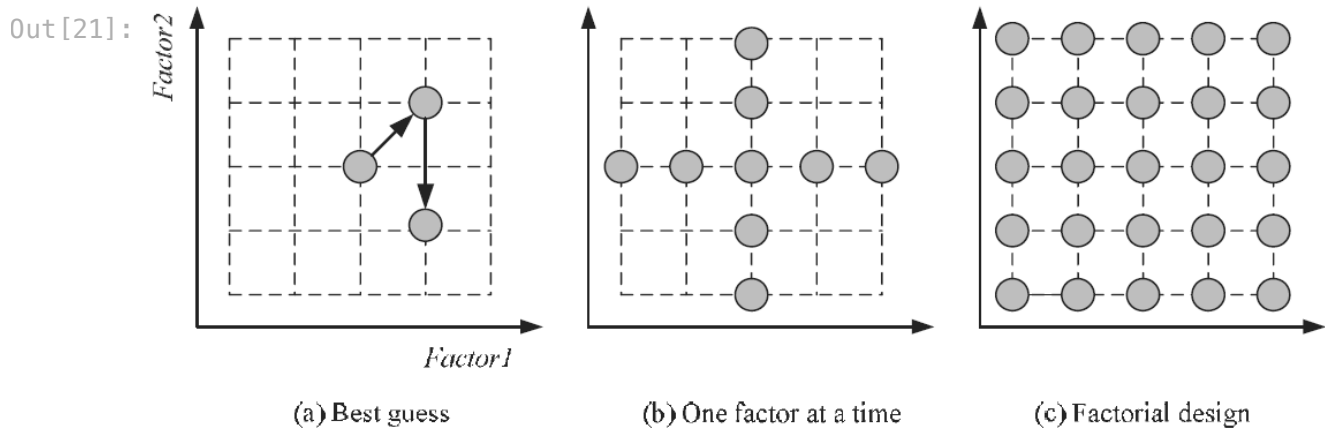
We first must select a **performance measure**, e.g. mean square error (MSE), coefficient of determination $r^2$. There are different strategies for implementing cross-validation:

1. $k \times 2$ cross-validation
2. k-fold cross-validation
3. Leave-One-Out cross-validation
4. Stratified cross-validation

We also need to make sure that classes are represented in the right proportions when subsets of data are held out, not to disturb the class prior probabilities; this is called **stratification**. If a class has 20 percent examples in the whole dataset, in all samples drawn from the dataset, it should also have approximately 20 percent examples.

# $1 \times 2$ cross-validation

Let's consider the case, where we only have a single validation set which resulted from splitting the training data into a training set and a validation set with splitting rations 70% and 30% respectively.

```
In [22]: from sklearn.model_selection import train_test_split

         x_train2, x_validation, t_train2, t_validation = train_test_split(x_train, t
                                                                           test_size=
                                                                           shuffle=Tr
                                                                           random_stat

         x_train2.shape, x_validation.shape, t_train2.shape, t_validation.shape
```

```
Out[22]: ((49,), (21,), (49,), (21,))
```

Let's now vary the values for $M$ and estimate the associated coefficients $\mathbf{w}$ using the training set. Then, let's evaluate performance measure (e.g. MSE) in both training and validation sets:

```
In [23]: # Range of values for M
         M_vals = range(1,11)

         perf_train = []
         perf_val = []
         for M in M_vals:

             # Train the model (without regularization for simplicity of illustration
             w, y_train = PolynomialRegression(x_train2, t_train2, M)

             # Make predictions for the training and validation sets
             y_validation = PolynomialRegression_test(x_validation, w)

             # Performance Measure (MSE)
             perf_train += [np.mean(t_train2-y_train)**2]
             perf_val += [np.mean(t_validation-y_validation)**2]

         # Plotting results
         plt.figure(figsize=(10,3))
         plt.plot(M_vals, perf_train, '-og',label='Training Set')
         plt.plot(M_vals, perf_val, '-or',label='Validation Set')
         plt.legend(fontsize=15)
         plt.xlabel('Model order, $M$', size=12)
         plt.ylabel('Performance Measure', size=12);
```
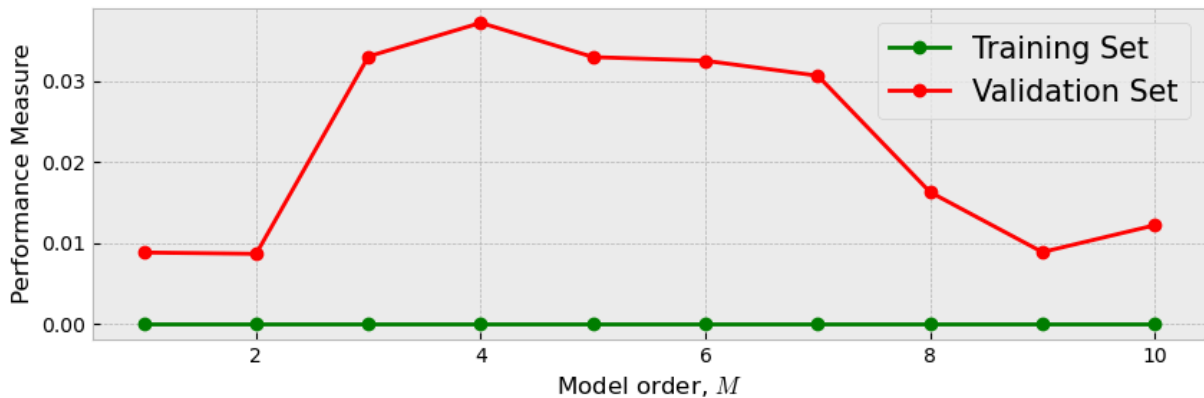
# K-Fold Cross-Validation

The technique of k-fold cross-validation, illustrated below for the case of $k = 4$, involves taking the available data and partitioning it into $k$ groups (in the simplest case these are of equal size). Then $k - 1$ of the groups are used to train a set of models that are then evaluated on the remaining group. This procedure is then repeated for all $k$ possible choices for the held-out group, indicated in the picture below by the red blocks, and the performance scores from the runs are then averaged.

$K$ is typically 10 or 30. As $K$ increases, the percentage of training instances increases and we get more robust estimators, but the validation set becomes smaller. Furthermore, there is the cost of training the classifier $K$ times, which increases as $K$ is increased. As $N$ increases, $K$ can be smaller; if $N$ is small, $K$ should be large to allow large enough training sets.

```
In [24]: Image('figures/Kfold CV.png',width=400)
```

Out[24]:
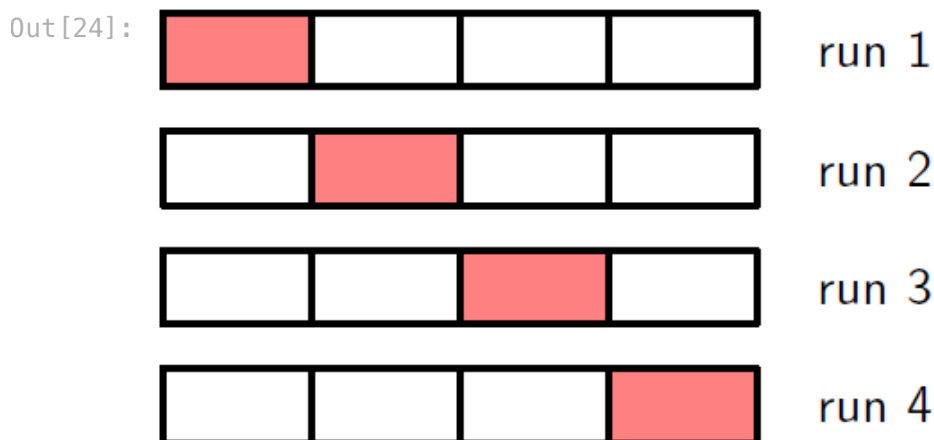


```
In [25]: from sklearn.model_selection import KFold

         KFold?
```

**Goal:** find the best value for the **hyperparameters** $M$ (model order) and $\lambda$ (regularization trade-off parameter).

Let's use **4-fold cross-validation** on this data:

```
In [39]: k = 4 # number of folds

         kf = KFold(n_splits=k,shuffle=True, random_state=0)
         kf
```

```
Out[39]: KFold(n_splits=4, random_state=None, shuffle=True)
```

```
In [40]: # Split training feature matrix into training and validation sets

         f=1
         for train_index, validation_index in kf.split(x_train):
             print('Fold ', f)
             print('The training set has ', train_index.shape[0],' samples')
             print('Their index locations are: ', train_index)
             print('The validation set has ', validation_index.shape[0],' samples')
             print('Their index locations are: ', validation_index,'\n')
             f+=1

         # [ 9 15 17 18 24 27 29 34 36 37 40 44 45 49 54 64 65 68]
```

```
Fold  1
The training set has  52  samples
Their index locations are:  [ 0  1  2  3  6  8  9 10 11 12 13 14 16 17 18 19
20 21 23 24 25 26 27 28
 29 30 31 32 35 36 39 40 42 43 47 49 50 51 52 53 55 56 57 58 59 60 61 63
 64 67 68 69]
The validation set has  18  samples
Their index locations are:  [ 4  5  7 15 22 33 34 37 38 41 44 45 46 48 54 62
65 66]

Fold  2
The training set has  52  samples
Their index locations are:  [ 0  4  5  7  8  9 10 11 12 13 15 18 19 22 24 25
26 27 29 32 33 34 35 36
 37 38 39 40 41 42 43 44 45 46 47 48 49 50 52 54 55 56 57 59 60 62 63 64
 65 66 67 69]
The validation set has  18  samples
Their index locations are:  [ 1  2  3  6 14 16 17 20 21 23 28 30 31 51 53 58
61 68]

Fold  3
The training set has  53  samples
Their index locations are:  [ 1  2  3  4  5  6  7  8 11 12 14 15 16 17 18 20
21 22 23 24 25 27 28 30
 31 32 33 34 35 36 37 38 39 41 44 45 46 48 49 51 52 53 54 55 58 60 61 62
 63 65 66 67 68]
The validation set has  17  samples
Their index locations are:  [ 0  9 10 13 19 26 29 40 42 43 47 50 56 57 59 64
69]

Fold  4
The training set has  53  samples
Their index locations are:  [ 0  1  2  3  4  5  6  7  9 10 13 14 15 16 17 19
20 21 22 23 26 28 29 30
 31 33 34 37 38 40 41 42 43 44 45 46 47 48 50 51 53 54 56 57 58 59 61 62
 64 65 66 68 69]
The validation set has  17  samples
Their index locations are:  [ 8 11 12 18 24 25 27 32 35 36 39 49 52 55 60 63
67]
```

In [28]:
```python
from sklearn.metrics import r2_score # performance measure

# Set of values for lambda to explore
M_vals = np.array(range(2,11))
lam_vals= np.arange(0.01,1.1,0.01)

# Average validation score approach in K-fold CV
avg_train = np.zeros((len(M_vals), len(lam_vals)))
avg_valid  = np.zeros((len(M_vals), len(lam_vals)))

for i in range(len(M_vals)):
    for j in range(len(lam_vals)):

        M   = M_vals[i]
        lam = lam_vals[j]
```

```python
        print('M Value = ',M)
        print('Lambda Value = ',lam)

        # For each training/validation split
        f=1

        #initialize performance measures
        perf_train_avg, perf_val_avg = 0, 0

        for train_index, validation_index in kf.split(x_train):
            print('\nFold ',f)

            # Select training set using the indices found from kf.split
            x_train2, x_validation = x_train[train_index], x_train[validatic

            # Select validation set using the indices found from kf.split
            t_train2, t_validation = t_train[train_index], t_train[validatic

            # Training model with training set
            w, y_train = PolynomialRegression_reg(x_train2, t_train2, M, lam

            # Evaluate trained model in validation set
            y_val = PolynomialRegression_test(x_validation, w)

            # Performance Measure (r^2 score of predictions)
            perf_train = r2_score(t_train2,y_train) #np.mean((t_train2-y_tra
            perf_val   = r2_score(t_validation, y_val) #np.mean((t_validatic

            # Average performance measure
            perf_train_avg = perf_train_avg + perf_train
            perf_val_avg = perf_val_avg + perf_val
            print('Performance Training = ', perf_train)
            print('Performance Validation = ', perf_val)
            f+=1

    # Average Performance
    avg_train[i,j] = perf_train_avg/k
    avg_valid[i,j] = perf_val_avg/k

    print('\nAverage Performance in Training = ', avg_train[i,j])
    print('Average Performance in Validation = ', avg_valid[i,j])
    print('---------------------------------------------------\n')
```

```
M Value =  2
Lambda Value =  0.01

Fold  1
Performance Training =  0.46466946927732133
Performance Validation =  0.36645158784766685

Fold  2
Performance Training =  0.4373265727470126
Performance Validation =  0.5351814231642463

Fold  3
Performance Training =  0.4259089870813718
Performance Validation =  0.35694234951955695

Fold  4
Performance Training =  0.5539559409024889
Performance Validation =  0.2454894948480698

Average Performance in Training =  0.4704652425020487
Average Performance in Validation =  0.37601621384488493
----------------------------------------------------

M Value =  2
Lambda Value =  0.02

Fold  1
Performance Training =  0.46428450360971196
Performance Validation =  0.3588521160737447

Fold  2
Performance Training =  0.4368970960549976
Performance Validation =  0.5310118450590449

Fold  3
Performance Training =  0.42514508351889246
Performance Validation =  0.35747998747647647

Fold  4
Performance Training =  0.5530554553507099
Performance Validation =  0.25118350330439954

Average Performance in Training =  0.469845534633578
Average Performance in Validation =  0.37463186297841644
----------------------------------------------------

M Value =  2
Lambda Value =  0.03

Fold  1
Performance Training =  0.46374692069565127
Performance Validation =  0.35170441771659977

Fold  2
Performance Training =  0.436301231756111
Performance Validation =  0.5270474066486097
```

Fold  3
Performance Training =  0.4240679969880893
Performance Validation =  0.35756306041921027


Fold  4
Performance Training =  0.5517893248290594
Performance Validation =  0.2558834708492461


Average Performance in Training =  0.4689763685672278
Average Performance in Validation =  0.37304958890841644
------------------------------------------------------

M Value =  2
Lambda Value =  0.04

Fold  1
Performance Training =  0.4631112433930372
Performance Validation =  0.34501192653707935


Fold  2
Performance Training =  0.4356007503431929
Performance Validation =  0.523299048319655


Fold  3
Performance Training =  0.4227834582579517
Performance Validation =  0.3573083339826282


Fold  4
Performance Training =  0.5502831184368095
Performance Validation =  0.25980113356589496


Average Performance in Training =  0.4679446426077478
Average Performance in Validation =  0.3713551106013144
------------------------------------------------------

M Value =  2
Lambda Value =  0.05

Fold  1
Performance Training =  0.46241492514144034
Performance Validation =  0.3387621727320633


Fold  2
Performance Training =  0.4348374784395501
Performance Validation =  0.5197662180698027


Fold  3
Performance Training =  0.4213658113796288
Performance Validation =  0.35680108871525906


Fold  4
Performance Training =  0.5486245711997066
Performance Validation =  0.2630955981632781


Average Performance in Training =  0.4668106965400815

Average Performance in Validation =  0.36960626942010083
------------------------------------------------------

M Value =  2
Lambda Value =  0.06

Fold  1
Performance Training =  0.46168388823778894
Performance Validation =  0.33293421302430093

Fold  2
Performance Training =  0.4340399559029252
Performance Validation =  0.5164419574585534

Fold  3
Performance Training =  0.41986770703452314
Performance Validation =  0.3561043786879121

Fold  4
Performance Training =  0.5468754307513681
Performance Validation =  0.26588816701368756

Average Performance in Training =  0.4656167454816514
Average Performance in Validation =  0.3678421790461135
------------------------------------------------------

M Value =  2
Lambda Value =  0.07

Fold  1
Performance Training =  0.46093614839404506
Performance Validation =  0.32750303640679745

Fold  2
Performance Training =  0.43322773034116335
Performance Validation =  0.5133159245336227

Fold  3
Performance Training =  0.4183265988617334
Performance Validation =  0.35526532601805894

Fold  4
Performance Training =  0.5450793455551772
Performance Validation =  0.2682725320518936

Average Performance in Training =  0.4643924557880298
Average Performance in Validation =  0.3660892047525932
------------------------------------------------------

M Value =  2
Lambda Value =  0.08

Fold  1
Performance Training =  0.46018423104955186
Performance Validation =  0.3224421707948235

```
Fold  2
Performance Training =  0.4324141823550103
Performance Validation =  0.5103761976537872


Fold  3
Performance Training =  0.4167691702114178
Performance Validation =  0.3543194758931747


Fold  4
Performance Training =  0.5432672080680087
Performance Validation =  0.270321915606317


Average Performance in Training =  0.4631586979209972
Average Performance in Validation =  0.36436493998702557
------------------------------------------------------

M Value =  2
Lambda Value =  0.09

Fold  1
Performance Training =  0.4594368086629349
Performance Validation =  0.31772520552578865


Fold  2
Performance Training =  0.43160841645351244
Performance Validation =  0.5076103474804745


Fold  3
Performance Training =  0.4152143955993869
Performance Validation =  0.3532938576109774


Fold  4
Performance Training =  0.5414608294136267
Performance Validation =  0.27209415713047624


Average Performance in Training =  0.4619301125323652
Average Performance in Validation =  0.3626808919369292
------------------------------------------------------

M Value =  2
Lambda Value =  0.1

Fold  1
Performance Training =  0.4586998262236348
Performance Validation =  0.3133266548159497


Fold  2
Performance Training =  0.4308165459208445
Performance Validation =  0.5050060644381236


Fold  3
Performance Training =  0.4136756860363373
Performance Validation =  0.3522091670146552


Fold  4
Performance Training =  0.5396755009529769
```

```
Performance Validation =  0.2736353922660888

Average Performance in Training =  0.4607168897834484
Average Performance in Validation =  0.3610443196337043
-------------------------------------------------------

M Value =  2
Lambda Value =  0.11

Fold  1
Performance Training =  0.4579772848504947
Performance Validation =  0.30922241896396274

Fold  2
Performance Training =  0.4300425775493959
Performance Validation =  0.5025515140767874

Fold  3
Performance Training =  0.41216241013493216
Performance Validation =  0.35108134277548286

Fold  4
Performance Training =  0.5379218014962011
Performance Validation =  0.2749827509576871

Average Performance in Training =  0.45952601850775593
Average Performance in Validation =  0.35945950669348004
-------------------------------------------------------

M Value =  2
Lambda Value =  0.12

Fold  1
Performance Training =  0.457271793486844
Performance Validation =  0.30539000041696274

Fold  2
Performance Training =  0.4292890279688759
Performance Validation =  0.5002355253763273

Fold  3
Performance Training =  0.4106809839512452
Performance Validation =  0.3499227183688465

Fold  4
Performance Training =  0.5362068859678075
Performance Validation =  0.27616636145807694

Average Performance in Training =  0.4583621728436932
Average Performance in Validation =  0.35792865140505337
-------------------------------------------------------

M Value =  2
Lambda Value =  0.13

Fold  1
```

```
Performance Training =  0.45658496115154623
Performance Validation =  0.3018085717816068


Fold  2
Performance Training =  0.4285573573540655
Performance Validation =  0.49804767675010186


Fold  3
Performance Training =  0.4092356591029914
Performance Validation =  0.34874287306239193


Fold  4
Performance Training =  0.5345354130112568
Performance Validation =  0.2772108562607444


Average Performance in Training =  0.457228347654965
Average Performance in Validation =  0.3564524944637112
------------------------------------------------------

M Value =  2
Lambda Value =  0.14


Fold  1
Performance Training =  0.45591767821155826
Performance Validation =  0.29845895617302043


Fold  2
Performance Training =  0.4278482772795166
Performance Validation =  0.4959783200381557


Fold  3
Performance Training =  0.40782909737319495
Performance Validation =  0.3475492667750032


Fold  4
Performance Training =  0.5329102182442981
Performance Validation =  0.2781365159923739


Average Performance in Training =  0.45612631777714197
Average Performance in Validation =  0.3550307647446383
------------------------------------------------------

M Value =  2
Lambda Value =  0.15


Fold  1
Performance Training =  0.4552703195497777
Performance Validation =  0.2953235575929617


Fold  2
Performance Training =  0.4271619708419676
Performance Validation =  0.49401856770969865


Fold  3
Performance Training =  0.40646279264601515
Performance Validation =  0.3463477179895361
```

```
Fold  4
Performance Training =  0.5313328064355297
Performance Validation =  0.2789601469947435

Average Performance in Training =  0.45505697236832254
Average Performance in Validation =  0.35366249757173496
------------------------------------------------------

M Value =  2
Lambda Value =  0.16

Fold  1
Performance Training =  0.4546428922129413
Performance Validation =  0.29238626483857466

Fold  2
Performance Training =  0.42649825099201044
Performance Validation =  0.49216025910287886

Fold  3
Performance Training =  0.4051373826489155
Performance Validation =  0.3451427665104583

Fold  4
Performance Training =  0.5298037135254006
Performance Validation =  0.27969576084170544

Average Performance in Training =  0.454020559844817
Average Performance in Validation =  0.3523462628234043
------------------------------------------------------

M Value =  2
Lambda Value =  0.17

Fold  1
Performance Training =  0.45403514323796557
Performance Validation =  0.28963234350297273

Fold  2
Performance Training =  0.42585667494388146
Performance Validation =  0.49039591562050966

Fold  3
Performance Training =  0.40385288047601997
Performance Validation =  0.34393795091686286

Fold  4
Performance Training =  0.5283227742796992
Performance Validation =  0.28035510503222827

Average Performance in Training =  0.4530168682343916
Average Performance in Validation =  0.35108032876814343
------------------------------------------------------

M Value =  2
```

```
Lambda Value =  0.18

Fold  1
Performance Training =  0.453446638685839
Performance Validation =  0.2870483249654484

Fold  2
Performance Training =  0.4252366271086142
Performance Validation =  0.48871869105430943

Fold  3
Performance Training =  0.4026088472601723
Performance Validation =  0.3427360222608713

Fold  4
Performance Training =  0.5268893209854648
Performance Validation =  0.2809480807874135

Average Performance in Training =  0.4520453585100226
Average Performance in Validation =  0.34986277976701063
-----------------------------------------------------

M Value =  2
Lambda Value =  0.19

Fold  1
Performance Training =  0.45287682170798227
Performance Validation =  0.28462189767113866

Fold  2
Performance Training =  0.4246373793063515
Performance Validation =  0.4871223208235106

Fold  3
Performance Training =  0.40140452136718463
Performance Validation =  0.3415391097236299

Fold  4
Performance Training =  0.5255023314012384
Performance Validation =  0.2814830744402954

Average Performance in Training =  0.4511052634456892
Average Performance in Validation =  0.34869160066464366
-----------------------------------------------------

M Value =  2
Lambda Value =  0.2

Fold  1
Performance Training =  0.4523250552467156
Performance Validation =  0.28234180371528894

Fold  2
Performance Training =  0.4240581344748847
Performance Validation =  0.48560107238930417
```

```
Fold  3
Performance Training =  0.4002389152679423
Performance Validation =  0.34034884979100144


Fold  4
Performance Training =  0.5241605391280688
Performance Validation =  0.28196722213905867


Average Performance in Training =  0.45019566102940284
Average Performance in Validation =  0.3475647370086633
----------------------------------------------------

M Value =  2
Lambda Value =  0.21

Fold  1
Performance Training =  0.451790653412951
Performance Validation =  0.2801977423028498


Fold  2
Performance Training =  0.4234980583260459
Performance Validation =  0.48414969813364905


Fold  3
Performance Training =  0.39911088824725016
Performance Validation =  0.33916648753060485


Fold  4
Performance Training =  0.5228625159960658
Performance Validation =  0.28240662267999306


Average Performance in Training =  0.44931552899557825
Average Performance in Validation =  0.34648013766177416
----------------------------------------------------

M Value =  2
Lambda Value =  0.22

Fold  1
Performance Training =  0.45127290448127244
Performance Validation =  0.2781802807499818


Fold  2
Performance Training =  0.4229563021618168
Performance Validation =  0.4827633913729853


Fold  3
Performance Training =  0.39801920095992693
Performance Validation =  0.3379929563913282


Fold  4
Performance Training =  0.5216067335099127
Performance Validation =  0.2828065096974832


Average Performance in Training =  0.44846378527823216
Average Performance in Validation =  0.34543578455294466
```

```
------------------------------------------------------

M Value =  2
Lambda Value =  0.23

Fold  1
Performance Training =  0.45077108765516094
Performance Validation =  0.276280773138214

Fold  2
Performance Training =  0.422432019183556
Performance Validation =  0.48143774578875576

Fold  3
Performance Training =  0.3969625562915067
Performance Validation =  0.33682894136597785

Fold  4
Performance Training =  0.5203916085585669
Performance Validation =  0.283171391787453

Average Performance in Training =  0.44763931792219763
Average Performance in Validation =  0.34442971302010017
------------------------------------------------------

M Value =  2
Lambda Value =  0.24

Fold  1
Performance Training =  0.45028448518836983
Performance Validation =  0.2744912864005139

Fold  2
Performance Training =  0.42192437600004973
Performance Validation =  0.4801687183166595

Fold  3
Performance Training =  0.3959396298493396
Performance Validation =  0.33567492919240194

Fold  4
Performance Training =  0.5192155372596532
Performance Validation =  0.2835051671655623

Average Performance in Training =  0.4468410070743531
Average Performance in Validation =  0.3434600252687844
------------------------------------------------------

M Value =  2
Lambda Value =  0.25

Fold  1
Performance Training =  0.44981239103745196
Performance Validation =  0.27280453343140343

Fold  2
```

```
Performance Training  =  0.4214325605881736
Performance Validation  =  0.47895259539283674


Fold  3
Performance Training  =  0.3949490925794721
Performance Validation  =  0.3345312484020233


Fold  4
Performance Training  =  0.5180769198326558
Performance Validation  =  0.2838112179776776


Average Performance in Training  =  0.4460677410094378
Average Performance in Validation  =  0.34252489880098524
------------------------------------------------------

M Value  =  2
Lambda Value  =  0.26


Fold  1
Performance Training  =  0.4493541169202928
Performance Validation  =  0.27121381271805123


Fold  2
Performance Training  =  0.4209557876322002
Performance Validation  =  0.47778596237367155


Fold  3
Performance Training  =  0.393989627391118
Performance Validation  =  0.33339810137609593


Fold  4
Performance Training  =  0.5169741786759752
Performance Validation  =  0.2840924882568


Average Performance in Training  =  0.44531842765489654
Average Performance in Validation  =  0.3416225911811547
------------------------------------------------------

M Value  =  2
Lambda Value  =  0.27


Fold  1
Performance Training  =  0.4489089964349089
Performance Validation  =  0.26971295395209316


Fold  2
Performance Training  =  0.4204933019286744
Performance Validation  =  0.47666567590419995


Fold  3
Performance Training  =  0.3930599412143805
Performance Validation  =  0.33227559008089214


Fold  4
Performance Training  =  0.515905771289919
Performance Validation  =  0.2843515486638972
```

```
Average Performance in Training =  0.44459200271697075
Average Performance in Validation =  0.3407514421502706
-----------------------------------------------------

M Value =  2
Lambda Value =  0.28

Fold  1
Performance Training =  0.44847638772964227
Performance Validation =  0.2682962690804014

Fold  2
Performance Training =  0.42004438036803016
Performance Validation =  0.4755888389937012

Fold  3
Performance Training =  0.3921587735757275
Performance Validation =  0.3311637367817716

Fold  4
Performance Training =  0.5148701992903755
Performance Validation =  0.28459065049212884

Average Performance in Training =  0.4438874352409439
Average Performance in Validation =  0.3399098738370008
-----------------------------------------------------

M Value =  2
Lambda Value =  0.29

Fold  1
Performance Training =  0.4480556750946312
Performance Validation =  0.2669585082727841

Fold  2
Performance Training =  0.4196083328746302
Performance Validation =  0.47455277855623335

Fold  3
Performance Training =  0.39128490251920633
Performance Validation =  0.33006250075265964

Fold  4
Performance Training =  0.5138660144600684
Performance Validation =  0.28481177090530596

Average Performance in Training =  0.443203731237134
Average Performance in Validation =  0.33909638962174576
-----------------------------------------------------

M Value =  2
Lambda Value =  0.3

Fold  1
Performance Training =  0.44764626975383714
```

Performance Validation =  0.2656948203161872

Fold  2
Performance Training =  0.41918450259059725
Performance Validation =  0.4735550251824342

Fold  3
Performance Training =  0.39043714850754485
Performance Validation =  0.3289717917796451

Fold  4
Performance Training =  0.5128918225598724
Performance Validation =  0.28501665098572415

Average Performance in Training =  0.4425399358529629
Average Performance in Validation =  0.33830957206599765
------------------------------------------------------

M Value =  2
Lambda Value =  0.31

Fold  1
Performance Training =  0.44724761006889047
Performance Validation =  0.2645007169823671

Fold  2
Performance Training =  0.4187722655172035
Performance Validation =  0.47259329492275126

Fold  3
Performance Training =  0.38961437679010724
Performance Validation =  0.32789148108923194

Fold  4
Performance Training =  0.5119462854528543
Performance Validation =  0.2852068278568446

Average Performance in Training =  0.44189513445726386
Average Performance in Validation =  0.3375480802127987
------------------------------------------------------

M Value =  2
Lambda Value =  0.32

Fold  1
Performance Training =  0.44685916131477943
Performance Validation =  0.2633720409554642

Fold  2
Performance Training =  0.4183710297739306
Performance Validation =  0.4716654728786993

Fold  3
Performance Training =  0.3888154986124507
Performance Validation =  0.32682141020110467

```
Fold  4
Performance Training =  0.5110281219645834
Performance Validation =  0.28538366190257836

Average Performance in Training =  0.441268452916436
Average Performance in Validation =  0.3368106464844617
------------------------------------------------------

M Value =  2
Lambda Value =  0.33

Fold  1
Performance Training =  0.44648041514863535
Performance Validation =  0.26230493694505663

Fold  2
Performance Training =  0.4179802345950786
Performance Validation =  0.4707695984161826

Fold  3
Performance Training =  0.388039471556356
Performance Validation =  0.3257613981034406

Fold  4
Performance Training =  0.5101361078047666
Performance Validation =  0.28554835991206406

Average Performance in Training =  0.44065905727620913
Average Performance in Validation =  0.336096073344186
------------------------------------------------------

M Value =  2
Lambda Value =  0.34

Fold  1
Performance Training =  0.44611088886343564
Performance Validation =  0.2612958256476777

Fold  2
Performance Training =  0.4175993491534792
Performance Validation =  0.4699038518322174

Fold  3
Performance Training =  0.3872852992332012
Performance Validation =  0.3247112470687238

Fold  4
Performance Training =  0.5092690747998232
Performance Validation =  0.2857019948254269

Average Performance in Training =  0.4400661530124848
Average Performance in Validation =  0.33540322984351145
------------------------------------------------------

M Value =  2
Lambda Value =  0.35000000000000003
```

```
Fold  1
Performance Training =  0.4457501244960749
Performance Validation =  0.26034138025477127

Fold  2
Performance Training =  0.417227871278014
Performance Validation =  0.46906654232302936

Fold  3
Performance Training =  0.3865520305027128
Performance Validation =  0.3236707473652164

Fold  4
Performance Training =  0.5084259096281001
Performance Validation =  0.2858455226333767

Average Performance in Training =  0.43948898397622543
Average Performance in Validation =  0.33473104814409843
----------------------------------------------------

M Value =  2
Lambda Value =  0.36

Fold  1
Performance Training =  0.4453976878421595
Performance Validation =  0.259438505237214

Fold  2
Performance Training =  0.41686532611433313
Performance Validation =  0.46825609711703486

Fold  3
Performance Training =  0.3858387583498417
Performance Validation =  0.3226396810693508

Fold  4
Performance Training =  0.5076055522047922
Performance Validation =  0.2859797968850265

Average Performance in Training =  0.43892683112778164
Average Performance in Validation =  0.33407852007715655
----------------------------------------------------

M Value =  2
Lambda Value =  0.37

Fold  1
Performance Training =  0.4450531674168511
Performance Validation =  0.2585843171657519

Fold  2
Performance Training =  0.4165112647650926
Performance Validation =  0.46747105165058644

Fold  3
```

```
Performance Training =  0.385146185220502
Performance Validation =  0.32161782514480386


Fold  4
Performance Training =  0.5068069938292065
Performance Validation =  0.2861055811788451


Average Performance in Training =  0.43837901113330013
Average Performance in Validation =  0.33344469378499686
------------------------------------------------------


M Value =  2
Lambda Value =  0.38


Fold  1
Performance Training =  0.44471617339108205
Performance Validation =  0.25777612735308253


Fold  2
Performance Training =  0.4161652629361068
Performance Validation =  0.4667100406774013


Fold  3
Performance Training =  0.38446878800569106
Performance Validation =  0.3206049539224577


Fold  4
Performance Training =  0.5060292751803677
Performance Validation =  0.28622355994728144


Average Performance in Training =  0.4378448748783119
Average Performance in Validation =  0.3328286704750557
------------------------------------------------------


M Value =  2
Lambda Value =  0.39


Fold  1
Performance Training =  0.4443863365248386
Performance Validation =  0.2570114261269185


Fold  2
Performance Training =  0.41582691960731466
Performance Validation =  0.4659717902144025


Fold  3
Performance Training =  0.38381048340176127
Performance Validation =  0.3196008410902944


Fold  4
Performance Training =  0.505271484226326
Performance Validation =  0.2863343477932122


Average Performance in Training =  0.4373238059400601
Average Performance in Validation =  0.33222960130620693
------------------------------------------------------
```

```
M Value =  2
Lambda Value =  0.4

Fold  1
Performance Training =  0.4440633071133492
Performance Validation =  0.25628786856447483

Fold  2
Performance Training =  0.4154958557417818
Performance Validation =  0.4652551102373186

Fold  3
Performance Training =  0.3831689592470183
Performance Validation =  0.3186052612818906

Fold  4
Performance Training =  0.5045327540965447
Performance Validation =  0.28643849759356854

Average Performance in Training =  0.4368152190496735
Average Performance in Validation =  0.3316466844193131
------------------------------------------------------

M Value =  2
Lambda Value =  0.41000000000000003

Fold  1
Performance Training =  0.4437467539575356
Performance Validation =  0.25560326153761237

Fold  2
Performance Training =  0.41517171304167366
Performance Validation =  0.4645588880488508

Fold  3
Performance Training =  0.38254350631529455
Performance Validation =  0.3176179913360303

Fold  4
Performance Training =  0.5038122609543222
Performance Validation =  0.2865365075504004

Average Performance in Training =  0.43631855856720647
Average Performance in Validation =  0.3310791621182234
------------------------------------------------------

M Value =  2
Lambda Value =  0.42

Fold  1
Performance Training =  0.4434363633666726
Performance Validation =  0.2549555519345128

Fold  2
Performance Training =  0.41485415275692417
```

Performance Validation =  0.46388208225068284


Fold  3
Performance Training =  0.3819334499251612
Performance Validation =  0.31663881128660365


Fold  4
Performance Training =  0.5031092218966006
Performance Validation =  0.28662882734075845


Average Performance in Training =  0.43583329698633966
Average Performance in Validation =  0.33052631820313944
----------------------------------------------------

M Value =  2
Lambda Value =  0.43

Fold  1
Performance Training =  0.44313183819858937
Performance Validation =  0.2543428159385749


Fold  2
Performance Training =  0.41454285454990447
Performance Validation =  0.46322371725812816


Fold  3
Performance Training =  0.3813381482733085
Performance Validation =  0.31566750513138797


Fold  4
Performance Training =  0.5024228929010386
Performance Validation =  0.28671586349290723


Average Performance in Training =  0.4353589334807102
Average Performance in Validation =  0.3299874754552496
----------------------------------------------------

M Value =  2
Lambda Value =  0.44

Fold  1
Performance Training =  0.442832896940774
Performance Validation =  0.2537632492582944


Fold  2
Performance Training =  0.4142375154176159
Performance Validation =  0.4625828783028769


Fold  3
Performance Training =  0.3807569908077594
Performance Validation =  0.31470386141958007


Fold  4
Performance Training =  0.5017525668344656
Performance Validation =  0.28679798409661206

```
Average Performance in Training =  0.4348949925001537
Average Performance in Validation =  0.3294619932693409
------------------------------------------------------

M Value =  2
Lambda Value =  0.45

Fold  1
Performance Training =  0.4425392728342471
Performance Validation =  0.2532151582134965

Fold  2
Performance Training =  0.41393784867161665
Performance Validation =  0.4619587068752554

Fold  3
Performance Training =  0.380189396650921
Performance Validation =  0.31374767369085876

Fold  4
Performance Training =  0.5010975715323809
Performance Validation =  0.2868755229387936

Average Performance in Training =  0.4344410224222914
Average Performance in Validation =  0.32894926542960107
------------------------------------------------------

M Value =  2
Lambda Value =  0.46

Fold  1
Performance Training =  0.44225071304095376
Performance Validation =  0.2526969515935644

Fold  2
Performance Training =  0.4136435829749284
Performance Validation =  0.461350396562631

Fold  3
Performance Training =  0.3796348130793077
Performance Validation =  0.31279874079301484

Fold  4
Performance Training =  0.5004572679557311
Performance Validation =  0.28694878314212857

Average Performance in Training =  0.43399659426273024
Average Performance in Validation =  0.3284487180228347
------------------------------------------------------

M Value =  2
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.4419669778545968
Performance Validation =  0.2522071332123673
```

Fold  2
Performance Training =  0.4133544614345006
Performance Validation =  0.4607571892452845

Fold  3
Performance Training =  0.37909271406432077
Performance Validation =  0.31185686710040517

Fold  4
Performance Training =  0.4998310484285847
Performance Validation =  0.2870180403726974

Average Performance in Training =  0.4335613004455007
Average Performance in Validation =  0.3279598074826886
----------------------------------------------------

M Value =  2
Lambda Value =  0.48

Fold  1
Performance Training =  0.4416878399542269
Performance Validation =  0.25174429509267515

Fold  2
Performance Training =  0.4130702407473422
Performance Validation =  0.4601783716151818

Fold  3
Performance Training =  0.3785625988765827
Performance Validation =  0.31092186265165167

Fold  4
Performance Training =  0.4992183349583196
Performance Validation =  0.287083545673136

Average Performance in Training =  0.4331347536341179
Average Performance in Validation =  0.3274820187581612
----------------------------------------------------

M Value =  2
Lambda Value =  0.49

Fold  1
Performance Training =  0.4414130836994694
Performance Validation =  0.251307111219932

Fold  2
Performance Training =  0.412790690398111
Performance Validation =  0.4596132719867474

Fold  3
Performance Training =  0.3780439907548828
Performance Validation =  0.3099935432217652

Fold  4

```
Performance Training =  0.49861857763845086
Performance Validation =  0.287145527969657

Average Performance in Training =  0.4327165856227285
Average Performance in Validation =  0.32701486359952536
----------------------------------------------------

M Value =  2
Lambda Value =  0.5

Fold  1
Performance Training =  0.4411425044659728
Performance Validation =  0.25089433181162424

Fold  2
Performance Training =  0.4125155919057738
Performance Validation =  0.459061257371984

Fold  3
Performance Training =  0.3775364356397126
Performance Validation =  0.30907173034127866

Fold  4
Performance Training =  0.4980312531330955
Performance Validation =  0.2872041962944447

Average Performance in Training =  0.4323064462861387
Average Performance in Validation =  0.3265578789548329
----------------------------------------------------

M Value =  2
Lambda Value =  0.51

Fold  1
Performance Training =  0.4408759080194564
Performance Validation =  0.2505047780540418

Fold  2
Performance Training =  0.41224473811684503
Performance Validation =  0.45852173079516934

Fold  3
Performance Training =  0.3770395009705432
Performance Validation =  0.3081562512727801

Fold  4
Performance Training =  0.49745586324126434
Performance Validation =  0.28725974175915137

Average Performance in Training =  0.4319040025870272
Average Performance in Validation =  0.32611062547028563
----------------------------------------------------

M Value =  2
Lambda Value =  0.52
```

```
Fold  1
Performance Training =  0.4406131099266173
Performance Validation =  0.2501373372632427

Fold  2
Performance Training =  0.41197793254267534
Performance Validation =  0.45799412882491497

Fold  3
Performance Training =  0.3765527745454137
Performance Validation =  0.30724693895345523

Fold  4
Performance Training =  0.4968919335385775
Performance Validation =  0.2873123393103032

Average Performance in Training =  0.43150893763832093
Average Performance in Validation =  0.325672686087979
------------------------------------------------------

M Value =  2
Lambda Value =  0.53

Fold  1
Performance Training =  0.4403539350010842
Performance Validation =  0.2497909584314164

Fold  2
Performance Training =  0.4117149887382868
Performance Validation =  0.4574779193036532

Fold  3
Performance Training =  0.37607586344096067
Performance Validation =  0.306343631910741

Fold  4
Performance Training =  0.4963390120936043
Performance Validation =  0.2873621492932409

Average Performance in Training =  0.43112094981848403
Average Performance in Validation =  0.32524366473476285
------------------------------------------------------

M Value =  2
Lambda Value =  0.54

Fold  1
Performance Training =  0.4400982167825961
Performance Validation =  0.24946464812380031

Fold  2
Performance Training =  0.41145572972029587
Performance Validation =  0.4569725992566366

Fold  3
Performance Training =  0.3756083929907291
```

```
Performance Validation =  0.30544617415698805


Fold  4
Performance Training =  0.49579666825576163
Performance Validation =  0.2874093188476702

Average Performance in Training =  0.4307397519373457
Average Performance in Validation =  0.32482318509627384
------------------------------------------------------

M Value =  2
Lambda Value =  0.55

Fold  1
Performance Training =  0.4398457970475794
Performance Validation =  0.24915746669478323

Fold  2
Performance Training =  0.41119998742153896
Performance Validation =  0.45647769296432905

Fold  3
Performance Training =  0.37515000581940816
Performance Validation =  0.30455441506798064

Fold  4
Performance Training =  0.4952644915115496
Performance Validation =  0.2874539831548376

Average Performance in Training =  0.43036507045001904
Average Performance in Validation =  0.3244108894704827
------------------------------------------------------

M Value =  2
Lambda Value =  0.56

Fold  1
Performance Training =  0.43959652534934957
Performance Validation =  0.24886852479495292

Fold  2
Performance Training =  0.4109476021801204
Performance Validation =  0.4559927501836961

Fold  3
Performance Training =  0.37470036093051573
Performance Validation =  0.30366820924933113

Fold  4
Performance Training =  0.49474209040583483
Performance Validation =  0.2874962665537507

Average Performance in Training =  0.42999664471645516
Average Performance in Validation =  0.3240064376954327
------------------------------------------------------
```

```
M Value =  2
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.43935025858620036
Performance Validation =  0.24859698014362197

Fold  2
Performance Training =  0.41069842226069053
Performance Validation =  0.45551734450529313

Fold  3
Performance Training =  0.3742591328450141
Performance Validation =  0.3027874163940494

Fold  4
Performance Training =  0.4942290915248754
Performance Validation =  0.28753628354161476

Average Performance in Training =  0.4296342263041951
Average Performance in Validation =  0.3236095061461448
----------------------------------------------------

M Value =  2
Lambda Value =  0.58

Fold  1
Performance Training =  0.43910686059571225
Performance Validation =  0.24834203454384807

Fold  2
Performance Training =  0.4104523034058847
Performance Validation =  0.45505107183436777

Fold  3
Performance Training =  0.3738260107883121
Performance Validation =  0.30191190113398303

Fold  4
Performance Training =  0.4937251385378262
Performance Validation =  0.2875741396717397

Average Performance in Training =  0.4292775783319338
Average Performance in Validation =  0.3232197867959846
----------------------------------------------------

M Value =  2
Lambda Value =  0.59

Fold  1
Performance Training =  0.4388662017736913
Performance Validation =  0.24810293111918147

Fold  2
Performance Training =  0.4102091084159539
Performance Validation =  0.45459354898530513
```

```
Fold  3
Performance Training =  0.37340069792315433
Performance Validation =  0.30104153288739255


Fold  4
Performance Training =  0.49322989129352524
Performance Validation =  0.2876099323605025


Average Performance in Training =  0.4289264748515812
Average Performance in Validation =  0.32283698633809543
-------------------------------------------------------

M Value =  2
Lambda Value =  0.6

Fold  1
Performance Training =  0.4386281587162073
Performance Validation =  0.2478789517533524


Fold  2
Performance Training =  0.4099687067547485
Performance Validation =  0.454144412379783


Fold  3
Performance Training =  0.37298291062593636
Performance Validation =  0.30017618570443494


Fold  4
Performance Training =  0.4927430249694672
Performance Validation =  0.28764375161352074


Average Performance in Training =  0.4285807002665899
Average Performance in Validation =  0.32246082536277276
-------------------------------------------------------

M Value =  2
Lambda Value =  0.61

Fold  1
Performance Training =  0.4383926138832983
Performance Validation =  0.24766941471589


Fold  2
Performance Training =  0.40973097418030147
Performance Validation =  0.4537033168399056


Fold  3
Performance Training =  0.3725723778040634
Performance Validation =  0.29931573811204837


Fold  4
Performance Training =  0.4922642292699748
Performance Validation =  0.2876756806799542


Average Performance in Training =  0.4282400487844095
```

```
Average Performance in Validation =  0.32209103758694957
-----------------------------------------------------


M Value =  2
Lambda Value =  0.62

Fold  1
Performance Training =  0.43815945528296985
Performance Validation =  0.24747367245826302

Fold  2
Performance Training =  0.40949579239839273
Performance Validation =  0.45326993446840946

Fold  3
Performance Training =  0.3721688402520499
Performance Validation =  0.2984600729594379

Fold  4
Performance Training =  0.491793207670707
Performance Validation =  0.2877057966427665

Average Performance in Training =  0.4279043239010299
Average Performance in Validation =  0.3217273691322192
-----------------------------------------------------


M Value =  2
Lambda Value =  0.63

Fold  1
Performance Training =  0.4379285761742081
Performance Validation =  0.247291109566533

Fold  2
Performance Training =  0.4092630487375607
Performance Validation =  0.4528439536087754

Fold  3
Performance Training =  0.3717720500441569
Performance Validation =  0.29760907726510344

Fold  4
Performance Training =  0.49132967670677685
Performance Validation =  0.2877341709518517

Average Performance in Training =  0.42757333791567564
Average Performance in Validation =  0.32136957784806586
-----------------------------------------------------


M Value =  2
Lambda Value =  0.64

Fold  1
Performance Training =  0.43769987478779204
Performance Validation =  0.24712114085784675
```

Fold  2
Performance Training =  0.40903263584413674
Performance Validation =  0.4524250778787252


Fold  3
Performance Training =  0.37138176996145045
Performance Validation =  0.29676264206617375


Fold  4
Performance Training =  0.4908733653018782
Performance Validation =  0.2877608699061157


Average Performance in Training =  0.42724691147381433
Average Performance in Validation =  0.3210174326772154
------------------------------------------------------

M Value =  2
Lambda Value =  0.65

Fold  1
Performance Training =  0.43747325406377047
Performance Validation =  0.24696320960917706


Fold  2
Performance Training =  0.40880445139596555
Performance Validation =  0.4520130252711928


Fold  3
Performance Training =  0.3709977729512768
Performance Validation =  0.29592066227064806


Fold  4
Performance Training =  0.49042401413596326
Performance Validation =  0.28778595508988314


Average Performance in Training =  0.42692487313674404
Average Performance in Validation =  0.32067071306022527
------------------------------------------------------

M Value =  2
Lambda Value =  0.66

Fold  1
Performance Training =  0.43724862140453613
Performance Validation =  0.2468167859078364


Fold  2
Performance Training =  0.40857839783357375
Performance Validation =  0.4516075273173775


Fold  3
Performance Training =  0.37061984161724637
Performance Validation =  0.2950830365129936


Fold  4
Performance Training =  0.48998137504914063

```
Performance Validation =  0.2878094837684

Average Performance in Training =  0.4266070589761242
Average Performance in Validation =  0.3203292083766519
------------------------------------------------------

M Value =  2
Lambda Value =  0.67

Fold  1
Performance Training =  0.43702588844249846
Performance Validation =  0.24668136511415728

Fold  2
Performance Training =  0.40835438210762154
Performance Validation =  0.45120832830698265

Fold  3
Performance Training =  0.37024776773791956
Performance Validation =  0.2942496670134618

Fold  4
Performance Training =  0.4895452104796004
Performance Validation =  0.2878315092466346

Average Performance in Training =  0.42629331219191
Average Performance in Validation =  0.3199927174203091
------------------------------------------------------

M Value =  2
Lambda Value =  0.68

Fold  1
Performance Training =  0.43680497082142056
Performance Validation =  0.24655646642762274

Fold  2
Performance Training =  0.4081323154415647
Performance Validation =  0.45081518456116443

Fold  3
Performance Training =  0.3698813518124857
Performance Validation =  0.29342045944136397

Fold  4
Performance Training =  0.48911529293349265
Performance Validation =  0.2878520811951314

Average Performance in Training =  0.42598348275224085
Average Performance in Validation =  0.31966104790632066
------------------------------------------------------

M Value =  2
Lambda Value =  0.6900000000000001

Fold  1
```

```
Performance Training =  0.43658578799054526
Performance Validation =  0.24644163154846832


Fold  2
Performance Training =  0.40791211310851294
Performance Validation =  0.4504278637541118


Fold  3
Performance Training =  0.36952040263182495
Performance Validation =  0.2925953227824839


Fold  4
Performance Training =  0.4886914044848121
Performance Validation =  0.2878712459462308


Average Performance in Training =  0.4256774270539238
Average Performance in Validation =  0.31933401600782374
----------------------------------------------------


M Value =  2
Lambda Value =  0.7000000000000001


Fold  1
Performance Training =  0.4363682630106934
Performance Validation =  0.24633642342747464


Fold  2
Performance Training =  0.4076936942213585
Performance Validation =  0.4500461442795394


Fold  3
Performance Training =  0.3691647368734361
Performance Validation =  0.29177416921075083


Fold  4
Performance Training =  0.48827333630345937
Performance Validation =  0.28788904676362126


Average Performance in Training =  0.4253750076022368
Average Performance in Validation =  0.3190114459203465
----------------------------------------------------


M Value =  2
Lambda Value =  0.71


Fold  1
Performance Training =  0.43615232237157486
Performance Validation =  0.2462404250972975


Fold  2
Performance Training =  0.40747698153529455
Performance Validation =  0.44966981465867983


Fold  3
Performance Training =  0.3688141787187974
Performance Validation =  0.2909569139642324
```

```
Fold  4
Performance Training =  0.4878608882097595
Performance Validation =  0.2879055240878531

Average Performance in Training =  0.4250760927088566
Average Performance in Validation =  0.3186931694520157
------------------------------------------------------

M Value =  2
Lambda Value =  0.72

Fold  1
Performance Training =  0.4359378958195932
Performance Validation =  0.24615323857923044

Fold  2
Performance Training =  0.4072619012619205
Performance Validation =  0.44929867298666515

Fold  3
Performance Training =  0.36846855949182045
Performance Validation =  0.29014347522545314

Fold  4
Performance Training =  0.48745386825382153
Performance Validation =  0.28792071576016753

Average Performance in Training =  0.4247805562067889
Average Performance in Validation =  0.31837902563787907
------------------------------------------------------

M Value =  2
Lambda Value =  0.73

Fold  1
Performance Training =  0.43572491619548726
Performance Validation =  0.24607448385982422

Fold  2
Performance Training =  0.40704838289417733
Performance Validation =  0.44893252641444403

Fold  3
Performance Training =  0.36812771731712934
Performance Validation =  0.2893337740060381

Fold  4
Performance Training =  0.4870520923182302
Performance Validation =  0.28793465722674116

Average Performance in Training =  0.42448827718125604
Average Performance in Validation =  0.31806886037676185
------------------------------------------------------

M Value =  2
```

```
Lambda Value =  0.74

Fold  1
Performance Training =  0.43551331928118253
Performance Validation =  0.24600379793224503

Fold  2
Performance Training =  0.40683635904140947
Performance Validation =  0.44857119066361917

Fold  3
Performance Training =  0.36779149679698575
Performance Validation =  0.288527734035642

Fold  4
Performance Training =  0.4866553837426506
Performance Validation =  0.2879473817252206

Average Performance in Training =  0.42419913971555706
Average Performance in Validation =  0.3177625260891817
----------------------------------------------------

M Value =  2
Lambda Value =  0.75

Fold  1
Performance Training =  0.43530304365527583
Performance Validation =  0.2459408338976683

Fold  2
Performance Training =  0.40662576527390404
Performance Validation =  0.448214489571806

Fold  3
Performance Training =  0.3674597487057403
Performance Validation =  0.2877252816550767

Fold  4
Performance Training =  0.4862635729690151
Performance Validation =  0.2879589204552331

Average Performance in Training =  0.4239130326509838
Average Performance in Validation =  0.317459881394946
----------------------------------------------------

M Value =  2
Lambda Value =  0.76

Fold  1
Performance Training =  0.435094030556616
Performance Validation =  0.24588526012239686

Fold  2
Performance Training =  0.4064165399762977
Performance Validation =  0.4478622546663096
```

Fold  3
Performance Training =  0.3671323297007699
Performance Validation =  0.28692634571357933

Fold  4
Performance Training =  0.4858764972060531
Performance Validation =  0.2879693027343768

Average Performance in Training =  0.4236298493599342
Average Performance in Validation =  0.31716079080916565
----------------------------------------------------

M Value =  2
Lambda Value =  0.77

Fold  1
Performance Training =  0.4348862237554705
Performance Validation =  0.24583675944674122

Fold  2
Performance Training =  0.4062086242092874
Performance Validation =  0.44751432476410036

Fold  3
Performance Training =  0.36680910204892125
Performance Validation =  0.2861308574701227

Fold  4
Performance Training =  0.48549400011199295
Performance Validation =  0.2879785561410433

Average Performance in Training =  0.42334948753141805
Average Performance in Validation =  0.31686512445550186
----------------------------------------------------

M Value =  2
Lambda Value =  0.78

Fold  1
Performance Training =  0.43467956943181496
Performance Validation =  0.24579502844200873

Fold  2
Performance Training =  0.4060019615791157
Performance Validation =  0.4471705455962207

Fold  3
Performance Training =  0.36648993336753966
Performance Validation =  0.2853387504986282

Fold  4
Performance Training =  0.4851159314943504
Performance Validation =  0.28798670664529014

Average Performance in Training =  0.42307184896820516
Average Performance in Validation =  0.31657275779553695

----------------------------------------------------

M Value =  2
Lambda Value =  0.79

Fold  1
Performance Training =  0.43447401606029634
Performance Validation =  0.24575977671224214

Fold  2
Performance Training =  0.40579649811434404
Performance Validation =  0.44683076945491484

Fold  3
Performance Training =  0.36617469637922684
Performance Validation =  0.2845499605970283

Fold  4
Performance Training =  0.4847421470257781
Performance Validation =  0.2879937787288538

Average Performance in Training =  0.4227968393949113
Average Performance in Validation =  0.3162835713732598
----------------------------------------------------

M Value =  2
Lambda Value =  0.8

Fold  1
Performance Training =  0.4342695143014742
Performance Validation =  0.24573072623761916

Fold  2
Performance Training =  0.40559218214945536
Performance Validation =  0.44649485486190255

Fold  3
Performance Training =  0.36586326867951635
Performance Validation =  0.2837644257000008

Fold  4
Performance Training =  0.4843725079750222
Performance Validation =  0.2879997954952893

Average Performance in Training =  0.42252436827636697
Average Performance in Validation =  0.315997450573703
----------------------------------------------------

M Value =  2
Lambda Value =  0.81

Fold  1
Performance Training =  0.43406601689894353
Performance Validation =  0.2457076107566527

Fold  2

```
Performance Training =  0.4053889642148615
Performance Validation =  0.4461626662563405


Fold  3
Performance Training =  0.365555532516712
Performance Validation =  0.2829820857952906


Fold  4
Performance Training =  0.4840068809520903
Performance Validation =  0.28800477877111863


Average Performance in Training =  0.4222543486456518
Average Performance in Validation =  0.3157142853948506
------------------------------------------------------

M Value =  2
Lambda Value =  0.8200000000000001


Fold  1
Performance Training =  0.4338634785819915
Performance Validation =  0.2456901751845577


Fold  2
Performance Training =  0.40518679693291937
Performance Validation =  0.44583407370113237


Fold  3
Performance Training =  0.36525137458318
Performance Validation =  0.28220288284347916


Fold  4
Performance Training =  0.4836451376667933
Performance Validation =  0.28800874919879604


Average Performance in Training =  0.42198669694122104
Average Performance in Validation =  0.3154339702319913
------------------------------------------------------

M Value =  2
Lambda Value =  0.8300000000000001


Fold  1
Performance Training =  0.43366185597344986
Performance Validation =  0.24567817506535916


Fold  2
Performance Training =  0.40498563491958506
Performance Validation =  0.4455089526063455


Fold  3
Performance Training =  0.36495068581743095
Performance Validation =  0.2814267607010781


Fold  4
Performance Training =  0.4832871546998734
Performance Validation =  0.2880117263222046
```

Average Performance in Training =  0.4217213328525848
Average Performance in Validation =  0.31515640367374687
----------------------------------------------------

M Value =  2
Lambda Value =  0.84

Fold  1
Performance Training =  0.4334611075024337
Performance Validation =  0.24567137605548195

Fold  2
Performance Training =  0.40478543469136385
Performance Validation =  0.44518718346859054

Fold  3
Performance Training =  0.3646533612163654
Performance Validation =  0.2806536650468322

Fold  4
Performance Training =  0.4829328132859878
Performance Validation =  0.2880137286653429

Average Performance in Training =  0.4214581791740377
Average Performance in Validation =  0.31488148830906193
----------------------------------------------------

M Value =  2
Lambda Value =  0.85

Fold  1
Performance Training =  0.43326119332167434
Performance Validation =  0.245669553436756

Fold  2
Performance Training =  0.4045861545772311
Performance Validation =  0.44486865162530864

Fold  3
Performance Training =  0.364359299657102
Performance Validation =  0.27988354331109155

Fold  4
Performance Training =  0.48258199910785504
Performance Validation =  0.2880147738047897

Average Performance in Training =  0.4211971616659656
Average Performance in Validation =  0.31460913054448647
----------------------------------------------------

M Value =  2
Lambda Value =  0.86

Fold  1
Performance Training =  0.43306207522917406

Performance Validation = 0.24567249165689875

Fold  2
Performance Training = 0.40438775463522936
Performance Validation = 0.44455324702298216

Fold  3
Performance Training = 0.36406840372783855
Performance Validation = 0.2791163446081518

Fold  4
Performance Training = 0.4822346021009223
Performance Validation = 0.2880148784364842

Average Performance in Training = 0.4209382089232911
Average Performance in Validation = 0.31433924043112926
-----------------------------------------------------

M Value =  2
Lambda Value =  0.87

Fold  1
Performance Training = 0.4328637165939291
Performance Validation = 0.24567998389570267

Fold  2
Performance Training = 0.4041901965734561
Performance Validation = 0.44424086399836027

Fold  3
Performance Training = 0.3637805795672333
Performance Validation = 0.2783520196714262

Fold  4
Performance Training = 0.48189051626794654
Performance Validation = 0.2880140584373042

Average Performance in Training = 0.42068125225064124
Average Performance in Validation = 0.31407173150069834
-----------------------------------------------------

M Value =  2
Lambda Value =  0.88

Fold  1
Performance Training = 0.43266608228548165
Performance Validation = 0.24569183165527064

Fold  2
Performance Training = 0.4039934436751834
Performance Validation = 0.4439314010718719

Fold  3
Performance Training = 0.3634957367118212
Performance Validation = 0.2775905207913475

```
Fold  4
Performance Training =  0.48154963950292595
Performance Validation =  0.2880123289218861

Average Performance in Training =  0.42042622554385306
Average Performance in Validation =  0.31380652061009406
-----------------------------------------------------

M Value =  2
Lambda Value =  0.89

Fold  1
Performance Training =  0.4324691386070795
Performance Validation =  0.2457078443727686

Fold  2
Performance Training =  0.4037974607278687
Performance Validation =  0.4436247607524272

Fold  3
Performance Training =  0.3632137879510178
Performance Validation =  0.27683180175587396

Fold  4
Performance Training =  0.4812118734238472
Performance Validation =  0.2880097042950823

Average Performance in Training =  0.42017306517745323
Average Performance in Validation =  0.31354352779403805
-----------------------------------------------------

M Value =  2
Lambda Value =  0.9

Fold  1
Performance Training =  0.43227285323223474
Performance Validation =  0.2457278390542682

Fold  2
Performance Training =  0.40360221395581797
Performance Validation =  0.4433208493529043

Fold  3
Performance Training =  0.3629346491892793
Performance Validation =  0.2760758177935052

Fold  4
Performance Training =  0.48087712321375375
Performance Validation =  0.28800619830042296

Average Performance in Training =  0.41992170989777144
Average Performance in Validation =  0.31328267612527516
-----------------------------------------------------

M Value =  2
Lambda Value =  0.91
```

```
Fold  1
Performance Training =  0.4320771951444844
Performance Validation =  0.24575163992836724

Fold  2
Performance Training =  0.4034076709563019
Performance Validation =  0.44301957681563253

Fold  3
Performance Training =  0.3626582393150295
Performance Validation =  0.27532252551867953

Fold  4
Performance Training =  0.4805452974696648
Performance Validation =  0.28800182406491115

Average Performance in Training =  0.4196721007213702
Average Performance in Validation =  0.3130238915818976
----------------------------------------------------

M Value =  2
Lambda Value =  0.92

Fold  1
Performance Training =  0.4318821345801731
Performance Validation =  0.24577907811835276

Fold  2
Performance Training =  0.403213800638914
Performance Validation =  0.4427208565472639

Fold  3
Performance Training =  0.36238448007596924
Performance Validation =  0.2745718828794804

Fold  4
Performance Training =  0.48021630805890947
Performance Validation =  0.28799659414045076

Average Performance in Training =  0.4194241808384914
Average Performance in Validation =  0.312767102921387
----------------------------------------------------

M Value =  2
Lambda Value =  0.93

Fold  1
Performance Training =  0.43168764297408535
Performance Validation =  0.24580999133176673

Fold  2
Performance Training =  0.40302057316798945
Performance Validation =  0.4424246052624413

Fold  3
```

```
Performance Training =  0.36211329596042496
Performance Validation =  0.27382384910752045


Fold  4
Performance Training =  0.47989006998246364
Performance Validation =  0.28799052054218377


Average Performance in Training =  0.41917789552124085
Average Performance in Validation =  0.312251224156097807
------------------------------------------------------

M Value =  2
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.4314936929077662
Performance Validation =  0.24584422356631352


Fold  2
Performance Training =  0.4028279599079073
Performance Validation =  0.44213074283573084


Fold  3
Performance Training =  0.36184461408440105
Performance Validation =  0.27307838466993795


Fold  4
Performance Training =  0.47956650124490086
Performance Validation =  0.28798361478398504


Average Performance in Training =  0.41893319203624385
Average Performance in Validation =  0.31225924146399187
------------------------------------------------------

M Value =  2
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.43130025806037964
Performance Validation =  0.2458816248311203


Fold  2
Performance Training =  0.4026359333711148
Performance Validation =  0.44183919216131307


Fold  3
Performance Training =  0.3615783640840289
Performance Validation =  0.27233545122338676


Fold  4
Performance Training =  0.47924552273060017
Performance Validation =  0.28797588791134343


Average Performance in Training =  0.41869001956153085
Average Performance in Validation =  0.31200803903179086
------------------------------------------------------
```

```
M Value =  2
Lambda Value =  0.96

Fold  1
Performance Training =  0.4311073131619676
Performance Validation =  0.24592205088242602

Fold  2
Performance Training =  0.40244446716871896
Performance Validation =  0.4415498790199668

Fold  3
Performance Training =  0.36131447801311933
Performance Validation =  0.2715950115699599

Fold  4
Performance Training =  0.478927058085864
Performance Validation =  0.287967350531837

Average Performance in Training =  0.41844832910741747
Average Performance in Validation =  0.3117585730010474
------------------------------------------------------

M Value =  2
Lambda Value =  0.97

Fold  1
Performance Training =  0.4309148339489697
Performance Validation =  0.24596536297284144

Fold  2
Performance Training =  0.40225353596350033
Performance Validation =  0.44126273195290966

Fold  3
Performance Training =  0.3610528902455433
Performance Validation =  0.2708570296149313

Fold  4
Performance Training =  0.4786110336066308
Performance Validation =  0.2879580128433925

Average Performance in Training =  0.41820807344116107
Average Performance in Validation =  0.31151078434601875
------------------------------------------------------

M Value =  2
Lambda Value =  0.98

Fold  1
Performance Training =  0.43072279712188755
Performance Validation =  0.24601142761338224

Fold  2
Performance Training =  0.40206311542521644
```

Performance Validation =  0.4409776821420881


Fold  3
Performance Training =  0.36079353738218567
Performance Validation =  0.27012147032626355


Fold  4
Performance Training =  0.478297378131477
Performance Validation =  0.28794788466050425


Average Performance in Training =  0.41796920701519163
Average Performance in Validation =  0.31126461618555956
----------------------------------------------------


M Value =  2
Lambda Value =  0.99


Fold  1
Performance Training =  0.4305311803049703
Performance Validation =  0.24606011634751745


Fold  2
Performance Training =  0.40187318218806845
Performance Validation =  0.4406946632965393


Fold  3
Performance Training =  0.3605363581622263
Performance Validation =  0.2693882996957887


Fold  4
Performance Training =  0.47798602293962944
Performance Validation =  0.28793697543856933


Average Performance in Training =  0.41773168589872356
Average Performance in Validation =  0.3110200136946037
----------------------------------------------------


M Value =  2
Lambda Value =  1.0


Fold  1
Performance Training =  0.4303399620078161
Performance Validation =  0.2461113055365476


Fold  2
Performance Training =  0.40168371381020795
Performance Validation =  0.44041361154446645


Fold  3
Performance Training =  0.3602812933785223
Performance Validation =  0.26865748470198836


Fold  4
Performance Training =  0.47767690165371945
Performance Validation =  0.28792529429648805

```
Average Performance in Training =  0.41749546771256646
Average Performance in Validation =  0.3107769240198726
-------------------------------------------------------

M Value =  2
Lambda Value =  1.01

Fold  1
Performance Training =  0.43014912158878504
Performance Validation =  0.2461648761556502

Fold  2
Performance Training =  0.40149468873517946
Performance Validation =  0.4401344653307062

Fold  3
Performance Training =  0.36002828579687396
Performance Validation =  0.26792899327430286

Fold  4
Performance Training =  0.4773699501470281
Performance Validation =  0.28791285003765854

Average Performance in Training =  0.41726051156696664
Average Performance in Validation =  0.3105352961995794
-------------------------------------------------------

M Value =  2
Lambda Value =  1.02

Fold  1
Performance Training =  0.42995863922012434
Performance Validation =  0.24622071359998754

Fold  2
Performance Training =  0.40130608625518993
Performance Validation =  0.4398571653192661

Fold  3
Performance Training =  0.35977728007897525
Performance Validation =  0.26720279425891524

Fold  4
Performance Training =  0.47706510645498823
Performance Validation =  0.2878996511694947

Average Performance in Training =  0.4170267780023194
Average Performance in Validation =  0.3102950810869159
-------------------------------------------------------

M Value =  2
Lambda Value =  1.03

Fold  1
Performance Training =  0.4297684958547 2077
Performance Validation =  0.24627870750030179
```

```
Fold  2
Performance Training =  0.4011178864761049
Performance Validation =  0.43958165430065466


Fold  3
Performance Training =  0.3595282227088542
Performance Validation =  0.2664788573859175


Fold  4
Performance Training =  0.47676231069071995
Performance Validation =  0.2878857059215738


Average Performance in Training =  0.41679422893259993
Average Performance in Validation =  0.3100562312771119
---------------------------------------------------

M Value =  2
Lambda Value =  1.04


Fold  1
Performance Training =  0.4295786731943866
Performance Validation =  0.24633875154746798


Fold  2
Performance Training =  0.40093007028408345
Performance Validation =  0.43930787710372743


Fold  3
Performance Training =  0.35928106192262454
Performance Validation =  0.265757153237821


Fold  4
Performance Training =  0.47646150496439055
Performance Validation =  0.2878710222625187


Average Performance in Training =  0.41656282759137125
Average Performance in Validation =  0.3098187010378838
---------------------------------------------------

M Value =  2
Lambda Value =  1.05


Fold  1
Performance Training =  0.42938915365960606
Performance Validation =  0.24640074332550255


Fold  2
Performance Training =  0.4007426193137631
Performance Validation =  0.4390357805117948


Fold  3
Performance Training =  0.35903574764138213
Performance Validation =  0.2650376532193516


Fold  4
```

```
Performance Training =  0.476162633306202
Performance Validation =  0.28785560791571285

Average Performance in Training =  0.4163325384802383
Average Performance in Validation =  0.30958244624309045
----------------------------------------------------

M Value =  2
Lambda Value =  1.06

Fold  1
Performance Training =  0.4291999203606611
Performance Validation =  0.24646458415255812

Fold  2
Performance Training =  0.4005555159179126
Performance Validation =  0.4387653131827616

Fold  3
Performance Training =  0.35879223140708083
Performance Validation =  0.26432032952844753

Fold  4
Performance Training =  0.4758656415928212
Performance Validation =  0.28783947037392854

Average Performance in Training =  0.41610332731961897
Average Performance in Validation =  0.30934742430942397
----------------------------------------------------

M Value =  2
Lambda Value =  1.07

Fold  1
Performance Training =  0.4290109570700672
Performance Validation =  0.24653017892946605

Fold  2
Performance Training =  0.40036874313847504
Performance Validation =  0.438496425573066

Fold  3
Performance Training =  0.35855046632124243
Performance Validation =  0.2636051551284416

Fold  4
Performance Training =  0.4755704774770756
Performance Validation =  0.28782261691295685

Average Performance in Training =  0.41587516100171507
Average Performance in Validation =  0.3091135941359826
----------------------------------------------------

M Value =  2
Lambda Value =  1.08
```

Fold  1
Performance Training =  0.4288222481962515
Performance Validation =  0.24659743599541395

Fold  2
Performance Training =  0.400182284678931
Performance Validation =  0.4382290698652187

Fold  3
Performance Training =  0.35831040698635197
Performance Validation =  0.2628921037213482

Fold  4
Performance Training =  0.47527709032075094
Performance Validation =  0.2878050546043045

Average Performance in Training =  0.4156480075455714
Average Performance in Validation =  0.3088809160465713
-------------------------------------------------------

M Value =  2
Lambda Value =  1.09

Fold  1
Performance Training =  0.42863377875840925
Performance Validation =  0.24666626699037575

Fold  2
Performance Training =  0.3999961248779119
Performance Validation =  0.43796319989874066

Fold  3
Performance Training =  0.35807200944981366
Performance Validation =  0.26218114972222106

Fold  4
Performance Training =  0.4749854311303343
Performance Validation =  0.2877867903270329

Average Performance in Training =  0.4154218360541173
Average Performance in Validation =  0.3086493517345926
-------------------------------------------------------

M Value =  3
Lambda Value =  0.01

Fold  1
Performance Training =  0.6310108823408143
Performance Validation =  0.6518488243467199

Fold  2
Performance Training =  0.6150560102841955
Performance Validation =  0.7117516494670075

Fold  3
Performance Training =  0.6021936415074636

Performance Validation =  0.5692212458352904


Fold  4
Performance Training =  0.7023323802366535
Performance Validation =  0.4190598263392419


Average Performance in Training =  0.6376482285922818
Average Performance in Validation =  0.5879703864970649
------------------------------------------------------

M Value =  3
Lambda Value =  0.02

Fold  1
Performance Training =  0.5839080983708491
Performance Validation =  0.5912134939189329


Fold  2
Performance Training =  0.5641815619442295
Performance Validation =  0.6705517057840784


Fold  3
Performance Training =  0.5544285795657939
Performance Validation =  0.5086257905409362


Fold  4
Performance Training =  0.6663787914903532
Performance Validation =  0.3678341117295889


Average Performance in Training =  0.5922242578428065
Average Performance in Validation =  0.5345562754933841
------------------------------------------------------

M Value =  3
Lambda Value =  0.03

Fold  1
Performance Training =  0.5602824120443901
Performance Validation =  0.5558353222243702


Fold  2
Performance Training =  0.5388206179557473
Performance Validation =  0.6475901560254569


Fold  3
Performance Training =  0.530999196452666
Performance Validation =  0.4781391157121031


Fold  4
Performance Training =  0.6477271374080048
Performance Validation =  0.34516148137535196


Average Performance in Training =  0.5694573409652021
Average Performance in Validation =  0.5066815188343206
------------------------------------------------------

```
M Value =  3
Lambda Value =  0.04

Fold  1
Performance Training =  0.546045706827577
Performance Validation =  0.5324144604282456

Fold  2
Performance Training =  0.5235665973766443
Performance Validation =  0.6326419984880759

Fold  3
Performance Training =  0.5169558549225863
Performance Validation =  0.45958120264983393

Fold  4
Performance Training =  0.6361629256571109
Performance Validation =  0.33298397553006753

Average Performance in Training =  0.5556827711959796
Average Performance in Validation =  0.48940540927405574
------------------------------------------------------

M Value =  3
Lambda Value =  0.05

Fold  1
Performance Training =  0.5364152300082612
Performance Validation =  0.5152487096674517

Fold  2
Performance Training =  0.5132472736501232
Performance Validation =  0.6217735486330435

Fold  3
Performance Training =  0.5074250964280576
Performance Validation =  0.44684538332424517

Fold  4
Performance Training =  0.6280965639440708
Performance Validation =  0.3257242811364325

Average Performance in Training =  0.5462960410076282
Average Performance in Validation =  0.4773979806902932
------------------------------------------------------

M Value =  3
Lambda Value =  0.06

Fold  1
Performance Training =  0.529364720481363
Performance Validation =  0.5017293753466842

Fold  2
Performance Training =  0.505683900829133
Performance Validation =  0.6132469492659165
```

Fold  3
Performance Training =  0.500384329897423
Performance Validation =  0.43736386502538493

Fold  4
Performance Training =  0.6219852961303135
Performance Validation =  0.32111096488062285

Average Performance in Training =  0.5393545618345581
Average Performance in Validation =  0.4683627886296522
------------------------------------------------------

M Value =  3
Lambda Value =  0.07

Fold  1
Performance Training =  0.5238964372024077
Performance Validation =  0.49052075434398357

Fold  2
Performance Training =  0.499807691253098
Performance Validation =  0.6061884463929853

Fold  3
Performance Training =  0.49485113432188177
Performance Validation =  0.4298779772308846

Fold  4
Performance Training =  0.6170651666109718
Performance Validation =  0.31805284721818905

Average Performance in Training =  0.5339051073470898
Average Performance in Validation =  0.46116000629651066
------------------------------------------------------

M Value =  3
Lambda Value =  0.08

Fold  1
Performance Training =  0.5194647904653705
Performance Validation =  0.4808746393278822

Fold  2
Performance Training =  0.49503585776239534
Performance Validation =  0.6001142686423984

Fold  3
Performance Training =  0.49029402914147535
Performance Validation =  0.4237012028252235

Fold  4
Performance Training =  0.61291831569754
Performance Validation =  0.31596498077943436

Average Performance in Training =  0.5294282482666952

Average Performance in Validation =  0.45516377289373455
-------------------------------------------------------

M Value =  3
Lambda Value =  0.09

Fold  1
Performance Training =  0.5157476262636443
Performance Validation =  0.4723416922619663

Fold  2
Performance Training =  0.49102506803470314
Performance Validation =  0.594736317032786

Fold  3
Performance Training =  0.48640216418831284
Performance Validation =  0.41842864747216746

Fold  4
Performance Training =  0.6092989362328027
Performance Validation =  0.31450845618992573

Average Performance in Training =  0.5256184486798657
Average Performance in Validation =  0.45000377823921134
-------------------------------------------------------

M Value =  3
Lambda Value =  0.1

Fold  1
Performance Training =  0.5125432441019391
Performance Validation =  0.4646368035028049

Fold  2
Performance Training =  0.4875607706955364
Performance Validation =  0.5898729858854359

Fold  3
Performance Training =  0.4829826983266011
Performance Validation =  0.4138068446951546

Fold  4
Performance Training =  0.6060542194629053
Performance Validation =  0.3134753001259819

Average Performance in Training =  0.5222852331467456
Average Performance in Validation =  0.4454479835523444
-------------------------------------------------------

M Value =  3
Lambda Value =  0.11

Fold  1
Performance Training =  0.5097193889075845
Performance Validation =  0.4575708193698137

```
Fold  2
Performance Training =  0.48450250716739895
Performance Validation =  0.5854044421119666


Fold  3
Performance Training =  0.4799103668515259
Performance Validation =  0.40966949265229313


Fold  4
Performance Training =  0.6030849725881492
Performance Validation =  0.3127321797541429


Average Performance in Training =  0.5193043088786646
Average Performance in Validation =  0.44134423347205415
------------------------------------------------------

M Value =  3
Lambda Value =  0.12


Fold  1
Performance Training =  0.5071860348643131
Performance Validation =  0.45101350720599753


Fold  2
Performance Training =  0.48175478982588393
Performance Validation =  0.5812485642714568


Fold  3
Performance Training =  0.4771007402951608
Performance Validation =  0.4059032518164024


Fold  4
Performance Training =  0.60032453007306
Performance Validation =  0.3121906589265808


Average Performance in Training =  0.5165915237646044
Average Performance in Validation =  0.4375889955551094
------------------------------------------------------

M Value =  3
Lambda Value =  0.13


Fold  1
Performance Training =  0.5048799716258742
Performance Validation =  0.44487232593802006


Fold  2
Performance Training =  0.4792506379371756
Performance Validation =  0.5773472384848035


Fold  3
Performance Training =  0.4744951595875935
Performance Validation =  0.4024284089181307


Fold  4
Performance Training =  0.597726788236663
```

Performance Validation =  0.3117904911354633

Average Performance in Training =  0.5140881393468266
Average Performance in Validation =  0.43410961611910437
-------------------------------------------------------

M Value =  3
Lambda Value =  0.14

Fold  1
Performance Training =  0.5027556380237068
Performance Validation =  0.43907968703103095

Fold  2
Performance Training =  0.47694180270361364
Performance Validation =  0.5736581782411128

Fold  3
Performance Training =  0.47205181947536246
Performance Validation =  0.39918739147468163

Fold  4
Performance Training =  0.5952590876271915
Performance Validation =  0.31148975759884656

Average Performance in Training =  0.5117520869574685
Average Performance in Validation =  0.430853753586418
-------------------------------------------------------

M Value =  3
Lambda Value =  0.15

Fold  1
Performance Training =  0.5007794447407947
Performance Validation =  0.43358501048491493

Fold  2
Performance Training =  0.4747927223268421
Performance Validation =  0.5701498459964438

Fold  3
Performance Training =  0.46974027025112564
Performance Validation =  0.3961376585738011

Fold  4
Performance Training =  0.5928978097053941
Performance Validation =  0.31125880241803483

Average Performance in Training =  0.5095525617560391
Average Performance in Validation =  0.4277828293682987
-------------------------------------------------------

M Value =  3
Lambda Value =  0.16

Fold  1

```
Performance Training =   0.4989261349211833
Performance Validation =   0.42834960614774487


Fold  2
Performance Training =   0.472776652790703
Performance Validation =   0.5667981936538511


Fold  3
Performance Training =   0.46753790840266374
Performance Validation =   0.3932471444318486


Fold  4
Performance Training =   0.5906255613931928
Performance Validation =   0.31107637268066624


Average Performance in Training =   0.5074665643769357
Average Performance in Validation =   0.4248678292285277
------------------------------------------------------

M Value =   3
Lambda Value =   0.17


Fold  1
Performance Training =   0.49717638149130383
Performance Validation =   0.423343281264143


Fold  2
Performance Training =   0.47087311722112746
Performance Validation =   0.5635845097852574


Fold  3
Performance Training =   0.46542766998403196
Performance Validation =   0.39049124964639326


Fold  4
Performance Training =   0.5884293237245604
Performance Validation =   0.310927089495143


Average Performance in Training =   0.5054766231052559
Average Performance in Validation =   0.42208653254773415
------------------------------------------------------

M Value =   3
Lambda Value =   0.18


Fold  1
Performance Training =   0.49551516003935925
Performance Validation =   0.4185420363340414


Fold  2
Performance Training =   0.469066181071659
Performance Validation =   0.5604939620713976


Fold  3
Performance Training =   0.4633964757382606
Performance Validation =   0.38785080247785264
```

```
Fold  4
Performance Training =  0.5862992048432147
Performance Validation =  0.31079974942830746

Average Performance in Training =  0.5035692554231234
Average Performance in Validation =  0.4194216375778998
-----------------------------------------------------

M Value =  3
Lambda Value =  0.19

Fold  1
Performance Training =  0.4939306221411096
Performance Validation =  0.41392646612199

Fold  2
Performance Training =  0.467343259505997
Performance Validation =  0.5575145887253351

Fold  3
Performance Training =  0.4614341597479765
Performance Validation =  0.3853106459160581

Fold  4
Performance Training =  0.5842275824359267
Performance Validation =  0.31068615907536024

Average Performance in Training =  0.5017339059577524
Average Performance in Validation =  0.4168594649596859
-----------------------------------------------------

M Value =  3
Lambda Value =  0.2

Fold  1
Performance Training =  0.49241329979109694
Performance Validation =  0.4094806286694811

Fold  2
Performance Training =  0.46569427643861205
Performance Validation =  0.5546365870133738

Fold  3
Performance Training =  0.4595327169690897
Performance Validation =  0.38285863880602244

Fold  4
Performance Training =  0.5822085032256119
Performance Validation =  0.3105803205301002

Average Performance in Training =  0.4999621991061026
Average Performance in Validation =  0.4143890437547444
-----------------------------------------------------

M Value =  3
```

Lambda Value =  0.21

Fold  1
Performance Training =  0.4909555337937649
Performance Validation =  0.40519123159647497

Fold  2
Performance Training =  0.46411106112802336
Performance Validation =  0.5518518026400345

Fold  3
Performance Training =  0.4576857657435105
Performance Validation =  0.3804849371398813

Fold  4
Performance Training =  0.5802372557652107
Performance Validation =  0.310477852901365

Average Performance in Training =  0.49824740410762736
Average Performance in Validation =  0.41200145606943894
-----------------------------------------------------

M Value =  3
Lambda Value =  0.22

Fold  1
Performance Training =  0.4895510566461512
Performance Validation =  0.40104703763071803

Fold  2
Performance Training =  0.4625869084236057
Performance Validation =  0.5491533575588599

Fold  3
Performance Training =  0.45588815809262717
Performance Validation =  0.3781814687289824

Fold  4
Performance Training =  0.5783100622613916
Performance Validation =  0.310375575692707

Average Performance in Training =  0.4965840463559439
Average Performance in Validation =  0.40968935990281685
-----------------------------------------------------

M Value =  3
Lambda Value =  0.23

Fold  1
Performance Training =  0.4881946838805823
Performance Validation =  0.39703842420741375

Fold  2
Performance Training =  0.4611162537531185
Performance Validation =  0.5465353748297895

Fold  3
Performance Training =  0.4541356933741354
Performance Validation =  0.37594154375172684

Fold  4
Performance Training =  0.5764238535137937
Performance Validation =  0.31027120507816963

Average Performance in Training =  0.4949676211304075
Average Performance in Validation =  0.40744663696677497
----------------------------------------------------

M Value =  3
Lambda Value =  0.24

Fold  1
Performance Training =  0.48688208276391776
Performance Validation =  0.3931570530204751

Fold  2
Performance Training =  0.4596944298383592
Performance Validation =  0.5439927725736355

Fold  3
Performance Training =  0.45242490536446367
Performance Validation =  0.37375956231460994

Fold  4
Performance Training =  0.5745761027512426
Performance Validation =  0.310163130118293

Average Performance in Training =  0.4933943801794958
Average Performance in Validation =  0.4052681295067534
----------------------------------------------------

M Value =  3
Lambda Value =  0.25

Fold  1
Performance Training =  0.48560959696333905
Performance Validation =  0.3893956191391392

Fold  2
Performance Training =  0.45831748246238035
Performance Validation =  0.5415211078186712

Fold  3
Performance Training =  0.4507529022315262
Performance Validation =  0.37163079229020524

Fold  4
Performance Training =  0.5727647017550914
Performance Validation =  0.3100502463472742

Average Performance in Training =  0.4918611708530843
Average Performance in Validation =  0.4031494413988225

---------------------------------------------------

M Value =  3
Lambda Value =  0.26

Fold  1
Performance Training =  0.48437411223202365
Performance Validation =  0.3857476584362104

Fold  2
Performance Training =  0.45698202946144273
Performance Validation =  0.5391164568362798

Fold  3
Performance Training =  0.4491172450873032
Performance Validation =  0.3695511987386123

Fold  4
Performance Training =  0.5709878677036173
Performance Validation =  0.3099318310315514

Average Performance in Training =  0.49036531362109675
Average Performance in Validation =  0.4010867862606635
---------------------------------------------------

M Value =  3
Lambda Value =  0.27

Fold  1
Performance Training =  0.4831729525177537
Performance Validation =  0.38220739825146965

Fold  2
Performance Training =  0.4556851517342789
Performance Validation =  0.5367753224784086

Fold  3
Performance Training =  0.4475158550035534
Performance Validation =  0.36751731164886414

Fold  4
Performance Training =  0.5692440725722505
Performance Validation =  0.30980744902325785

Average Performance in Training =  0.4889045079569591
Average Performance in Validation =  0.3990768703505001
---------------------------------------------------

M Value =  3
Lambda Value =  0.28

Fold  1
Performance Training =  0.4820037988810967
Performance Validation =  0.3787696404573193

Fold  2

```
Performance Training =  0.4544243082266003
Performance Validation =  0.5344945617139583


Fold  3
Performance Training =  0.44594694124488743
Performance Validation =  0.3655261224619558


Fold  4
Performance Training =  0.5675319892531763
Performance Validation =  0.3096768812931894


Average Performance in Training =  0.48747675940144014
Average Performance in Validation =  0.3971168014816057
------------------------------------------------------

M Value =  3
Lambda Value =  0.29


Fold  1
Performance Training =  0.48086462568646926
Performance Validation =  0.3754296690504161


Fold  2
Performance Training =  0.45319726904965096
Performance Validation =  0.5322713284277792


Fold  3
Performance Training =  0.44440894546752496
Performance Validation =  0.36357500243130214


Fold  4
Performance Training =  0.5658504501750856
Performance Validation =  0.3095400704209341


Average Performance in Training =  0.4860803225946827
Average Performance in Validation =  0.3952040175826079
------------------------------------------------------

M Value =  3
Lambda Value =  0.3


Fold  1
Performance Training =  0.47975364999437753
Performance Validation =  0.37218317648020105


Fold  2
Performance Training =  0.4520020624425145
Performance Validation =  0.5301030278609218


Fold  3
Performance Training =  0.4429004980357375
Performance Validation =  0.361661637707165


Fold  4
Performance Training =  0.5641984153414704
Performance Validation =  0.3093970788613887
```

```
Average Performance in Training =  0.48471365645352493
Average Performance in Validation =  0.39333623022741915
----------------------------------------------------

M Value =  3
Lambda Value =  0.31

Fold  1
Performance Training =  0.47866929112942014
Performance Validation =  0.36902620441624456

Fold  2
Performance Training =  0.4508369323943431
Performance Validation =  0.5279872800084867

Fold  3
Performance Training =  0.4414203836082059
Performance Validation =  0.3597839773402892

Fold  4
Performance Training =  0.5625749475155917
Performance Validation =  0.3092480569037155

Average Performance in Training =  0.48337538866189017
Average Performance in Validation =  0.391511379667184
----------------------------------------------------

M Value =  3
Lambda Value =  0.32

Fold  1
Performance Training =  0.4776101381545287
Performance Validation =  0.36595509573342866

Fold  2
Performance Training =  0.44970030454108567
Performance Validation =  0.5259218899673965

Fold  3
Performance Training =  0.439967513867323
Performance Validation =  0.35794019134607

Fold  4
Performance Training =  0.5609791928628263
Performance Validation =  0.30909321802789647

Average Performance in Training =  0.4820642873564409
Average Performance in Validation =  0.3897275987686979
----------------------------------------------------

M Value =  3
Lambda Value =  0.33

Fold  1
Performance Training =  0.47657492353379116
```

```
Performance Validation =  0.3629664552800568


Fold  2
Performance Training =  0.4485907585335789
Performance Validation =  0.5239048237190187


Fold  3
Performance Training =  0.4385409057893751
Performance Validation =  0.3561286366620251


Fold  4
Performance Training =  0.5594103657844478
Performance Validation =  0.30893281993756805


Average Performance in Training =  0.48077923841029824
Average Performance in Validation =  0.38798318389966713
------------------------------------------------------

M Value =  3
Lambda Value =  0.34

Fold  1
Performance Training =  0.4755625016731194
Performance Validation =  0.3600571175732147


Fold  2
Performance Training =  0.447507005502668
Performance Validation =  0.5219341881937538


Fold  3
Performance Training =  0.4371396642394144
Performance Validation =  0.3543478293418736


Fold  4
Performance Training =  0.5578677369873375
Performance Validation =  0.30876714996862353


Average Performance in Training =  0.4795192271006348
Average Performance in Validation =  0.3862765712693664
------------------------------------------------------

M Value =  3
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.4745718313308104
Performance Validation =  0.35722411999627457


Fold  2
Performance Training =  0.44644786956573546
Performance Validation =  0.5200082147336027


Fold  3
Performance Training =  0.4357629679609154
Performance Validation =  0.35259642170961925
```

```
Fold  4
Performance Training =  0.5563506240637217
Performance Validation =  0.30859651388445775

Average Performance in Training =  0.47828332323029576
Average Performance in Validation =  0.38460631758098857
------------------------------------------------------

M Value =  3
Lambda Value =  0.36

Fold  1
Performance Training =  0.4736019611172836
Performance Validation =  0.3544646803962319

Fold  2
Performance Training =  0.4454122725579208
Performance Validation =  0.5181252452698804

Fold  3
Performance Training =  0.43441005824440937
Performance Validation =  0.35087318348302154

Fold  4
Performance Training =  0.5548583840261212
Performance Validation =  0.30842122730105526

Average Performance in Training =  0.47707066898643374
Average Performance in Validation =  0.3829710841125473
------------------------------------------------------

M Value =  3
Lambda Value =  0.37

Fold  1
Performance Training =  0.4726520174751989
Performance Validation =  0.3517761782224287

Fold  2
Performance Training =  0.44439922135182697
Performance Validation =  0.5162837206850255

Fold  3
Performance Training =  0.43308022972067606
Performance Validation =  0.34917698609219516

Fold  4
Performance Training =  0.55339040737117
Performance Validation =  0.3082416091597049

Average Performance in Training =  0.475880468979718
Average Performance in Validation =  0.38136962353983855
------------------------------------------------------

M Value =  3
Lambda Value =  0.38
```

```
Fold  1
Performance Training =  0.47172119466217477
Performance Validation =  0.3491561385337836

Fold  2
Performance Training =  0.4434077972669358
Performance Validation =  0.5144821709427577

Fold  3
Performance Training =  0.4317728228465836
Performance Validation =  0.34750678958444714

Fold  4
Performance Training =  0.5519461133430097
Performance Validation =  0.30805797679722025

Average Performance in Training =  0.47471198202967596
Average Performance in Validation =  0.37980076896455217
--------------------------------------------------

M Value =  3
Lambda Value =  0.39

Fold  1
Performance Training =  0.4708087463589147
Performance Validation =  0.34660221834387295

Fold  2
Performance Training =  0.4424371471753187
Performance Validation =  0.5127192066590485

Fold  3
Performance Training =  0.4304872177452972
Performance Validation =  0.34586163163356975

Fold  4
Performance Training =  0.5505249461407764
Performance Validation =  0.30787064226414484

Average Performance in Training =  0.47356451435507674
Average Performance in Validation =  0.378263424725159
--------------------------------------------------

M Value =  3
Lambda Value =  0.4

Fold  1
Performance Training =  0.4699139786032476
Performance Validation =  0.34411219488289335

Fold  2
Performance Training =  0.441486475991533
Performance Validation =  0.5109935118543434

Fold  3
```

```
Performance Training = 0.4292228291345742
Performance Validation = 0.34424061827013486


Fold  4
Performance Training = 0.5491263718711261
Performance Validation = 0.3076799096184556


Average Performance in Training =  0.47243741390012023
Average Performance in Validation =  0.37675655865645674
------------------------------------------------------

M Value =  3
Lambda Value =  0.41000000000000003

Fold  1
Performance Training = 0.4690362438110288
Performance Validation = 0.3416839554406622


Fold  2
Performance Training = 0.4405550402977618
Performance Validation = 0.5093038376801258


Fold  3
Performance Training = 0.4279791021325672
Performance Validation = 0.34264291602597297


Fold  4
Performance Training = 0.5477498760901232
Performance Validation = 0.30748607298159825


Average Performance in Training =  0.4713300655828703
Average Performance in Validation =  0.3752791955320898
------------------------------------------------------

M Value =  3
Lambda Value =  0.42

Fold  1
Performance Training = 0.4681749356920871
Performance Validation = 0.3393154885212535


Fold  2
Performance Training = 0.43964214290457604
Performance Validation = 0.5076489969539656


Fold  3
Performance Training = 0.42675550877386015
Performance Validation = 0.34106774524613215


Fold  4
Performance Training = 0.5463949618123378
Performance Validation = 0.3072894151895955


Average Performance in Training =  0.4702418872957153
Average Performance in Validation =  0.37383041147773666
------------------------------------------------------
```

M Value =  3
Lambda Value =  0.43

Fold  1
Performance Training =  0.46732948490658455
Performance Validation =  0.3370048760920562

Fold  2
Performance Training =  0.43874712818647044
Performance Validation =  0.5060278593693937

Fold  3
Performance Training =  0.4255515451023355
Performance Validation =  0.3395143743688491

Fold  4
Performance Training =  0.5450611478909784
Performance Validation =  0.30709020690764754

Average Performance in Training =  0.4691723265215922
Average Performance in Validation =  0.37240932918448666
----------------------------------------------------

M Value =  3
Lambda Value =  0.44

Fold  1
Performance Training =  0.46649935533652975
Performance Validation =  0.33475028675115714

Fold  2
Performance Training =  0.4378693780619344
Performance Validation =  0.5044393472723102

Fold  3
Performance Training =  0.4243667287340621
Performance Validation =  0.3379821150116348

Fold  4
Performance Training =  0.5437479676931565
Performance Validation =  0.30688870610450136

Average Performance in Training =  0.4681208574564207
Average Performance in Validation =  0.3710151137849009
----------------------------------------------------

M Value =  3
Lambda Value =  0.45

Fold  1
Performance Training =  0.46568404087055226
Performance Validation =  0.3325499696696631

Fold  2
Performance Training =  0.4370083085121297

```
Performance Validation =  0.502882431157504


Fold  3
Performance Training =  0.42320059680438693
Performance Validation =  0.3364703177314121


Fold  4
Performance Training =  0.5424549680102302
Performance Validation =  0.3066851578046864


Average Performance in Training =  0.46708697854932474
Average Performance in Validation =  0.369646969280378
------------------------------------------------------


M Value =  3
Lambda Value =  0.46


Fold  1
Performance Training =  0.46488306261867585
Performance Validation =  0.3304022491915506


Fold  2
Performance Training =  0.4361633665516278
Performance Validation =  0.5013561301208194


Fold  3
Performance Training =  0.4220527042300304
Performance Validation =  0.3349783683505313


Fold  4
Performance Training =  0.5411817081555838
Performance Validation =  0.3064797940538757


Average Performance in Training =  0.46607021038897944
Average Performance in Validation =  0.3683041354291942
------------------------------------------------------


M Value =  3
Lambda Value =  0.47000000000000003


Fold  1
Performance Training =  0.4640959664887908
Performance Validation =  0.32830551999450064


Fold  2
Performance Training =  0.43533402758021034
Performance Validation =  0.499859501284456


Fold  3
Performance Training =  0.4209226222302389
Performance Validation =  0.33350568475970377


Fold  4
Performance Training =  0.5399277592120266
Performance Validation =  0.306272834046162
```

```
Average Performance in Training =  0.46507009387781667
Average Performance in Validation =  0.3669858850212056
-------------------------------------------------------

M Value =  3
Lambda Value =  0.48

Fold  1
Performance Training =  0.4633223210685816
Performance Validation =  0.32625824273193516

Fold  2
Performance Training =  0.43451979305723376
Performance Validation =  0.49839164468494324

Fold  3
Performance Training =  0.4198099370615851
Performance Validation =  0.332051714124427

Fold  4
Performance Training =  0.5386927033986901
Performance Validation =  0.30606448437274847

Average Performance in Training =  0.4640861886465226
Average Performance in Validation =  0.36569152147851347
-------------------------------------------------------

M Value =  3
Lambda Value =  0.49

Fold  1
Performance Training =  0.46256171576639027
Performance Validation =  0.3242589400900281

Fold  2
Performance Training =  0.43372018845018123
Performance Validation =  0.4969516970444333

Fold  3
Performance Training =  0.4187142489294948
Performance Validation =  0.33061593043402504

Fold  4
Performance Training =  0.5374761335334568
Performance Validation =  0.30585493936003105

Average Performance in Training =  0.4631180716698808
Average Performance in Validation =  0.36442037673212935
-------------------------------------------------------

M Value =  3
Lambda Value =  0.5

Fold  1
Performance Training =  0.4618137591724396
Performance Validation =  0.32230619320443554
```

```
Fold  2
Performance Training =  0.4329347614172251
Performance Validation =  0.495538830314481


Fold  3
Performance Training =  0.4176351710463727
Performance Validation =  0.32919783234267963


Fold  4
Performance Training =  0.5362776525717887
Performance Validation =  0.30564438147179795


Average Performance in Training =  0.46216533605195653
Average Performance in Validation =  0.3631718093333485
----------------------------------------------------


M Value =  3
Lambda Value =  0.51


Fold  1
Performance Training =  0.4610780776082697
Performance Validation =  0.32039863839048155


Fold  2
Performance Training =  0.43216308019032457
Performance Validation =  0.49415224965609117


Fold  3
Performance Training =  0.4165723288116987
Performance Validation =  0.32779694126019887


Fold  4
Performance Training =  0.5350968732067048
Performance Validation =  0.3054329817556337


Average Performance in Training =  0.4612275899542495
Average Performance in Validation =  0.3619452027656014
----------------------------------------------------


M Value =  3
Lambda Value =  0.52


Fold  1
Performance Training =  0.4603543138375431
Performance Validation =  0.31853496414784277


Fold  2
Performance Training =  0.4314047321308424
Performance Validation =  0.49279119159025964


Fold  3
Performance Training =  0.41552535909389343
Performance Validation =  0.3264127996571269


Fold  4
```

Performance Training =  0.5339334175177235
Performance Validation =  0.30522090031789184

Average Performance in Training =  0.4603044556450006
Average Performance in Validation =  0.3607399639282803
----------------------------------------------------

M Value =  3
Lambda Value =  0.53

Fold  1
Performance Training =  0.4596421259156931
Performance Validation =  0.3167139084068016

Fold  2
Performance Training =  0.4306593224341667
Performance Validation =  0.4914549222987059

Fold  3
Performance Training =  0.4144939095973732
Performance Validation =  0.3250449695544645

Fold  4
Performance Training =  0.5327869166590531
Performance Validation =  0.3050082868150201

Average Performance in Training =  0.45939556865157155
Average Performance in Validation =  0.35955552176874805
----------------------------------------------------

M Value =  3
Lambda Value =  0.54

Fold  1
Performance Training =  0.45894118615947566
Performance Validation =  0.3149342559881091

Fold  2
Performance Training =  0.4299264729635255
Performance Validation =  0.49014273605752523

Fold  3
Performance Training =  0.4134776383011258
Performance Validation =  0.32369303117290316

Fold  4
Performance Training =  0.5316570105792728
Performance Validation =  0.3047952809517268

Average Performance in Training =  0.45850057700084995
Average Performance in Validation =  0.35839132604256607
----------------------------------------------------

M Value =  3
Lambda Value =  0.55

```
Fold  1
Performance Training =  0.45825118022044165
Performance Validation =  0.3131948362526096

Fold  2
Performance Training =  0.4292058211962393
Performance Validation =  0.48885395378900776

Fold  3
Performance Training =  0.4124762129575389
Performance Validation =  0.3223565817204106

Fold  4
Performance Training =  0.530543347766321
Performance Validation =  0.30458201297867815

Average Performance in Training =  0.4576191405351352
Average Performance in Validation =  0.35724684618517655
------------------------------------------------------

M Value =  3
Lambda Value =  0.56

Fold  1
Performance Training =  0.4575718062487819
Performance Validation =  0.31149452092019203

Fold  2
Performance Training =  0.42849701926820094
Performance Validation =  0.4875879217189877

Fold  3
Performance Training =  0.41148931064216165
Performance Validation =  0.32103523430013603

Fold  4
Performance Training =  0.5294455850128588
Performance Validation =  0.3043686041841266

Average Performance in Training =  0.4567509302930008
Average Performance in Validation =  0.35612157028086056
------------------------------------------------------

M Value =  3
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.45690277413606273
Performance Validation =  0.30983222204048877

Fold  2
Performance Training =  0.42779973310448005
Performance Validation =  0.48634401012881434

Fold  3
Performance Training =  0.41051661734667166
```

Performance Validation =  0.3197286169233525

Fold  4
Performance Training =  0.5283633871980962
Performance Validation =  0.30415516737527837

Average Performance in Training =  0.45589562794632765
Average Performance in Validation =  0.3550150041169835
------------------------------------------------------

M Value =  3
Lambda Value =  0.58

Fold  1
Performance Training =  0.45624380482703797
Performance Validation =  0.30820689010012525

Fold  2
Performance Training =  0.42711364162572285
Performance Validation =  0.4851216121925186

Fold  3
Performance Training =  0.4095578276086461
Performance Validation =  0.31843637161439076

Fold  4
Performance Training =  0.5272964270829658
Performance Validation =  0.30394180734629295

Average Performance in Training =  0.4550529252860932
Average Performance in Validation =  0.3539266703133319
------------------------------------------------------

M Value =  3
Lambda Value =  0.59

Fold  1
Performance Training =  0.4555946296921851
Performance Validation =  0.306617512253333

Fold  2
Performance Training =  0.42643843602149034
Performance Validation =  0.48392014289097807

Fold  3
Performance Training =  0.40861264417280097
Performance Validation =  0.3171581535963375

Fold  4
Performance Training =  0.526244385116178
Performance Validation =  0.303728621330699

Average Performance in Training =  0.4542225237506636
Average Performance in Validation =  0.3528561075178369
------------------------------------------------------

```
M Value =  3
Lambda Value =  0.6

Fold   1
Performance Training =  0.4549549899537765
Performance Validation =  0.30506311066443703

Fold   2
Performance Training =  0.4257738190829188
Performance Validation =  0.482739037995922

Fold   3
Performance Training =  0.40768077767925925
Performance Validation =  0.3158936305479706

Fold   4
Performance Training =  0.5252069492492204
Performance Validation =  0.3035156994366984

Average Performance in Training =  0.45340413399129376
Average Performance in Validation =  0.35180286966125696
------------------------------------------------------

M Value =  3
Lambda Value =  0.61

Fold   1
Performance Training =  0.45432463615932484
Performance Validation =  0.30354274095214395

Fold   2
Performance Training =  0.4251195045881425
Performance Validation =  0.4815777531175056

Fold   3
Performance Training =  0.4067619463751353
Performance Validation =  0.3146424819236108

Fold   4
Performance Training =  0.5241838147587552
Performance Validation =  0.3033031250643837

Average Performance in Training =  0.45259747547033946
Average Performance in Validation =  0.350766525264411
------------------------------------------------------

M Value =  3
Lambda Value =  0.62

Fold   1
Performance Training =  0.4537033276970822
Performance Validation =  0.3020554907268035

Fold   2
Performance Training =  0.4244752167347906
Performance Validation =  0.4804357628099346
```

Fold  3
Performance Training =  0.4058558758463373
Performance Validation =  0.31340439832879785


Fold  4
Performance Training =  0.5231746840752299
Performance Validation =  0.3030909753043225


Average Performance in Training =  0.45180227608836
Average Performance in Validation =  0.3497466567924646
------------------------------------------------------

M Value =  3
Lambda Value =  0.63

Fold  1
Performance Training =  0.4530908323489907
Performance Validation =  0.30060047821282276


Fold  2
Performance Training =  0.4238406896146334
Performance Validation =  0.47931255973026066


Fold  3
Performance Training =  0.4049622987669902
Performance Validation =  0.3121790809456153


Fold  4
Performance Training =  0.5221792666167572
Performance Validation =  0.30287932131730233


Average Performance in Training =  0.45101827183684284
Average Performance in Validation =  0.34874286005150024
------------------------------------------------------

M Value =  3
Lambda Value =  0.64

Fold  1
Performance Training =  0.4524869258771005
Performance Validation =  0.2991768509493351


Fold  2
Performance Training =  0.42321566672607736
Performance Validation =  0.4782076538460186


Fold  3
Performance Training =  0.4040809546642883
Performance Validation =  0.3109662410023074


Fold  4
Performance Training =  0.5211972786275393
Performance Validation =  0.3026682286952931


Average Performance in Training =  0.4502452064737513

Average Performance in Validation =  0.34775474362323855
----------------------------------------------------

M Value =  3
Lambda Value =  0.65

Fold  1
Performance Training =  0.4518913916399805
Performance Validation =  0.2977837845629575

Fold  2
Performance Training =  0.42259990052076624
Performance Validation =  0.4771205716878535

Fold  3
Performance Training =  0.40321158969694415
Performance Validation =  0.3097655992825217

Fold  4
Performance Training =  0.5202284430202844
Performance Validation =  0.3024577578038735

Average Performance in Training =  0.44948283121949384
Average Performance in Validation =  0.34678192833430155
----------------------------------------------------

M Value =  3
Lambda Value =  0.66

Fold  1
Performance Training =  0.4513040202361005
Performance Validation =  0.29642048160716594

Fold  2
Performance Training =  0.42199315198099385
Performance Validation =  0.47605085564368965

Fold  3
Performance Training =  0.40235395644568406
Performance Validation =  0.3085768856701264

Fold  4
Performance Training =  0.5192724892221814
Performance Validation =  0.302247964106533

Average Performance in Training =  0.44873090447124
Average Performance in Validation =  0.3458240467568788
----------------------------------------------------

M Value =  3
Lambda Value =  0.67

Fold  1
Performance Training =  0.4507246091715297
Performance Validation =  0.29508617046334495

```
Fold  2
Performance Training =  0.4213951902250531
Performance Validation =  0.4749980632913571


Fold  3
Performance Training =  0.40150781371447375
Performance Validation =  0.30739983872602883


Fold  4
Performance Training =  0.5183291530241225
Performance Validation =  0.3020388984713577


Average Performance in Training =  0.44798919153379474
Average Performance in Validation =  0.34488074273802216
-----------------------------------------------------

M Value =  3
Lambda Value =  0.68

Fold  1
Performance Training =  0.4501529625496382
Performance Validation =  0.2937801042991156


Fold  2
Performance Training =  0.42080579213796243
Performance Validation =  0.47396176676688495


Fold  3
Performance Training =  0.40067292634137264
Performance Validation =  0.3062342052938978


Fold  4
Performance Training =  0.5173981764329225
Performance Validation =  0.3018306074607041


Average Performance in Training =  0.447257464365474
Average Performance in Validation =  0.34395167095515067
-----------------------------------------------------

M Value =  3
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.4495888907807488
Performance Validation =  0.2925015600799258


Fold  2
Performance Training =  0.42022474202533433
Performance Validation =  0.4729415521659621


Fold  3
Performance Training =  0.3998490650180554
Performance Validation =  0.30507974013202555


Fold  4
Performance Training =  0.5164793075263696
```

Performance Validation =  0.30162313360449977

Average Performance in Training =  0.44653550133762704
Average Performance in Validation =  0.3430364964956033
------------------------------------------------------

M Value =  3
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.449032210309943
Performance Validation =  0.2912498376303071

Fold  2
Performance Training =  0.41965183128838024
Performance Validation =  0.47193701897628215

Fold  3
Performance Training =  0.399036006117213
Performance Validation =  0.30393620556890544

Fold  4
Performance Training =  0.5155723003109698
Performance Validation =  0.3014165156578651

Average Performance in Training =  0.4458230870066265
Average Performance in Validation =  0.3421348944583399
------------------------------------------------------

M Value =  3
Lambda Value =  0.71

Fold  1
Performance Training =  0.4484827433614237
Performance Validation =  0.29002425874150717

Fold  2
Performance Training =  0.4190868581182853
Performance Validation =  0.4709477795387047

Fold  3
Performance Training =  0.3982335315271297
Performance Validation =  0.3028033711804302

Fold  4
Performance Training =  0.5146769145823058
Performance Validation =  0.30121078884375585

Average Performance in Training =  0.4451200118972861
Average Performance in Validation =  0.34124654957609946
------------------------------------------------------

M Value =  3
Lambda Value =  0.72

Fold  1

```
Performance Training =  0.4479403176980171
Performance Validation =  0.28882416632252117


Fold  2
Performance Training =  0.4185296272083704
Performance Validation =  0.46997345853535655


Fold  3
Performance Training =  0.39744142849284925
Performance Validation =  0.30168101348674914


Fold  4
Performance Training =  0.513792915787942
Performance Validation =  0.30100598508133536


Average Performance in Training =  0.44442607229679465
Average Performance in Validation =  0.3403711558564905
----------------------------------------------------

M Value =  3
Lambda Value =  0.73


Fold  1
Performance Training =  0.44740476639456284
Performance Validation =  0.2876489235917771


Fold  2
Performance Training =  0.4179799494826254
Performance Validation =  0.46901369250294855


Fold  3
Performance Training =  0.39665948946342044
Performance Validation =  0.30056891566715505


Fold  4
Performance Training =  0.512920074892836
Performance Validation =  0.30080213320079063


Average Performance in Training =  0.44374107005836116
Average Performance in Validation =  0.3395084162406678
----------------------------------------------------

M Value =  3
Lambda Value =  0.74


Fold  1
Performance Training =  0.4468759276240607
Performance Validation =  0.28649791330699204


Fold  2
Performance Training =  0.41743764183934706
Performance Validation =  0.4680681293697263


Fold  3
Performance Training =  0.3958875119447788
Performance Validation =  0.29946686729147776
```

```
Fold  4
Performance Training =  0.5120581682472349
Performance Validation =  0.3005992591452834

Average Performance in Training =  0.44306481241385537
Average Performance in Validation =  0.33865804227836993
-------------------------------------------------

M Value =  3
Lambda Value =  0.75

Fold  1
Performance Training =  0.446353644455575
Performance Validation =  0.2853705370308962

Fold  2
Performance Training =  0.41690252690874563
Performance Validation =  0.4671364280146182

Fold  3
Performance Training =  0.39512529835788024
Performance Validation =  0.29837466406664115

Fold  4
Performance Training =  0.5112069774570354
Performance Validation =  0.30039738616072253

Average Performance in Training =  0.44239711179480906
Average Performance in Validation =  0.33781975381821955
-------------------------------------------------

M Value =  3
Lambda Value =  0.76

Fold  1
Performance Training =  0.44583776466299607
Performance Validation =  0.2842662144307102

Fold  2
Performance Training =  0.4163744328234863
Performance Validation =  0.46621825784723836

Fold  3
Performance Training =  0.39437265590175064
Performance Validation =  0.2972921075971955

Fold  4
Performance Training =  0.5103662892566054
Performance Validation =  0.3001965349740211

Average Performance in Training =  0.44173778566120964
Average Performance in Validation =  0.33699327871229134
-------------------------------------------------

M Value =  3
```

```
Lambda Value =  0.77

Fold  1
Performance Training =  0.44532814054384884
Performance Validation =  0.28318438260943324

Fold  2
Performance Training =  0.41585319300124346
Performance Validation =  0.4653132984075229

Fold  3
Performance Training =  0.3936293964211608
Performance Validation =  0.29621900515874633

Fold  4
Performance Training =  0.5095358953840592
Performance Validation =  0.29999672396047383

Average Performance in Training =  0.4410866563375781
Average Performance in Validation =  0.33617835253404404
----------------------------------------------------

M Value =  3
Lambda Value =  0.78

Fold  1
Performance Training =  0.444824628747418
Performance Validation =  0.28212449546713436

Fold  2
Performance Training =  0.41533864593842174
Performance Validation =  0.46442123898385834

Fold  3
Performance Training =  0.392895336278659
Performance Validation =  0.29515516948330245

Fold  4
Performance Training =  0.5087155924589851
Performance Validation =  0.29979796930087665

Average Performance in Training =  0.44044355085587095
Average Performance in Validation =  0.33537471830879295
----------------------------------------------------

M Value =  3
Lambda Value =  0.79

Fold  1
Performance Training =  0.4443270901115286
Performance Validation =  0.28108602309058084

Fold  2
Performance Training =  0.41483063501428497
Performance Validation =  0.46354177824865395
```

Fold  3
Performance Training =  0.3921702962307390
Performance Validation =  0.29410041855568136

Fold  4
Performance Training =  0.5079051818626258
Performance Validation =  0.2996002851289713

Average Performance in Training =  0.4398083008047946
Average Performance in Validation =  0.33458212625597183
----------------------------------------------------

M Value =  3
Lambda Value =  0.8

Fold  1
Performance Training =  0.4438353895073943
Performance Validation =  0.2800684511696536

Fold  2
Performance Training =  0.4143290083047928
Performance Validation =  0.4626746239103797

Fold  3
Performance Training =  0.39145410130793057
Performance Validation =  0.2930545754201844

Fold  4
Performance Training =  0.5071044696205069
Performance Validation =  0.29940368366978287

Average Performance in Training =  0.4391807421851561
Average Performance in Validation =  0.33380033354250016
----------------------------------------------------

M Value =  3
Lambda Value =  0.81

Fold  1
Performance Training =  0.4433493956919762
Performance Validation =  0.2790712804391041

Fold  2
Performance Training =  0.41383361840551725
Performance Validation =  0.4618194923811646

Fold  3
Performance Training =  0.39074658069863377
Performance Validation =  0.2920174679968137

Fold  4
Performance Training =  0.5063132662875122
Performance Validation =  0.29920817536938327

Average Performance in Training =  0.4385607152709098
Average Performance in Validation =  0.33302910404661645

```
------------------------------------------------------

M Value =  3
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.4428689811673706
Performance Validation =  0.27809402614431644

Fold  2
Performance Training =  0.41334432226304973
Performance Validation =  0.46097610845910686

Fold  3
Performance Training =  0.39004756763651993
Performance Validation =  0.2909889289063923

Fold  4
Performance Training =  0.5055313868353968
Performance Validation =  0.29901376901659205

Average Performance in Training =  0.43794806447558426
Average Performance in Validation =  0.33226820813160196
------------------------------------------------------

M Value =  3
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.44239402204677136
Performance Validation =  0.2771362175298161

Fold  2
Performance Training =  0.4128609810143792
Performance Validation =  0.4601442050245158

Fold  3
Performance Training =  0.38935689929136386
Performance Validation =  0.28996879530400166

Fold  4
Performance Training =  0.5047586505427342
Performance Validation =  0.2988204718570926

Average Performance in Training =  0.43734263822381214
Average Performance in Validation =  0.3315174224288565
------------------------------------------------------

M Value =  3
Lambda Value =  0.84

Fold  1
Performance Training =  0.441924397926592
Performance Validation =  0.2761973973493582

Fold  2
```

```
Performance Training =  0.412383459833742
Performance Validation =  0.4593235227493413


Fold  3
Performance Training =  0.3886744166631487
Performance Validation =  0.2889569087201864


Fold  4
Performance Training =  0.5039948808872803
Performance Validation =  0.29862828970042876


Average Performance in Training =  0.43674428882769073
Average Performance in Validation =  0.33077652962982873
------------------------------------------------------

M Value =  3
Lambda Value =  0.85


Fold  1
Performance Training =  0.44145999176437667
Performance Validation =  0.27527712139649674


Fold  2
Performance Training =  0.41191162778650214
Performance Validation =  0.45851380981911216


Fold  3
Performance Training =  0.38799996447933227
Performance Validation =  0.287953114909442


Fold  4
Performance Training =  0.503239905440745
Performance Validation =  0.29843722702030484


Average Performance in Training =  0.43615287236773903
Average Performance in Validation =  0.33004531828633893
------------------------------------------------------

M Value =  3
Lambda Value =  0.86


Fold  1
Performance Training =  0.44100068976214624
Performance Validation =  0.27437495805460965


Fold  2
Performance Training =  0.4114453576896434
Performance Validation =  0.4577148216667334


Fold  3
Performance Training =  0.38733339109514675
Performance Validation =  0.2869572637055271


Fold  4
Performance Training =  0.5024935557659529
Performance Validation =  0.29824728704860226
```

```
Average Performance in Training =  0.43556824857822235
Average Performance in Validation =  0.32932358261886807
----------------------------------------------------

M Value =  3
Lambda Value =  0.87

Fold  1
Performance Training =  0.44054638125486656
Performance Validation =  0.2734904878654165

Fold  2
Performance Training =  0.41098452597849433
Performance Validation =  0.4569263207175406

Fold  3
Performance Training =  0.3866745483968278
Performance Validation =  0.2859692088832064

Fold  4
Performance Training =  0.5017556673163712
Performance Validation =  0.2980584718634962

Average Performance in Training =  0.43499028073664
Average Performance in Validation =  0.3286111223324149
----------------------------------------------------

M Value =  3
Lambda Value =  0.88

Fold  1
Performance Training =  0.44009695860374054
Performance Validation =  0.27262330311508165

Fold  2
Performance Training =  0.4105290125793316
Performance Validation =  0.4561480761450516

Fold  3
Performance Training =  0.3860232917076667
Performance Validation =  0.2849888080260172

Fold  4
Performance Training =  0.5010260793379877
Performance Validation =  0.29787078247203413

Average Performance in Training =  0.43441883555718164
Average Performance in Validation =  0.3279077424395462
----------------------------------------------------

M Value =  3
Lambda Value =  0.89

Fold  1
Performance Training =  0.4396523170940587
```

```
Performance Validation =  0.27177300743705635


Fold  2
Performance Training =  0.4100787007875307
Performance Validation =  0.4553798636368742


Fold  3
Performance Training =  0.38537947969679187
Performance Validation =  0.28401592239972606


Fold  4
Performance Training =  0.5003046347735056
Performance Validation =  0.29768421888751484


Average Performance in Training =  0.43385378308797173
Average Performance in Validation =  0.32721325309029287
------------------------------------------------------


M Value =  3
Lambda Value =  0.9


Fold  1
Performance Training =  0.439212354837344
Performance Validation =  0.2709392154308514


Fold  2
Performance Training =  0.4096334771509639
Performance Validation =  0.4546214651702766


Fold  3
Performance Training =  0.38474297429058946
Performance Validation =  0.2830504168311585


Fold  4
Performance Training =  0.4995911801688373
Performance Validation =  0.2974987802019943


Average Performance in Training =  0.43329499661193366
Average Performance in Validation =  0.32652746940857014
------------------------------------------------------


M Value =  3
Lambda Value =  0.91


Fold  1
Performance Training =  0.438776972677576
Performance Validation =  0.27012155229599377


Fold  2
Performance Training =  0.40919323135836094
Performance Validation =  0.4538726687969491


Fold  3
Performance Training =  0.3841136405866725
Performance Validation =  0.2820921595920777
```

```
Fold  4
Performance Training =  0.49888556558185815
Performance Validation =  0.2973144646542121

Average Performance in Training =  0.4327423525511169
Average Performance in Validation =  0.3258502113348082
------------------------------------------------------

M Value =  3
Lambda Value =  0.92

Fold  1
Performance Training =  0.4383460741012609
Performance Validation =  0.2693196534804505

Fold  2
Performance Training =  0.4087578561323685
Performance Validation =  0.45313326843651425

Fold  3
Performance Training =  0.3834913467703266
Performance Validation =  0.28114102228786797

Fold  4
Performance Training =  0.4981876444933968
Performance Validation =  0.29713126969323056

Average Performance in Training =  0.43219573037433817
Average Performance in Validation =  0.3251813034745158
------------------------------------------------------

M Value =  3
Lambda Value =  0.93

Fold  1
Performance Training =  0.43791956515115715
Performance Validation =  0.2685331643428459

Fold  2
Performance Training =  0.4083272471270626
Performance Validation =  0.452403063678365

Fold  3
Performance Training =  0.38287596403334334
Performance Validation =  0.2801968797507377

Fold  4
Performance Training =  0.49749727372042396
Performance Validation =  0.2969491920380436

Average Performance in Training =  0.43165501250799676
Average Performance in Validation =  0.32452057495249803
------------------------------------------------------

M Value =  3
Lambda Value =  0.9400000000000001
```

```
Fold  1
Performance Training =  0.4374973543434634
Performance Validation =  0.2677617398278428

Fold  2
Performance Training =  0.40790130282968606
Performance Validation =  0.4516818595914408

Fold  3
Performance Training =  0.382267366495175
Performance Validation =  0.279259609937222

Fold  4
Performance Training =  0.4968143133314036
Performance Validation =  0.29676822773341216

Average Performance in Training =  0.431120084249932
Average Performance in Validation =  0.3238678592724794
---------------------------------------------------

M Value =  3
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.4370793525882949
Performance Validation =  0.2670050441540831

Fold  2
Performance Training =  0.40747992446639303
Performance Validation =  0.4509694665415669

Fold  3
Performance Training =  0.3816654311263391
Performance Validation =  0.2783290938297519

Fold  4
Performance Training =  0.49613862656377594
Performance Validation =  0.29658837220215706

Average Performance in Training =  0.4305908336862007
Average Performance in Validation =  0.3232229941818897
---------------------------------------------------

M Value =  3
Lambda Value =  0.96

Fold  1
Performance Training =  0.43666547311328796
Performance Validation =  0.2662627505141233

Fold  2
Performance Training =  0.4070630159118046
Performance Validation =  0.4502657000160065

Fold  3
```

```
Performance Training = 0.381070036740004
Performance Validation = 0.2774052153420937


Fold  4
Performance Training = 0.49547007974352963
Performance Validation = 0.29640962029412976


Average Performance in Training =  0.4300671516106557
Average Performance in Validation =  0.3225858215415883
-------------------------------------------------------


M Value =  3
Lambda Value =  0.97


Fold  1
Performance Training =  0.436255631390172
Performance Validation =  0.2655345407858204


Fold  2
Performance Training =  0.40665048360218403
Performance Validation =  0.4495703804548913


Fold  3
Performance Training =  0.38048106858966724
Performance Validation =  0.2764878612284546


Fold  4
Performance Training =  0.49480854220682624
Performance Validation =  0.2962319663320686


Average Performance in Training =  0.42954893144721235
Average Performance in Validation =  0.3219561872003087
-------------------------------------------------------


M Value =  3
Lambda Value =  0.98


Fold  1
Performance Training =  0.4358497450641743
Performance Validation =  0.26482010525467037


Fold  2
Performance Training =  0.4062422364520535
Performance Validation =  0.4488833330892199


Fold  3
Performance Training =  0.37989840895894134
Performance Validation =  0.27557692099607656


Fold  4
Performance Training =  0.49415388622363876
Performance Validation =  0.2960554041545318


Average Performance in Training =  0.42903606917470194
Average Performance in Validation =  0.32133394087362466
-------------------------------------------------------
```

```
M Value =  3
Lambda Value =  0.99

Fold  1
Performance Training =  0.4354477338861148
Performance Validation =  0.26411914234660183

Fold  2
Performance Training =  0.4058381857740918
Performance Validation =  0.4482043877851246

Fold  3
Performance Training =  0.379321946433256
Performance Validation =  0.2746722868211542

Fold  4
Performance Training =  0.4935059869233631
Performance Validation =  0.29587992715609124

Average Performance in Training =  0.4285284632542064
Average Performance in Validation =  0.320718936027243
------------------------------------------------------

M Value =  3
Lambda Value =  1.0

Fold  1
Performance Training =  0.4350495196470715
Performance Validation =  0.2634313583707816

Fold  2
Performance Training =  0.40543824520214855
Performance Validation =  0.44753337889411837

Fold  3
Performance Training =  0.37875157116354585
Performance Validation =  0.27377385346792327

Fold  4
Performance Training =  0.4928647222223621
Performance Validation =  0.295705528324955

Average Performance in Training =  0.42802601455878203
Average Performance in Validation =  0.32011102976444455
------------------------------------------------------

M Value =  3
Lambda Value =  1.01

Fold  1
Performance Training =  0.434655026115491
Performance Validation =  0.2627564672719833

Fold  2
Performance Training =  0.40504233061724015
```

Performance Validation =  0.4468701451090673

Fold  3
Performance Training =  0.37818717573579197
Performance Validation =  0.272881518210742

Fold  4
Performance Training =  0.4922299727534032
Performance Validation =  0.2955322002781803

Average Performance in Training =  0.4275286263054816
Average Performance in Validation =  0.31951008271749326
-----------------------------------------------------

M Value =  3
Lambda Value =  1.02

Fold  1
Performance Training =  0.43426417897663694
Performance Validation =  0.2620941903921207

Fold  2
Performance Training =  0.4046503600763738
Performance Validation =  0.4462145293256248

Fold  3
Performance Training =  0.37762865510838517
Performance Validation =  0.27199518075906837

Fold  4
Performance Training =  0.4916016217969451
Performance Validation =  0.29535993529462334

Average Performance in Training =  0.4270362039895853
Average Performance in Validation =  0.3189159589428593
-----------------------------------------------------

M Value =  3
Lambda Value =  1.03

Fold  1
Performance Training =  0.43387690577426896
Performance Validation =  0.2614442562405359

Fold  2
Performance Training =  0.40426225374408176
Performance Validation =  0.4455663785088867

Fold  3
Performance Training =  0.37707590655125633
Performance Validation =  0.27111474318516704

Fold  4
Performance Training =  0.49097955521423764
Performance Validation =  0.29518872534577045

```
Average Performance in Training =  0.4265486553209612
Average Performance in Validation =  0.31832852582009
--------------------------------------------------------

M Value =  3
Lambda Value =  1.04

Fold  1
Performance Training =  0.43349313585445026
Performance Validation =  0.26080640027268964

Fold  2
Performance Training =  0.4038779338265377
Performance Validation =  0.4449255435650529

Fold  3
Performance Training =  0.37652882958672007
Performance Validation =  0.27024010985443725

Fold  4
Performance Training =  0.49036366138218734
Performance Validation =  0.2950185621245781

Average Performance in Training =  0.4260658901624738
Average Performance in Validation =  0.31774765395418947
--------------------------------------------------------

M Value =  3
Lambda Value =  1.05

Fold  1
Performance Training =  0.4331128003113953
Performance Validation =  0.26018036467688344

Fold  2
Performance Training =  0.4034973245081366
Performance Validation =  0.44429187921785473

Fold  3
Performance Training =  0.37598732593198236
Performance Validation =  0.2693711873582453

Fold  4
Performance Training =  0.4897538311299535
Performance Validation =  0.29484943707244715

Average Performance in Training =  0.4255878204703669
Average Performance in Validation =  0.31717321708135765
--------------------------------------------------------

M Value =  3
Lambda Value =  1.06

Fold  1
Performance Training =  0.43273583193526144
Performance Validation =  0.2595658981686806
```

```
Fold  2
Performance Training =  0.4031203518904316
Performance Validation =  0.4436652438895674


Fold  3
Performance Training =  0.37545129944326516
Performance Validation =  0.2685078844491471


Fold  4
Performance Training =  0.4891499576772317
Performance Validation =  0.2946813414044469


Average Performance in Training =  0.4251143602365475
Average Performance in Validation =  0.3166050919779605
----------------------------------------------------


M Value =  3
Lambda Value =  1.07


Fold  1
Performance Training =  0.4323621651618065
Performance Validation =  0.25896275579271266


Fold  2
Performance Training =  0.4027469439333231
Performance Validation =  0.44304549958639294


Fold  3
Performance Training =  0.37492065606149616
Performance Validation =  0.26765011197839206


Fold  4
Performance Training =  0.4885519365741823
Performance Validation =  0.2945142661328958


Average Performance in Training =  0.424645425432702
Average Performance in Validation =  0.31604315837259833
----------------------------------------------------


M Value =  3
Lambda Value =  1.08


Fold  1
Performance Training =  0.43199173602382945
Performance Validation =  0.2583706987315504


Fold  2
Performance Training =  0.40237703039839756
Performance Validation =  0.4424325117880382


Fold  3
Performance Training =  0.3743953037595237
Performance Validation =  0.26679778283563105


Fold  4
```

```
Performance Training =  0.4879596656429679
Performance Validation =  0.2943482020894014


Average Performance in Training =  0.4241809339561796
Average Performance in Validation =  0.31548729886115523
------------------------------------------------------


M Value =  3
Lambda Value =  1.09


Fold  1
Performance Training =  0.43162448210431836
Performance Validation =  0.2577894941213671


Fold  2
Performance Training =  0.4020105427943308
Performance Validation =  0.4418261493413055


Fold  3
Performance Training =  0.37387515249080727
Performance Validation =  0.2659508118907019


Fold  4
Performance Training =  0.48737304492085565
Performance Validation =  0.294183139945455


Average Performance in Training =  0.4237208055775781
Average Performance in Validation =  0.3149373988247074
------------------------------------------------------


M Value =  4
Lambda Value =  0.01


Fold  1
Performance Training =  0.6977346263042075
Performance Validation =  0.6889954494261307


Fold  2
Performance Training =  0.6823647258657786
Performance Validation =  0.7599683901646843


Fold  3
Performance Training =  0.6720944106242213
Performance Validation =  0.640729805893355


Fold  4
Performance Training =  0.7499697338637534
Performance Validation =  0.5038412815348008


Average Performance in Training =  0.7005408741644902
Average Performance in Validation =  0.6483837317547427
------------------------------------------------------


M Value =  4
Lambda Value =  0.02
```

```
Fold  1
Performance Training =  0.664789488048068
Performance Validation =  0.6935393470332762

Fold  2
Performance Training =  0.6495893855476966
Performance Validation =  0.7441650627775049

Fold  3
Performance Training =  0.6413778546963123
Performance Validation =  0.6021937272437197

Fold  4
Performance Training =  0.7303500368648707
Performance Validation =  0.4600098755026383

Average Performance in Training =  0.6715266912892369
Average Performance in Validation =  0.6249770031392848
------------------------------------------------------

M Value =  4
Lambda Value =  0.03

Fold  1
Performance Training =  0.6408009966964263
Performance Validation =  0.679388748881653

Fold  2
Performance Training =  0.6252296803875009
Performance Validation =  0.7280281590374029

Fold  3
Performance Training =  0.618767841442982
Performance Validation =  0.5735800909606941

Fold  4
Performance Training =  0.7150793289617837
Performance Validation =  0.4327398239551187

Average Performance in Training =  0.6499694618721733
Average Performance in Validation =  0.6034342057087172
------------------------------------------------------

M Value =  4
Lambda Value =  0.04

Fold  1
Performance Training =  0.6232396216206748
Performance Validation =  0.6634071085551293

Fold  2
Performance Training =  0.607135169306916
Performance Validation =  0.7144783396495185

Fold  3
Performance Training =  0.6020706110619134
```

Performance Validation =  0.5521848313796933

Fold  4
Performance Training =  0.7033666114751644
Performance Validation =  0.4144090583437888

Average Performance in Training =  0.6339530033661671
Average Performance in Validation =  0.5861198344820324
------------------------------------------------------

M Value =  4
Lambda Value =  0.05

Fold  1
Performance Training =  0.6099266411244274
Performance Validation =  0.6487019180778618

Fold  2
Performance Training =  0.5932706971914933
Performance Validation =  0.7032797709156292

Fold  3
Performance Training =  0.5893188825940822
Performance Validation =  0.5356171467149364

Fold  4
Performance Training =  0.6941565110388137
Performance Validation =  0.4013937595078717

Average Performance in Training =  0.6216681829872042
Average Performance in Validation =  0.5722481488040748
------------------------------------------------------

M Value =  4
Lambda Value =  0.06

Fold  1
Performance Training =  0.5994811452066078
Performance Validation =  0.6356924028764812

Fold  2
Performance Training =  0.5823006949924159
Performance Validation =  0.6938917419459634

Fold  3
Performance Training =  0.5792447108089465
Performance Validation =  0.5223397746810279

Fold  4
Performance Training =  0.6866980559878745
Performance Validation =  0.39176955371736066

Average Performance in Training =  0.6119311517489612
Average Performance in Validation =  0.5609233683052083
------------------------------------------------------

```
M Value =  4
Lambda Value =  0.07

Fold  1
Performance Training =  0.5910368643016227
Performance Validation =  0.6242157007185168

Fold  2
Performance Training =  0.5733702820695346
Performance Validation =  0.6858634681920176

Fold  3
Performance Training =  0.5710448271921864
Performance Validation =  0.5113789701794794

Fold  4
Performance Training =  0.6804901179678473
Performance Validation =  0.38442585817086605

Average Performance in Training =  0.6039855228827977
Average Performance in Validation =  0.55147099931522
------------------------------------------------------

M Value =  4
Lambda Value =  0.08

Fold  1
Performance Training =  0.5840345978002299
Performance Validation =  0.6140124744878737

Fold  2
Performance Training =  0.5659201516398757
Performance Validation =  0.6788625048460524

Fold  3
Performance Training =  0.5641973442056338
Performance Validation =  0.5021014975322906

Fold  4
Performance Training =  0.6751962285398827
Performance Validation =  0.3786793312809469

Average Performance in Training =  0.5973370805464056
Average Performance in Validation =  0.5434139520367909
------------------------------------------------------

M Value =  4
Lambda Value =  0.09

Fold  1
Performance Training =  0.5781010121759305
Performance Validation =  0.6048439110387562

Fold  2
Performance Training =  0.5595732992259966
Performance Validation =  0.6726490120912778
```

```
Fold  3
Performance Training =  0.5583522995025316
Performance Validation =  0.49408200070719266


Fold  4
Performance Training =  0.6705856291657813
Performance Validation =  0.37408776863815363


Average Performance in Training =  0.59165306001756
Average Performance in Validation =  0.5364156731188451
------------------------------------------------------


M Value =  4
Lambda Value =  0.1


Fold  1
Performance Training =  0.5729788760803403
Performance Validation =  0.5965142458288629


Fold  2
Performance Training =  0.5540680981355997
Performance Validation =  0.6670492166227046


Fold  3
Performance Training =  0.5532678364984233
Performance Validation =  0.48702581304803183


Fold  4
Performance Training =  0.6664962832815362
Performance Validation =  0.3703531822154553


Average Performance in Training =  0.5867027734989749
Average Performance in Validation =  0.5302356144287637
------------------------------------------------------


M Value =  4
Lambda Value =  0.11


Fold  1
Performance Training =  0.5684859245899297
Performance Validation =  0.5888686866496973


Fold  2
Performance Training =  0.5492181471634758
Performance Validation =  0.6619356430757164


Fold  3
Performance Training =  0.5487722455509081
Performance Validation =  0.480723090257851


Fold  4
Performance Training =  0.6628118343495045
Performance Validation =  0.3672680051325642


Average Performance in Training =  0.5823220379134546
```

Average Performance in Validation =  0.5246988562789572
-------------------------------------------------------

M Value =  4
Lambda Value =  0.12

Fold  1
Performance Training =  0.564489814367173
Performance Validation =  0.5817860304153183

Fold  2
Performance Training =  0.544887514329988
Performance Validation =  0.6572134017496943

Fold  3
Performance Training =  0.5447407051972957
Performance Validation =  0.47502072074224644

Fold  4
Performance Training =  0.659447019179016
Performance Validation =  0.3646836242922449

Average Performance in Training =  0.5783912632683682
Average Performance in Validation =  0.519675944299876
-------------------------------------------------------

M Value =  4
Lambda Value =  0.13

Fold  1
Performance Training =  0.5608923787277396
Performance Validation =  0.5751713079669698

Fold  2
Performance Training =  0.540975022691619
Performance Validation =  0.652810812445039

Fold  3
Performance Training =  0.5410805877534575
Performance Validation =  0.4698045833280935

Fold  4
Performance Training =  0.656338224158947
Performance Validation =  0.3624911480628258

Average Performance in Training =  0.5748215533329408
Average Performance in Validation =  0.515069462950732
-------------------------------------------------------

M Value =  4
Lambda Value =  0.14

Fold  1
Performance Training =  0.55761942997189
Performance Validation =  0.5689497151150306

Fold  2
Performance Training =  0.5374039948395147
Performance Validation =  0.6486729640572529


Fold  3
Performance Training =  0.537721904525251
Performance Validation =  0.46498801080492247


Fold  4
Performance Training =  0.6534372263473633
Performance Validation =  0.3606092066069728


Average Performance in Training =  0.5715456389210047
Average Performance in Validation =  0.5108049741460448
------------------------------------------------------

M Value =  4
Lambda Value =  0.15

Fold  1
Performance Training =  0.5546139739277527
Performance Validation =  0.5630619051100221


Fold  2
Performance Training =  0.5341153868918513
Performance Validation =  0.6447572394113299


Fold  3
Performance Training =  0.5346109276873858
Performance Validation =  0.4605040876098754


Fold  4
Performance Training =  0.6507069512263963
Performance Validation =  0.35897596265726117


Average Performance in Training =  0.5685118099333466
Average Performance in Validation =  0.5068247986971222
------------------------------------------------------

M Value =  4
Lambda Value =  0.16

Fold  1
Performance Training =  0.5518315842510724
Performance Validation =  0.5574604179685028


Fold  2
Performance Training =  0.5310630842276218
Performance Validation =  0.6410301618916323


Fold  3
Performance Training =  0.5317058307113178
Performance Validation =  0.4563003832560525


Fold  4
Performance Training =  0.6481185368609175

Performance Validation =  0.3575437332111706

Average Performance in Training =  0.5656797590127324
Average Performance in Validation =  0.5030836740818395
--------------------------------------------------------

M Value =  4
Lambda Value =  0.17

Fold  1
Performance Training =  0.5492371798582416
Performance Validation =  0.5521069890865696

Fold  2
Performance Training =  0.5282106104654234
Performance Validation =  0.6374651410234294

Fold  3
Performance Training =  0.528973644468756
Performance Validation =  0.45233527317946465

Fold  4
Performance Training =  0.6456492630941759
Performance Validation =  0.3562752805447613

Average Performance in Training =  0.5630176744716493
Average Performance in Validation =  0.4995456709585563
--------------------------------------------------------

M Value =  4
Lambda Value =  0.18

Fold  1
Performance Training =  0.5468027357390037
Performance Validation =  0.5469705182852136

Fold  2
Performance Training =  0.5255287814867764
Performance Validation =  0.6340408377665339

Fold  3
Performance Training =  0.5263880909565825
Performance Validation =  0.44857531846994747

Fold  4
Performance Training =  0.6432810653868308
Performance Validation =  0.3551411995659961

Average Performance in Training =  0.5605001683922983
Average Performance in Validation =  0.49618196852192276
--------------------------------------------------------

M Value =  4
Lambda Value =  0.19

Fold  1

```
Performance Training = 0.5445056280877374
Performance Validation = 0.5420255299034553


Fold  2
Performance Training = 0.5229940045581234
Performance Validation = 0.6307399631350838


Fold  3
Performance Training = 0.5239280148614872
Performance Validation = 0.4449933669916172


Fold  4
Performance Training = 0.6409994513451678
Performance Validation = 0.35411804250427126


Average Performance in Training =  0.558106774713129
Average Performance in Validation =  0.4929692256336069
------------------------------------------------------

M Value =  4
Lambda Value =  0.2

Fold  1
Performance Training = 0.5423274189464864
Performance Validation = 0.5372509975764596


Fold  2
Performance Training = 0.5205870261259622
Performance Validation = 0.6275483841013398


Fold  3
Performance Training = 0.521576230210762
Performance Validation = 0.4415671554737347


Fold  4
Performance Training = 0.6387926994800669
Performance Validation = 0.35318695009017675


Average Performance in Training =  0.5558208436908194
Average Performance in Validation =  0.48988837181042777
------------------------------------------------------

M Value =  4
Lambda Value =  0.21

Fold  1
Performance Training = 0.5402529507823428
Performance Validation = 0.5326294407642622


Fold  2
Performance Training = 0.5182919970327515
Performance Validation = 0.6244544503631458


Fold  3
Performance Training = 0.5193186602564279
Performance Validation = 0.43827826561678884
```

```
Fold  4
Performance Training =  0.6366512589524055
Performance Validation =  0.35233263730704945

Average Performance in Training =  0.5536287167559819
Average Performance in Validation =  0.4869236985128116
----------------------------------------------------

M Value =  4
Lambda Value =  0.22

Fold  1
Performance Training =  0.5382696631487471
Performance Validation =  0.5281462249322146

Fold  2
Performance Training =  0.5160957658148898
Performance Validation =  0.6214484818988577

Fold  3
Performance Training =  0.5171436878047544
Performance Validation =  0.43511133437216

Fold  4
Performance Training =  0.6345672945562901
Performance Validation =  0.3515426316333984

Average Performance in Training =  0.5515191028311703
Average Performance in Validation =  0.4840621682091577
----------------------------------------------------

M Value =  4
Lambda Value =  0.23

Fold  1
Performance Training =  0.5363670708214432
Performance Validation =  0.5237890153956133

Fold  2
Performance Training =  0.5139873382339208
Performance Validation =  0.6185223749850514

Fold  3
Performance Training =  0.5150416587676857
Performance Validation =  0.4320534493809671

Fold  4
Performance Training =  0.6325343380721377
Performance Validation =  0.35080669388060326

Average Performance in Training =  0.5494826014737968
Average Performance in Validation =  0.48129288341055876
----------------------------------------------------

M Value =  4
```

```
Lambda Value =  0.24

Fold  1
Performance Training =  0.534536360919627
Performance Validation =  0.5195473479650767

Fold  2
Performance Training =  0.5119574595516045
Performance Validation =  0.6156692964756983

Fold  3
Performance Training =  0.5130044987533902
Performance Validation =  0.4290936811038403

Fold  4
Performance Training =  0.6305470184890214
Performance Validation =  0.35011637294344344

Average Performance in Training =  0.5475113344284108
Average Performance in Validation =  0.4786066746220148
-----------------------------------------------------

M Value =  4
Lambda Value =  0.25

Fold  1
Performance Training =  0.5327700787845686
Performance Validation =  0.5154122890394083

Fold  2
Performance Training =  0.5099982885277774
Performance Validation =  0.6128834445304389

Fold  3
Performance Training =  0.5110254140664989
Performance Validation =  0.4262227171029047

Fold  4
Performance Training =  0.6286008513721105
Performance Validation =  0.34946466002411947

Average Performance in Training =  0.5455986581877389
Average Performance in Validation =  0.47599577767421786
-----------------------------------------------------

M Value =  4
Lambda Value =  0.26

Fold  1
Performance Training =  0.5310618808181978
Performance Validation =  0.5113761647078874

Fold  2
Performance Training =  0.5081031407193577
Performance Validation =  0.6101598598583264
```

Fold  3
Performance Training =  0.5090986564453135
Performance Validation =  0.42343257352977204


Fold  4
Performance Training =  0.6266920730493144
Performance Validation =  0.34884571761697825


Average Performance in Training =  0.5437389377580458
Average Performance in Validation =  0.473453578928241
-----------------------------------------------------

M Value =  4
Lambda Value =  0.27

Fold  1
Performance Training =  0.529406338365632
Performance Validation =  0.507432343479262


Fold  2
Performance Training =  0.5062662846752488
Performance Validation =  0.6074942757127908


Fold  3
Performance Training =  0.5072193364229552
Performance Validation =  0.4207163655766536


Fold  4
Performance Training =  0.624817509090034
Performance Validation =  0.34825466528728444


Average Performance in Training =  0.5419273671384675
Average Performance in Validation =  0.4709744125139977
-----------------------------------------------------

M Value =  4
Lambda Value =  0.28

Fold  1
Performance Training =  0.5277987808850106
Performance Validation =  0.5035750609741925


Fold  2
Performance Training =  0.504482778887422
Performance Validation =  0.6048829978646384


Fold  3
Performance Training =  0.5053832741367628
Performance Validation =  0.4180681233947804


Fold  4
Performance Training =  0.6229744692562682
Performance Validation =  0.3476874090237403


Average Performance in Training =  0.5401598257913659
Average Performance in Validation =  0.4685533978143379

```
---------------------------------------------------
M Value =  4
Lambda Value =  0.29

Fold  1
Performance Training =  0.5262351696267791
Performance Validation =  0.49979927767351406

Fold  2
Performance Training =  0.5027483404200443
Performance Validation =  0.6023228079488484

Fold  3
Performance Training =  0.5035868792335805
Performance Validation =  0.4154826433890353

Fold  4
Performance Training =  0.6211606630586948
Performance Validation =  0.34714050432813515

Average Performance in Training =  0.5384327630847747
Average Performance in Validation =  0.4661863083348833
---------------------------------------------------
M Value =  4
Lambda Value =  0.3

Fold  1
Performance Training =  0.5247119952029384
Performance Validation =  0.49610056287096815

Fold  2
Performance Training =  0.5010592383614134
Performance Validation =  0.5998108851697842

Fold  3
Performance Training =  0.5018270535667542
Performance Validation =  0.4129553672677233

Fold  4
Performance Training =  0.619374131473927
Performance Validation =  0.3466110456474123

Average Performance in Training =  0.5367431046512583
Average Performance in Validation =  0.463869465238972
---------------------------------------------------
M Value =  4
Lambda Value =  0.31

Fold  1
Performance Training =  0.5232261940078977
Performance Validation =  0.4924749995243828

Fold  2
```

```
Performance Training =  0.4994122068746859
Performance Validation =  0.5973447425245648


Fold  3
Performance Training =  0.5001011118826173
Performance Validation =  0.41048228303830536


Fold  4
Performance Training =  0.6176131914278228
Performance Validation =  0.3460965765357418


Average Performance in Training =  0.535088176048256
Average Performance in Validation =  0.46159965040574863
------------------------------------------------------

M Value =  4
Lambda Value =  0.32

Fold  1
Performance Training =  0.5217750796226144
Performance Validation =  0.4889191058690787


Fold  2
Performance Training =  0.4978043738324911
Performance Validation =  0.594922174581341


Fold  3
Performance Training =  0.49840671680688287
Performance Validation =  0.40805984348235524


Fold  4
Performance Training =  0.6158763904297789
Performance Validation =  0.345595016248872


Average Performance in Training =  0.5334656401729418
Average Performance in Validation =  0.45937403504541174
------------------------------------------------------

M Value =  4
Lambda Value =  0.33

Fold  1
Performance Training =  0.5203562862078921
Performance Validation =  0.4854297705487194


Fold  2
Performance Training =  0.4962332019251664
Performance Validation =  0.5925412145092652


Fold  3
Performance Training =  0.4967418252733409
Performance Validation =  0.40568489864713275


Fold  4
Performance Training =  0.6141624693283803
Performance Validation =  0.3451045994523677
```

Average Performance in Training =  0.5318734456836949
Average Performance in Validation =  0.45719012078937127
----------------------------------------------------

M Value =  4
Lambda Value =  0.34

Fold  1
Performance Training =  0.5189677215516832
Performance Validation =  0.4820041987028957

Fold  2
Performance Training =  0.49469643981511247
Performance Validation =  0.59020009855781

Fold  3
Performance Training =  0.49510464416501143
Performance Validation =  0.4033546396492317

Fold  4
Performance Training =  0.6124703316019164
Performance Validation =  0.34462382646159684

Average Performance in Training =  0.530309784283431
Average Performance in Validation =  0.4550456908428835
----------------------------------------------------

M Value =  4
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.5176075279361488
Performance Validation =  0.47863986697895766

Fold  2
Performance Training =  0.4931920814293824
Performance Validation =  0.5878972365659028

Fold  3
Performance Training =  0.49349359341541565
Performance Validation =  0.4010665516624441

Fold  4
Performance Training =  0.6107990179353726
Performance Validation =  0.3441514219896157

Average Performance in Training =  0.5287730551790799
Average Performance in Validation =  0.45293876929923005
----------------------------------------------------

M Value =  4
Lambda Value =  0.36

Fold  1
Performance Training =  0.5162740493740372

Performance Validation =  0.4753344858460423

Fold  2
Performance Training =  0.4917183318810987
Performance Validation =  0.585631187376126

Fold  3
Performance Training =  0.4919072751837601
Performance Validation =  0.3988183744044934

Fold  4
Performance Training =  0.6091476850953804
Performance Validation =  0.3436863008059058

Average Performance in Training =  0.5272618353835691
Average Performance in Validation =  0.4508675871081419
--------------------------------------------------------

M Value =  4
Lambda Value =  0.37

Fold  1
Performance Training =  0.5149658040601656
Performance Validation =  0.47208596791013435

Fold  2
Performance Training =  0.4902735788181445
Performance Validation =  0.5834006382577265

Fold  3
Performance Training =  0.4903444480006408
Performance Validation =  0.39660806877937016

Fold  4
Performance Training =  0.6075155883158065
Performance Validation =  0.34322753903762304

Average Performance in Training =  0.5257748547986894
Average Performance in Validation =  0.4488305534962136
--------------------------------------------------------

M Value =  4
Lambda Value =  0.38

Fold  1
Performance Training =  0.5136814611140654
Performance Validation =  0.46889240118118947

Fold  2
Performance Training =  0.4888563682370307
Performance Validation =  0.5812043876204125

Fold  3
Performance Training =  0.4888040050008
Performance Validation =  0.39443378859795086

```
Fold  4
Performance Training =  0.6059020665634098
Performance Validation =  0.34277435010005974

Average Performance in Training =  0.5243109752288264
Average Performance in Validation =  0.44682623187490317
-------------------------------------------------------

M Value =  4
Lambda Value =  0.39

Fold  1
Performance Training =  0.5124198208700104
Performance Validation =  0.4657520264427186

Fold  2
Performance Training =  0.48746538398732253
Performance Validation =  0.5790413304407742

Fold  3
Performance Training =  0.48728495553166373
Performance Validation =  0.3922938565082401

Fold  4
Performance Training =  0.6043065301759334
Performance Validation =  0.34232606444217384

Average Performance in Training =  0.5228691726412324
Average Performance in Validation =  0.4448533194584767
-------------------------------------------------------

M Value =  4
Lambda Value =  0.4

Fold  1
Performance Training =  0.5111797981125089
Performance Validation =  0.46266321803264643

Fold  2
Performance Training =  0.48609943033969316
Performance Validation =  0.576910445933581

Fold  3
Performance Training =  0.48578640956202823
Performance Validation =  0.39018674343088944

Fold  4
Performance Training =  0.6027284504619543
Performance Validation =  0.34188211244960354

Average Performance in Training =  0.5214485221190461
Average Performance in Validation =  0.44291062996168007
-------------------------------------------------------

M Value =  4
Lambda Value =  0.41000000000000003
```

```
Fold  1
Performance Training =  0.5099604077676878
Performance Validation =  0.45962446747073304

Fold  2
Performance Training =  0.4847574171076915
Performance Validation =  0.5748107870877949

Fold  3
Performance Training =  0.4843075644227234
Performance Validation =  0.3881110509259659

Fold  4
Performance Training =  0.601167350928728
Performance Validation =  0.34144200997134544

Average Performance in Training =  0.5200481850567077
Average Performance in Validation =  0.4409970788639598
---------------------------------------------------

M Value =  4
Lambda Value =  0.42

Fold  1
Performance Training =  0.5087607526504758
Performance Validation =  0.4566343694693

Fold  2
Performance Training =  0.4834383469065481
Performance Validation =  0.5727414717570273

Fold  3
Performance Training =  0.48284769349672196
Performance Validation =  0.38606549602104634

Fold  4
Performance Training =  0.5996227998655907
Performance Validation =  0.34100534603470967

Average Performance in Training =  0.5186673982298342
Average Performance in Validation =  0.4391116708205208
---------------------------------------------------

M Value =  4
Lambda Value =  0.43

Fold  1
Performance Training =  0.5075800129391539
Performance Validation =  0.453691609945824

Fold  2
Performance Training =  0.4821413042070003
Performance Validation =  0.5707016750501419

Fold  3
```

```
Performance Training =  0.4814061365474074
Performance Validation =  0.38404889811389276


Fold  4
Performance Training =  0.5980944040596265
Performance Validation =  0.3405717723918054


Average Performance in Training =  0.5173054644376304
Average Performance in Validation =  0.4372534888754298
------------------------------------------------------


M Value =  4
Lambda Value =  0.44


Fold  1
Performance Training =  0.5064174371064918
Performance Validation =  0.45079495572209516


Fold  2
Performance Training =  0.48086544590223057
Performance Validation =  0.5686906228128095


Fold  3
Performance Training =  0.4799822914075911
Performance Validation =  0.38206016763036343


Fold  4
Performance Training =  0.5965818034598758
Performance Validation =  0.3401409946044778


Average Performance in Training =  0.5159617444690473
Average Performance in Validation =  0.43542168519243646
------------------------------------------------------


M Value =  4
Lambda Value =  0.45


Fold  1
Performance Training =  0.5052723340833187
Performance Validation =  0.4479432456484901


Fold  2
Performance Training =  0.47960999315460784
Performance Validation =  0.5667075860272898


Fold  3
Performance Training =  0.47857560687119394
Performance Validation =  0.3800982961724565


Fold  4
Performance Training =  0.5950846666383832
Performance Validation =  0.33971276442412557


Average Performance in Training =  0.514635650186876
Average Performance in Validation =  0.4336154730680905
------------------------------------------------------
```

```
M Value =  4
Lambda Value =  0.46

Fold  1
Performance Training =  0.5041440664682635
Performance Validation =  0.4451353829357697

Fold  2
Performance Training =  0.4783742243284108
Performance Validation =  0.564751875987302

Fold  3
Performance Training =  0.47718557651644056
Performance Validation =  0.3781623479357521

Fold  4
Performance Training =  0.5936026869223611
Performance Validation =  0.33928687326734264

Average Performance in Training =  0.513326638558869
Average Performance in Validation =  0.43183412003154165
------------------------------------------------------

M Value =  4
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.5030320446282842
Performance Validation =  0.4423703285127628

Fold  2
Performance Training =  0.477157468846921
Performance Validation =  0.5628228401290135

Fold  3
Performance Training =  0.4758117334057008
Performance Validation =  0.3762514522116942

Fold  4
Performance Training =  0.5921355790929614
Performance Validation =  0.33886314661819383

Average Performance in Training =  0.5120342064934669
Average Performance in Validation =  0.4300769418679161
------------------------------------------------------

M Value =  4
Lambda Value =  0.48

Fold  1
Performance Training =  0.5019357215599528
Performance Validation =  0.43964709525788126

Fold  2
Performance Training =  0.4759591018386642
```

Performance Validation =  0.5609198584189122


Fold  3
Performance Training =  0.4744536454820134
Performance Validation =  0.37436479681979373


Fold  4
Performance Training =  0.5906830765635023
Performance Validation =  0.3384414392186331


Average Performance in Training =  0.5107578863610331
Average Performance in Validation =  0.42834329742880506
------------------------------------------------------

M Value =  4
Lambda Value =  0.49

Fold  1
Performance Training =  0.5008545884022576
Performance Validation =  0.4369647429767404


Fold  2
Performance Training =  0.47477853945928183
Performance Validation =  0.5590423402155702


Fold  3
Performance Training =  0.4731109115769534
Performance Validation =  0.37250162233936734


Fold  4
Performance Training =  0.5892449289642645
Performance Validation =  0.33802163092969284


Average Performance in Training =  0.5094972421006894
Average Performance in Validation =  0.42663258411534266
------------------------------------------------------

M Value =  4
Lambda Value =  0.5

Fold  1
Performance Training =  0.4997881705089092
Performance Validation =  0.43432237401837936


Fold  2
Performance Training =  0.47361523479342726
Performance Validation =  0.5571897215356681


Fold  3
Performance Training =  0.471783157939639
Performance Validation =  0.37066121703064014


Fold  4
Performance Training =  0.5878209000727257
Performance Validation =  0.33760362316520864

```
Average Performance in Training =  0.5082518658286752
Average Performance in Validation =  0.4249442339374741
------------------------------------------------------

M Value =  4
Lambda Value =  0.51

Fold  1
Performance Training =  0.4987360240023664
Performance Validation =  0.43171912943927593

Fold  2
Performance Training =  0.47246867425592254
Performance Validation =  0.5553614626657184

Fold  3
Performance Training =  0.4704700352129676
Performance Validation =  0.36884291235178246

Fold  4
Performance Training =  0.5864107660378377
Performance Validation =  0.3371873358152423

Average Performance in Training =  0.5070213748772736
Average Performance in Validation =  0.42327771006800474
------------------------------------------------------

M Value =  4
Lambda Value =  0.52

Fold  1
Performance Training =  0.49769773274365525
Performance Validation =  0.42915418563832197

Fold  2
Performance Training =  0.4713383744237537
Performance Validation =  0.5535570460700874

Fold  3
Performance Training =  0.4691712157945438
Performance Validation =  0.36704607899258657

Fold  4
Performance Training =  0.5850143138550242
Performance Validation =  0.33677270458921427

Average Performance in Training =  0.5058054092042442
Average Performance in Validation =  0.4216325038225526
------------------------------------------------------

M Value =  4
Lambda Value =  0.53

Fold  1
Performance Training =  0.4966729056619448
Performance Validation =  0.42662675139757567
```

Fold  2
Performance Training =  0.4702238792407649
Performance Validation =  0.5517759745535591

Fold  3
Performance Training =  0.46788639152918654
Performance Validation =  0.3652701233570542

Fold  4
Performance Training =  0.5836313400552994
Performance Validation =  0.33635967871943506

Average Performance in Training =  0.5046036291217989
Average Performance in Validation =  0.420008132006906
----------------------------------------------------

M Value =  4
Lambda Value =  0.54

Fold  1
Performance Training =  0.4956611743961038
Performance Validation =  0.4241360652733147

Fold  2
Performance Training =  0.4691247575455272
Performance Validation =  0.5500177696430386

Fold  3
Performance Training =  0.46661527168784156
Performance Validation =  0.3635144844370416

Fold  4
Performance Training =  0.582261649577512
Performance Validation =  0.33594821897467164

Average Performance in Training =  0.5034157133017462
Average Performance in Validation =  0.41840413458201664
----------------------------------------------------

M Value =  4
Lambda Value =  0.55

Fold  1
Performance Training =  0.49466219120742805
Performance Validation =  0.42168139329015986

Fold  2
Performance Training =  0.4680406008800784
Performance Validation =  0.5482819701583255

Fold  3
Performance Training =  0.4653575811943532
Performance Validation =  0.3617786310273994

Fold  4

Performance Training =  0.5809050547974266
Performance Validation =  0.33553829594085827

Average Performance in Training =  0.5022413570198215
Average Performance in Validation =  0.41682007260418574
-----------------------------------------------------

M Value =  4
Lambda Value =  0.56

Fold  1
Performance Training =  0.4936756271285604
Performance Validation =  0.4192620268978777

Fold  2
Performance Training =  0.46697102154331116
Performance Validation =  0.5465681309463633

Fold  3
Performance Training =  0.4641130590671436
Performance Validation =  0.3600620592399435

Fold  4
Performance Training =  0.5795613746912827
Performance Validation =  0.33512988853236325

Average Performance in Training =  0.5010802706075745
Average Performance in Validation =  0.41525552640413693
-----------------------------------------------------

M Value =  4
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.4927011703185773
Performance Validation =  0.4168772811563306

Fold  2
Performance Training =  0.46591565085791786
Performance Validation =  0.5448758217571062

Fold  3
Performance Training =  0.4628814570475517
Performance Validation =  0.35836429027952776

Fold  4
Performance Training =  0.5782304341147964
Performance Validation =  0.33472298270251344

Average Performance in Training =  0.4999321780847108
Average Performance in Validation =  0.4137100939738695
-----------------------------------------------------

M Value =  4
Lambda Value =  0.58

Fold  1
Performance Training =  0.4917385245983825
Performance Validation =  0.41452649311891077

Fold  2
Performance Training =  0.464874137624143
Performance Validation =  0.543204626242344

Fold  3
Performance Training =  0.46166253839059235
Performance Validation =  0.35668486845053626

Fold  4
Performance Training =  0.5769120631813623
Performance Validation =  0.3343175703265656

Average Performance in Training =  0.49879681594862
Average Performance in Validation =  0.4121833895345891
------------------------------------------------------

M Value =  4
Lambda Value =  0.59

Fold  1
Performance Training =  0.49078740814412125
Performance Validation =  0.41220902038902474

Fold  2
Performance Training =  0.4638461467372804
Performance Validation =  0.5415541410614714

Fold  3
Performance Training =  0.46045607679724976
Performance Validation =  0.35502335936625773

Fold  4
Performance Training =  0.5756060967255705
Performance Validation =  0.33391364823410263

Average Performance in Training =  0.4976739321010555
Average Performance in Validation =  0.4106750422627141
------------------------------------------------------

M Value =  4
Lambda Value =  0.6

Fold  1
Performance Training =  0.4898475523193242
Performance Validation =  0.409924239827683

Fold  2
Performance Training =  0.46283135794898067
Performance Validation =  0.5399239750804714

Fold  3
Performance Training =  0.4592618554703274

Performance Validation =  0.35337934833739104


Fold  4
Performance Training =  0.574312373840167
Performance Validation =  0.3335112173710518


Average Performance in Training =  0.4965632848946998
Average Performance in Validation =  0.40918469515414935
------------------------------------------------------

M Value =  4
Lambda Value =  0.61


Fold  1
Performance Training =  0.4889187006290806
Performance Validation =  0.4076715463932933


Fold  2
Performance Training =  0.461829464755112
Performance Validation =  0.5383137486523113


Fold  3
Performance Training =  0.45807966627829755
Performance Validation =  0.3517524389188855


Fold  4
Performance Training =  0.5730307374762647
Performance Validation =  0.3331102820742672


Average Performance in Training =  0.49546464228468867
Average Performance in Validation =  0.4077120040096893
------------------------------------------------------

M Value =  4
Lambda Value =  0.62


Fold  1
Performance Training =  0.48800060778174825
Performance Validation =  0.40545035209733615


Fold  2
Performance Training =  0.46084017339519356
Performance Validation =  0.5367230929685618


Fold  3
Performance Training =  0.4569093090137052
Performance Validation =  0.35014225159711454


Fold  4
Performance Training =  0.5717610340980788
Performance Validation =  0.3327108494439479


Average Performance in Training =  0.49437778107218144
Average Performance in Validation =  0.4062566365267401
------------------------------------------------------

```
M Value =  4
Lambda Value =  0.63

Fold  1
Performance Training =  0.4870930388455831
Performance Validation =  0.4032600850617629

Fold  2
Performance Training =  0.4598632019503861
Performance Validation =  0.5351516494734747

Fold  3
Performance Training =  0.4557505907344661
Performance Validation =  0.3485484226015789

Fold  4
Performance Training =  0.5705031133846679
Performance Validation =  0.3323129288011687

Average Performance in Training =  0.4933024862287758
Average Performance in Validation =  0.40481827148449634
------------------------------------------------------

M Value =  4
Lambda Value =  0.64

Fold  1
Performance Training =  0.48619576848930135
Performance Validation =  0.4011001886658947

Fold  2
Performance Training =  0.45889827952869156
Performance Validation =  0.5335990693329142

Fold  3
Performance Training =  0.4546033251779297
Performance Validation =  0.3469706028273678

Fold  4
Performance Training =  0.569256827972227
Performance Validation =  0.33191653121950215

Average Performance in Training =  0.4922385502920374
Average Performance in Validation =  0.4033965980114197
------------------------------------------------------

M Value =  4
Lambda Value =  0.65

Fold  1
Performance Training =  0.48530858029698587
Performance Validation =  0.398970120772158

Fold  2
Performance Training =  0.45794514552746535
Performance Validation =  0.5320650129515807
```

```
Fold  3
Performance Training =  0.45346733223890456
Performance Validation =  0.3454084568562683

Fold  4
Performance Training =  0.5680220332313678
Performance Validation =  0.3315216691211832

Average Performance in Training =  0.4911857728236809
Average Performance in Validation =  0.4019913149252976
------------------------------------------------------

M Value =  4
Lambda Value =  0.66

Fold  1
Performance Training =  0.48443126614894083
Performance Validation =  0.3968693530214321

Fold  2
Performance Training =  0.45700354896458295
Performance Validation =  0.5305491495328172

Fold  3
Performance Training =  0.4523424375039722
Performance Validation =  0.3438616620659112

Fold  4
Performance Training =  0.5667985870745927
Performance Validation =  0.3311283559295225

Average Performance in Training =  0.4901439599230222
Average Performance in Validation =  0.40060213013742074
------------------------------------------------------

M Value =  4
Lambda Value =  0.67

Fold  1
Performance Training =  0.4835636256611525
Performance Validation =  0.3947973701899349

Fold  2
Performance Training =  0.45607324787068604
Performance Validation =  0.5290511566760531

Fold  3
Performance Training =  0.45122847183540626
Performance Validation =  0.3423299078176124

Fold  4
Performance Training =  0.5655863497898233
Performance Validation =  0.3307366057703688

Average Performance in Training =  0.489112923789267
```

Average Performance in Validation =  0.3992287601134923
-----------------------------------------------------

M Value =  4
Lambda Value =  0.68

Fold  1
Performance Training =  0.4827054656769032
Performance Validation =  0.3927536696006436

Fold  2
Performance Training =  0.455154008735851
Performance Validation =  0.5275707200075724

Fold  3
Performance Training =  0.4501252709988406
Performance Validation =  0.3408128947146605

Fold  4
Performance Training =  0.5643851838964123
Performance Validation =  0.33034643321634327

Average Performance in Training =  0.48809248232700175
Average Performance in Validation =  0.39787092938480495
-----------------------------------------------------

M Value =  4
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.4818565998048764
Performance Validation =  0.39073776058310095

Fold  2
Performance Training =  0.45424560600483865
Performance Validation =  0.5261075328408498

Fold  3
Performance Training =  0.4490326753295856
Performance Validation =  0.3393103339238036

Fold  4
Performance Training =  0.5631949540205556
Performance Validation =  0.32995785306839387

Average Performance in Training =  0.48708245878996403
Average Performance in Validation =  0.3965283701040371
-----------------------------------------------------

M Value =  4
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.4810168479987569
Performance Validation =  0.38874916397625536

```
Fold  2
Performance Training =  0.45334782161578113
Performance Validation =  0.5246612958631877


Fold  3
Performance Training =  0.447950529433112
Performance Validation =  0.33782194655348763


Fold  4
Performance Training =  0.5620155267874309
Performance Validation =  0.3295708801698993


Average Performance in Training =  0.48608268145877026
Average Performance in Validation =  0.3952008216407075
-------------------------------------------------------

M Value =  4
Lambda Value =  0.71

Fold  1
Performance Training =  0.4801860361739382
Performance Validation =  0.38678741166962893


Fold  2
Performance Training =  0.45246044457776446
Performance Validation =  0.5232317168457741


Fold  3
Performance Training =  0.4468786819157692
Performance Validation =  0.33634746308314967


Fold  4
Performance Training =  0.5608467707277591
Performance Validation =  0.3291855292491743


Average Performance in Training =  0.48509298334880774
Average Performance in Validation =  0.39388803021193175
-------------------------------------------------------

M Value =  4
Lambda Value =  0.72

Fold  1
Performance Training =  0.4793639958574424
Performance Validation =  0.38485204617870317


Fold  2
Performance Training =  0.4515832705833065
Performance Validation =  0.5218185103746702


Fold  3
Performance Training =  0.4458169851423014
Performance Validation =  0.334886622838524


Fold  4
Performance Training =  0.559688556196789
```

Performance Validation =  0.3288018147867421

Average Performance in Training =  0.4841132019449598
Average Performance in Validation =  0.3925897485446599
-------------------------------------------------------

M Value =  4
Lambda Value =  0.73

Fold  1
Performance Training =  0.4785505638676325
Performance Validation =  0.38294262025089454

Fold  2
Performance Training =  0.4507161016521851
Performance Validation =  0.5204213976005211

Fold  3
Performance Training =  0.4447652950171239
Performance Validation =  0.33343917350847785

Fold  4
Performance Training =  0.5585407553039761
Performance Validation =  0.3284197509042024

Average Performance in Training =  0.4831431789602294
Average Performance in Validation =  0.39130573556602394
-------------------------------------------------------

M Value =  4
Lambda Value =  0.74

Fold  1
Performance Training =  0.4777455820206631
Performance Validation =  0.38105869649895185

Fold  2
Performance Training =  0.4498587458034775
Performance Validation =  0.5190401060050631

Fold  3
Performance Training =  0.4437234707866965
Performance Validation =  0.332004870699355

Fold  4
Performance Training =  0.5574032418518606
Performance Validation =  0.32803935127191874

Average Performance in Training =  0.4821827601156744
Average Performance in Validation =  0.39003575611882213
-------------------------------------------------------

M Value =  4
Lambda Value =  0.75

Fold  1

```
Performance Training =  0.47694889686098607
Performance Validation =  0.37919984705896426


Fold  2
Performance Training =  0.44901101675302935
Performance Validation =  0.5176743691827266


Fold  3
Performance Training =  0.44269137486064325
Performance Validation =  0.33058347752328965


Fold  4
Performance Training =  0.5562758912828458
Performance Validation =  0.3276606290330949


Average Performance in Training =  0.4812317949393761
Average Performance in Validation =  0.3887795806995188
-----------------------------------------------------

M Value =  4
Lambda Value =  0.76


Fold  1
Performance Training =  0.4761603594135094
Performance Validation =  0.37736565327051586


Fold  2
Performance Training =  0.44817273363387844
Performance Validation =  0.5163239266358559


Fold  3
Performance Training =  0.4416688726495491
Performance Validation =  0.32917476421730407


Fold  4
Performance Training =  0.5551585806327558
Performance Validation =  0.32728359674211294


Average Performance in Training =  0.48029013658242314
Average Performance in Validation =  0.3875369852164472
-----------------------------------------------------

M Value =  4
Lambda Value =  0.77


Fold  1
Performance Training =  0.47537982495528563
Performance Validation =  0.37555570537681116


Fold  2
Performance Training =  0.44734372073743744
Performance Validation =  0.5149885235822063


Fold  3
Performance Training =  0.44065583241760564
Performance Validation =  0.3277785077903559
```

```
Fold  4
Performance Training =  0.554051188490196
Performance Validation =  0.3269082663152666

Average Performance in Training =  0.47935764165013117
Average Performance in Validation =  0.38630775076616
------------------------------------------------------

M Value =  4
Lambda Value =  0.78

Fold  1
Performance Training =  0.47460715280483556
Performance Validation =  0.37376960224283784

Fold  2
Performance Training =  0.44652380727346763
Performance Validation =  0.5136679107735755

Fold  3
Performance Training =  0.43965212514848395
Performance Validation =  0.3263944916957703

Fold  4
Performance Training =  0.5529535949608846
Performance Validation =  0.32653464899225504

Average Performance in Training =  0.4784341700469179
Average Performance in Validation =  0.3850916634261097
------------------------------------------------------

M Value =  4
Lambda Value =  0.79

Fold  1
Performance Training =  0.47384220612741323
Performance Validation =  0.3720069510898639

Fold  2
Performance Training =  0.44571282714710314
Performance Validation =  0.5123618443245309

Fold  3
Performance Training =  0.43865762442302036
Performance Validation =  0.3250225055268293

Fold  4
Performance Training =  0.5518656816362125
Performance Validation =  0.3261627553070042

Average Performance in Training =  0.47751958483343737
Average Performance in Validation =  0.38388851406205704
------------------------------------------------------

M Value =  4
```

```
Lambda Value =  0.8

Fold  1
Performance Training =  0.4730848517547147
Performance Validation =  0.3702673672447667

Fold  2
Performance Training =  0.4449106187513635
Performance Validation =  0.5110700855503247

Fold  3
Performance Training =  0.4376722063074314
Performance Validation =  0.3236623447333902

Fold  4
Performance Training =  0.5507873315654155
Performance Validation =  0.32579259506655645

Average Performance in Training =  0.4766137520947313
Average Performance in Validation =  0.38269809814875955
-----------------------------------------------------

M Value =  4
Lambda Value =  0.81

Fold  1
Performance Training =  0.4723349600176747
Performance Validation =  0.36855047390283446

Fold  2
Performance Training =  0.44411702477374837
Performance Validation =  0.5097924008131867

Fold  3
Performance Training =  0.43669574925095767
Performance Validation =  0.3223138103577893

Fold  4
Performance Training =  0.5497184292308022
Performance Validation =  0.3254241773369262

Average Performance in Training =  0.47571654081829573
Average Performance in Validation =  0.3815202156026842
-----------------------------------------------------

M Value =  4
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.4715924045911516
Performance Validation =  0.36685590190287043

Fold  2
Performance Training =  0.443331892015674
Performance Validation =  0.5085285613762787
```

```
Fold  3
Performance Training =  0.43572813399192556
Performance Validation =  0.320976708788303


Fold  4
Performance Training =  0.5486588605255773
Performance Validation =  0.32505751043495246


Average Performance in Training =  0.4748278227810821
Average Performance in Validation =  0.38035467062560113
----------------------------------------------------

M Value =  4
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.4708570623494184
Performance Validation =  0.3651832895135203


Fold  2
Performance Training =  0.4425550712236246
Performance Validation =  0.5072783432646701


Fold  3
Performance Training =  0.43476924347136015
Performance Validation =  0.31965085152872164


Fold  4
Performance Training =  0.5476085127338425
Performance Validation =  0.3246926019252998


Average Performance in Training =  0.47394747244456137
Average Performance in Validation =  0.379201271558053
----------------------------------------------------

M Value =  4
Lambda Value =  0.84

Fold  1
Performance Training =  0.470128813231495
Performance Validation =  0.3635322822298904


Fold  2
Performance Training =  0.44178641693100384
Performance Validation =  0.506041527132767


Fold  3
Performance Training =  0.4338189627533574
Performance Validation =  0.3183360549826598


Fold  4
Performance Training =  0.5465672745124377
Performance Validation =  0.3243294586218606


Average Performance in Training =  0.4730753668570735
Average Performance in Validation =  0.37805983074179444
```

---------------------------------------------------

M Value =  4
Lambda Value =  0.85

Fold  1
Performance Training =  0.4694075401154517
Performance Validation =  0.36190253257960736

Fold  2
Performance Training =  0.44102578730979325
Performance Validation =  0.5048178981376847

Fold  3
Performance Training =  0.4328771789515241
Performance Validation =  0.31703214025142423

Fold  4
Performance Training =  0.5455350358743078
Performance Validation =  0.3239680865929072

Average Performance in Training =  0.47221138556276926
Average Performance in Validation =  0.37693016439040594
---------------------------------------------------

M Value =  4
Lambda Value =  0.86

Fold  1
Performance Training =  0.4686931287008953
Performance Validation =  0.36029369993756377

Fold  2
Performance Training =  0.4402730440311886
Performance Validation =  0.5036072458181056

Fold  3
Performance Training =  0.4319437811608656
Performance Validation =  0.31573893294429667

Fold  4
Performance Training =  0.5445116881731462
Performance Validation =  0.32360849116942014

Average Performance in Training =  0.4713554105165239
Average Performance in Validation =  0.37581209246734654
---------------------------------------------------

M Value =  4
Lambda Value =  0.87

Fold  1
Performance Training =  0.4679854673989515
Performance Validation =  0.3587054503486853

Fold  2

```
Performance Training =  0.4395280521344842
Performance Validation =  0.5024093639782226


Fold  3
Performance Training =  0.4310186603945727
Performance Validation =  0.3144562630002793


Fold  4
Performance Training =  0.5434971240890862
Performance Validation =  0.32325067695608867


Average Performance in Training =  0.47050732600427364
Average Performance in Validation =  0.37470543857081895
------------------------------------------------------

M Value =  4
Lambda Value =  0.88

Fold  1
Performance Training =  0.4672844472290909
Performance Validation =  0.357137456358099


Fold  2
Performance Training =  0.43879067990354004
Performance Validation =  0.5012240505763965


Fold  3
Performance Training =  0.4301017095252153
Performance Validation =  0.313183964520389


Fold  4
Performance Training =  0.5424912376152538
Performance Validation =  0.3228946478445468


Average Performance in Training =  0.469667018568275
Average Performance in Validation =  0.3736100298248578
------------------------------------------------------

M Value =  4
Lambda Value =  0.89

Fold  1
Performance Training =  0.4665899617222402
Performance Validation =  0.3555893968481767


Fold  2
Performance Training =  0.43806079875023185
Performance Validation =  0.5000511076181992


Fold  3
Performance Training =  0.4291928232299086
Performance Validation =  0.3119218756096539


Fold  4
Performance Training =  0.5414939240450143
Performance Validation =  0.3225404070284559
```

Average Performance in Training =  0.4688343769368487
Average Performance in Validation =  0.3725256967761214
----------------------------------------------------

M Value =  4
Lambda Value =  0.9

Fold  1
Performance Training =  0.46590190682965793
Performance Validation =  0.35406095688194994

Fold  2
Performance Training =  0.4373382831043353
Performance Validation =  0.4988903410535468

Fold  3
Performance Training =  0.42829189793905975
Performance Validation =  0.31066983822811767

Fold  4
Performance Training =  0.5405050799597797
Performance Validation =  0.3221879570201013

Average Performance in Training =  0.4680092919582082
Average Performance in Validation =  0.3714522732959289
----------------------------------------------------

M Value =  4
Lambda Value =  0.91

Fold  1
Performance Training =  0.4652201808371087
Performance Validation =  0.3525518275524703

Fold  2
Performance Training =  0.4366230103093599
Performance Validation =  0.4977415606776572

Fold  3
Performance Training =  0.42739883178834714
Performance Validation =  0.3094276980501338

Fold  4
Performance Training =  0.5395246032172536
Performance Validation =  0.32183729966820696

Average Performance in Training =  0.4671916565380173
Average Performance in Validation =  0.3703895964871171
----------------------------------------------------

M Value =  4
Lambda Value =  0.92

Fold  1
Performance Training =  0.4645446842839145

Performance Validation =  0.3510617058377081

Fold  2
Performance Training =  0.43591486052387773
Performance Validation =  0.4966045800355885

Fold  3
Performance Training =  0.426513524573628
Performance Validation =  0.308195304331358

Fold  4
Performance Training =  0.5385523929400191
Performance Validation =  0.32148843617671086

Average Performance in Training =  0.46638136558035986
Average Performance in Validation =  0.36933750659534137
----------------------------------------------------

M Value =  4
Lambda Value =  0.93

Fold  1
Performance Training =  0.4638753198864978
Performance Validation =  0.34959029446063683

Fold  2
Performance Training =  0.4352137166279466
Performance Validation =  0.4954792163301369

Fold  3
Performance Training =  0.425635877708488
Performance Validation =  0.3069725097828704

Fold  4
Performance Training =  0.5375883495043832
Performance Validation =  0.3211413671242789

Average Performance in Training =  0.46557831593182886
Average Performance in Validation =  0.36829584692448075
----------------------------------------------------

M Value =  4
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.46321199246607625
Performance Validation =  0.348137301754177

Fold  2
Performance Training =  0.4345194641342557
Performance Validation =  0.49436529033290266

Fold  3
Performance Training =  0.4247657941841897
Performance Validation =  0.3057591704519108

```
Fold  4
Performance Training =  0.5366323745294055
Performance Validation =  0.320796092484364

Average Performance in Training =  0.4647824063284818
Average Performance in Validation =  0.3672644637558386
------------------------------------------------------

M Value =  4
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.4625546088801854
Performance Validation =  0.3467024415307055

Fold  2
Performance Training =  0.4338319911036559
Performance Validation =  0.4932626262983334

Fold  3
Performance Training =  0.4239031785318026
Performance Validation =  0.3045551456087584

Fold  4
Performance Training =  0.5356843708660587
Performance Validation =  0.3204526116456402

Average Performance in Training =  0.4639935373454256
Average Performance in Validation =  0.3662432062708594
------------------------------------------------------

M Value =  4
Lambda Value =  0.96

Fold  1
Performance Training =  0.46190307795775
Performance Validation =  0.34528543295586356

Fold  2
Performance Training =  0.43315118806477193
Performance Validation =  0.4921710518805855

Fold  3
Performance Training =  0.42304793678630714
Performance Validation =  0.3033602976393456

Fold  4
Performance Training =  0.5347442425864675
Performance Validation =  0.32011092343266756

Average Performance in Training =  0.4632116113488241
Average Performance in Validation =  0.36523192647711555
------------------------------------------------------

M Value =  4
Lambda Value =  0.97
```

```
Fold  1
Performance Training =  0.461257310437439
Performance Validation =  0.34388600042641737


Fold  2
Performance Training =  0.43247694793741265
Performance Validation =  0.49109039805305643


Fold  3
Performance Training =  0.4221999764525016
Performance Validation =  0.30217449194317947


Fold  4
Performance Training =  0.5338118949731877
Performance Validation =  0.31977102612665875


Average Performance in Training =  0.4624365324501353
Average Performance in Validation =  0.364230479137328
----------------------------------------------------

M Value =  4
Lambda Value =  0.98

Fold  1
Performance Training =  0.4606172189090717
Performance Validation =  0.3425038734519562


Fold  2
Performance Training =  0.4318091659595267
Performance Validation =  0.4900204990304393


Fold  3
Performance Training =  0.42135920647255065
Performance Validation =  0.3009975968362486


Fold  4
Performance Training =  0.532887234508497
Performance Validation =  0.31943291748624525


Average Performance in Training =  0.4616682064624115
Average Performance in Validation =  0.3632387217012223
----------------------------------------------------

M Value =  4
Lambda Value =  0.99

Fold  1
Performance Training =  0.4599827177578524
Performance Validation =  0.34113878654021


Fold  2
Performance Training =  0.431147739617464
Performance Validation =  0.4889611921931819


Fold  3
```

```
Performance Training =  0.4205255371950357
Performance Validation =  0.2998294834585562


Fold  4
Performance Training =  0.5319701688636673
Performance Validation =  0.31909659476814445


Average Performance in Training =  0.46090654085850485
Average Performance in Validation =  0.36225651424002314
------------------------------------------------------

M Value =  4
Lambda Value =  1.0


Fold  1
Performance Training =  0.45935372311124123
Performance Validation =  0.3397904790858255


Fold  2
Performance Training =  0.43049256857933627
Performance Validation =  0.4879123180142332


Fold  3
Performance Training =  0.4196988803453706
Performance Validation =  0.29867002568598777


Fold  4
Performance Training =  0.5310606068882016
Performance Validation =  0.31876205474765096


Average Performance in Training =  0.4601514447310374
Average Performance in Validation =  0.3612837193834243
------------------------------------------------------

M Value =  4
Lambda Value =  1.01


Fold  1
Performance Training =  0.45873015278827844
Performance Validation =  0.3384586952624029


Fold  2
Performance Training =  0.429843554631271
Performance Validation =  0.4868737199879638


Fold  3
Performance Training =  0.41887914899748113
Performance Validation =  0.2975191000462414


Fold  4
Performance Training =  0.5301584585990232
Performance Validation =  0.31842929373888607


Average Performance in Training =  0.4594028287540135
Average Performance in Validation =  0.3603202022588735
------------------------------------------------------
```

M Value =  4
Lambda Value =  1.02

Fold  1
Performance Training =  0.4581119262511967
Performance Validation =  0.33714318391765685

Fold  2
Performance Training =  0.4292006016163835
Performance Validation =  0.48584524456116773

Fold  3
Performance Training =  0.41806625754663207
Performance Validation =  0.2963765856385454

Fold  4
Performance Training =  0.5292636351695984
Performance Validation =  0.3180983076147481

Average Performance in Training =  0.45866060514595264
Average Performance in Validation =  0.35936583043302955
----------------------------------------------------

M Value =  4
Lambda Value =  1.03

Fold  1
Performance Training =  0.45749896455917194
Performance Validation =  0.33584369847154694

Fold  2
Performance Training =  0.4285636153763006
Performance Validation =  0.4848267410660514

Fold  3
Performance Training =  0.4172601216833187
Performance Validation =  0.2952423640569455

Fold  4
Performance Training =  0.5283760489189966
Performance Validation =  0.3177690918265149

Average Performance in Training =  0.45792468763444694
Average Performance in Validation =  0.35842047385526465
----------------------------------------------------

M Value =  4
Lambda Value =  1.04

Fold  1
Performance Training =  0.4568911903240709
Performance Validation =  0.3345599968172488

Fold  2
Performance Training =  0.4279325036950773

Performance Validation =  0.48381806165512276


Fold  3
Performance Training =  0.41646065836813206
Performance Validation =  0.29411631931692794


Fold  4
Performance Training =  0.5274956133008711
Performance Validation =  0.31744164142306286


Average Performance in Training =  0.4571949914220378
Average Performance in Validation =  0.3574840048030906
------------------------------------------------------

M Value =  4
Lambda Value =  1.05

Fold  1
Performance Training =  0.4562885276680717
Performance Validation =  0.333291841224838


Fold  2
Performance Training =  0.42730717624537407
Performance Validation =  0.48281906123790463


Fold  3
Performance Training =  0.4156677858075303
Performance Validation =  0.2929983377851918


Fold  4
Performance Training =  0.5266222428923698
Performance Validation =  0.3171159510696663


Average Performance in Training =  0.4564714331533365
Average Performance in Validation =  0.35655629782940024
------------------------------------------------------

M Value =  4
Lambda Value =  1.06

Fold  1
Performance Training =  0.4556909021830372
Performance Validation =  0.3320389982475812


Fold  2
Performance Training =  0.4266875445367527
Performance Validation =  0.4818295974193978


Fold  3
Performance Training =  0.41488142343044265
Performance Validation =  0.2918883081123672


Fold  4
Performance Training =  0.5257558533829695
Performance Validation =  0.31679201506635757

```
Average Performance in Training =  0.4557539308833005
Average Performance in Validation =  0.355637229711426
-------------------------------------------------------

M Value =  4
Lambda Value =  1.07

Fold  1
Performance Training =  0.4550982408915366
Performance Validation =  0.33080123863071453

Fold  2
Performance Training =  0.426073521865983
Performance Validation =  0.4808495304402204

Fold  3
Performance Training =  0.4141014918656454
Performance Validation =  0.29078612116851477

Fold  4
Performance Training =  0.5248963615632352
Performance Validation =  0.31646982736581997

Average Performance in Training =  0.45504240404660007
Average Performance in Validation =  0.3547266794013174
-------------------------------------------------------

M Value =  4
Lambda Value =  1.08

Fold  1
Performance Training =  0.4545104722094121
Performance Validation =  0.3295783372226253

Fold  2
Performance Training =  0.42546502326923763
Performance Validation =  0.4798787231183679

Fold  3
Performance Training =  0.4133279129198627
Performance Validation =  0.2896916699812593

Fold  4
Performance Training =  0.5240436853135124
Performance Validation =  0.31614938159080586

Average Performance in Training =  0.4543367734280062
Average Performance in Validation =  0.3538245279782646
-------------------------------------------------------

M Value =  4
Lambda Value =  1.09

Fold  1
Performance Training =  0.45392752590980434
Performance Validation =  0.32837007288833264
```

```
Fold  2
Performance Training =  0.42486196547607846
Performance Validation =  0.4789170407925255

Fold  3
Performance Training =  0.41256060955653084
Performance Validation =  0.28860484967637734

Fold  4
Performance Training =  0.5231977435925536
Performance Validation =  0.31583067105106355

Average Performance in Training =  0.45363696113374175
Average Performance in Validation =  0.35293065860207473
----------------------------------------------------

M Value =  5
Lambda Value =  0.01

Fold  1
Performance Training =  0.708009626269247
Performance Validation =  0.6042411791890612

Fold  2
Performance Training =  0.6856379997210095
Performance Validation =  0.7586991124864887

Fold  3
Performance Training =  0.6777898599559311
Performance Validation =  0.6409203621314984

Fold  4
Performance Training =  0.7516218236330682
Performance Validation =  0.5216080474901806

Average Performance in Training =  0.7057648273948139
Average Performance in Validation =  0.6313671753243073
----------------------------------------------------

M Value =  5
Lambda Value =  0.02

Fold  1
Performance Training =  0.6908855941575152
Performance Validation =  0.6545688507901972

Fold  2
Performance Training =  0.6697421839952237
Performance Validation =  0.75660675851715

Fold  3
Performance Training =  0.6639140774838483
Performance Validation =  0.6207153746859857

Fold  4
```

Performance Training =  0.7431634843324619
Performance Validation =  0.493743326870405

Average Performance in Training =  0.6919263349922622
Average Performance in Validation =  0.6314085777159344
----------------------------------------------------

M Value =  5
Lambda Value =  0.03

Fold  1
Performance Training =  0.6754874523600715
Performance Validation =  0.6748796215783381

Fold  2
Performance Training =  0.65590282180502
Performance Validation =  0.7509821696653276

Fold  3
Performance Training =  0.6515159740732571
Performance Validation =  0.6036601324611263

Fold  4
Performance Training =  0.7355752463963618
Performance Validation =  0.4739899074303294

Average Performance in Training =  0.6796203736586776
Average Performance in Validation =  0.6258779577837804
----------------------------------------------------

M Value =  5
Lambda Value =  0.04

Fold  1
Performance Training =  0.6624177960724255
Performance Validation =  0.6820359486939829

Fold  2
Performance Training =  0.6439822676089162
Performance Validation =  0.744520765415394

Fold  3
Performance Training =  0.6407658199462836
Performance Validation =  0.5891378849699739

Fold  4
Performance Training =  0.7288512817972674
Performance Validation =  0.45909560649088765

Average Performance in Training =  0.6690042913562231
Average Performance in Validation =  0.6186975513925597
----------------------------------------------------

M Value =  5
Lambda Value =  0.05

Fold  1
Performance Training =  0.6514240437764708
Performance Validation =  0.6831121856403036

Fold  2
Performance Training =  0.6337652468105037
Performance Validation =  0.7381350177299426

Fold  3
Performance Training =  0.6315287410681946
Performance Validation =  0.576696909685495

Fold  4
Performance Training =  0.7229435881572457
Performance Validation =  0.44748288211371745

Average Performance in Training =  0.6599154049531037
Average Performance in Validation =  0.6113567487923647
------------------------------------------------------

M Value =  5
Lambda Value =  0.06

Fold  1
Performance Training =  0.642121422996376
Performance Validation =  0.681238803790891

Fold  2
Performance Training =  0.624968243067654
Performance Validation =  0.732116549609341

Fold  3
Performance Training =  0.6235654044174596
Performance Validation =  0.5659268308412556

Fold  4
Performance Training =  0.7177417401069857
Performance Validation =  0.43820395822150804

Average Performance in Training =  0.6520992026471188
Average Performance in Validation =  0.6043715356157489
------------------------------------------------------

M Value =  5
Lambda Value =  0.07

Fold  1
Performance Training =  0.6341662574494573
Performance Validation =  0.6779026012684143

Fold  2
Performance Training =  0.6173288799414524
Performance Validation =  0.7265324909496252

Fold  3
Performance Training =  0.6166440566915887

```
Performance Validation =  0.556491859403446


Fold  4
Performance Training =  0.7131286899078288
Performance Validation =  0.43064287500254195


Average Performance in Training =  0.6453169709975818
Average Performance in Validation =  0.5978924566560069
------------------------------------------------------


M Value =  5
Lambda Value =  0.08


Fold  1
Performance Training =  0.6272835669054722
Performance Validation =  0.6738495323434022


Fold  2
Performance Training =  0.610629181152911
Performance Validation =  0.7213684517810497


Fold  3
Performance Training =  0.6105693392142764
Performance Validation =  0.5481287468611387


Fold  4
Performance Training =  0.7090006503767483
Performance Validation =  0.42437995926682615


Average Performance in Training =  0.6393706844123519
Average Performance in Validation =  0.5919316725631042
------------------------------------------------------


M Value =  5
Lambda Value =  0.09


Fold  1
Performance Training =  0.621260018406288
Performance Validation =  0.6694685638671041


Fold  2
Performance Training =  0.6046947265634481
Performance Validation =  0.7165829923343923


Fold  3
Performance Training =  0.6051839360766076
Performance Validation =  0.5406336189592822


Fold  4
Performance Training =  0.7052712289538536
Performance Validation =  0.41911916431866847


Average Performance in Training =  0.6341024775000493
Average Performance in Validation =  0.5864510848698617
------------------------------------------------------
```

```
M Value =  5
Lambda Value =  0.1

Fold  1
Performance Training =  0.6159310186210691
Performance Validation =  0.6649672928201311

Fold  2
Performance Training =  0.5993875460021914
Performance Validation =  0.7121288752821385

Fold  3
Performance Training =  0.6003629997042937
Performance Validation =  0.5338484466372685

Fold  4
Performance Training =  0.7018702419440681
Performance Validation =  0.4146457702996159

Average Performance in Training =  0.6293879515679055
Average Performance in Validation =  0.5813975962597885
------------------------------------------------------

M Value =  5
Lambda Value =  0.11

Fold  1
Performance Training =  0.6111690533143841
Performance Validation =  0.6604573253614208

Fold  2
Performance Training =  0.5945985583894111
Performance Validation =  0.7079611628743567

Fold  3
Performance Training =  0.5960076396616477
Performance Validation =  0.5276499377486534

Fold  4
Performance Training =  0.6987411385195093
Performance Validation =  0.4108004044743918

Average Performance in Training =  0.625129097471238
Average Performance in Validation =  0.5767172076147057
------------------------------------------------------

M Value =  5
Lambda Value =  0.12

Fold  1
Performance Training =  0.6068745431589829
Performance Validation =  0.6559978922489677

Fold  2
Performance Training =  0.5902411415609634
Performance Validation =  0.7040399413689258
```

Fold  3
Performance Training =  0.5920392380812896
Performance Validation =  0.52194104874729

Fold  4
Performance Training =  0.6958383864272408
Performance Validation =  0.407462429530387

Average Performance in Training =  0.6212483273071192
Average Performance in Validation =  0.5723603279738927
------------------------------------------------------

M Value =  5
Lambda Value =  0.13

Fold  1
Performance Training =  0.6029689915094315
Performance Validation =  0.651619042086574

Fold  2
Performance Training =  0.5862460524281425
Performance Validation =  0.7003308465780294

Fold  3
Performance Training =  0.5883949079432289
Performance Validation =  0.5166446591817315

Fold  4
Performance Training =  0.6931252205698102
Performance Validation =  0.40453896974735415

Average Performance in Training =  0.6176837931126533
Average Performance in Validation =  0.5682833793984222
------------------------------------------------------

M Value =  5
Lambda Value =  0.14

Fold  1
Performance Training =  0.5993899198763663
Performance Validation =  0.6473343787896144

Fold  2
Performance Training =  0.5825575247796266
Performance Validation =  0.6968047282826979

Fold  3
Performance Training =  0.5850239835770705
Performance Validation =  0.5116988873704913

Fold  4
Performance Training =  0.6905718191113766
Performance Validation =  0.4019574594152727

Average Performance in Training =  0.6143858118361101

Average Performance in Validation =  0.5644488634645191
------------------------------------------------------

M Value =  5
Lambda Value =  0.15

Fold  1
Performance Training =  0.5960871274232239
Performance Validation =  0.6431482363093672

Fold  2
Performance Training =  0.5791302995665248
Performance Validation =  0.6934370251491413

Fold  3
Performance Training =  0.581885340429952
Performance Validation =  0.5070536135065584

Fold  4
Performance Training =  0.6881538632474878
Performance Validation =  0.3996604613605397

Average Performance in Training =  0.6113141576667972
Average Performance in Validation =  0.5608248340814017
------------------------------------------------------

M Value =  5
Lambda Value =  0.16

Fold  1
Performance Training =  0.5930199140190313
Performance Validation =  0.639059797371127

Fold  2
Performance Training =  0.5759273661952148
Performance Validation =  0.6902070913419887

Fold  3
Performance Training =  0.57894535187764
Performance Validation =  0.5026678825068085

Fold  4
Performance Training =  0.6858514112249168
Performance Validation =  0.39760198819508974

Average Performance in Training =  0.6084360108292007
Average Performance in Validation =  0.5573841898537535
------------------------------------------------------

M Value =  5
Lambda Value =  0.17

Fold  1
Performance Training =  0.5901550022989748
Performance Validation =  0.6350654880420294

```
Fold  2
Performance Training =  0.5729182381421143
Performance Validation =  0.6870975707397922


Fold  3
Performance Training =  0.5761763268656956
Performance Validation =  0.4985079479079695


Fold  4
Performance Training =  0.6836480200352681
Performance Validation =  0.3957448418349401


Average Performance in Training =  0.6057243968355133
Average Performance in Validation =  0.5541039621311827
------------------------------------------------------

M Value =  5
Lambda Value =  0.18

Fold  1
Performance Training =  0.5874649686227482
Performance Validation =  0.631160378099064


Fold  2
Performance Training =  0.5700776286362268
Performance Validation =  0.684093850640091


Fold  3
Performance Training =  0.5735553085687892
Performance Validation =  0.49454578517232317


Fold  4
Performance Training =  0.6815300590745146
Performance Validation =  0.3940586574535103


Average Performance in Training =  0.6031569912255696
Average Performance in Validation =  0.5509646678412472
------------------------------------------------------

M Value =  5
Lambda Value =  0.19

Fold  1
Performance Training =  0.5849270470634775
Performance Validation =  0.627338998107652


Fold  2
Performance Training =  0.5673844264347809
Performance Validation =  0.6811835992851933


Fold  3
Performance Training =  0.5710631443653832
Performance Validation =  0.49075795124259425


Fold  4
Performance Training =  0.6794861716749208
```

Performance Validation =  0.3925184438709207

Average Performance in Training =  0.6007151973846406
Average Performance in Validation =  0.5479497481265901
-------------------------------------------------------

M Value =  5
Lambda Value =  0.2

Fold  1
Performance Training =  0.5825222091376945
Performance Validation =  0.6235958098355123

Fold  2
Performance Training =  0.5648208977662523
Performance Validation =  0.6783563805029478

Fold  3
Performance Training =  0.5686837605718057
Performance Validation =  0.4871247016673307

Fold  4
Performance Training =  0.6775068504752269
Performance Validation =  0.39110347968383896

Average Performance in Training =  0.5983834294877448
Average Performance in Validation =  0.5450450929224074
-------------------------------------------------------

M Value =  5
Lambda Value =  0.21

Fold  1
Performance Training =  0.5802344492126971
Performance Validation =  0.619925468902043

Fold  2
Performance Training =  0.5623720597944591
Performance Validation =  0.6756033351570614

Fold  3
Performance Training =  0.5664035926247917
Performance Validation =  0.4836293010441961

Fold  4
Performance Training =  0.6755841006457701
Performance Validation =  0.38979646820017555

Average Performance in Training =  0.5961485505694295
Average Performance in Validation =  0.542238643325869
-------------------------------------------------------

M Value =  5
Lambda Value =  0.22

Fold  1

```
Performance Training =  0.5780502247493216
Performance Validation =  0.61632296250359


Fold  2
Performance Training =  0.5600251850751636
Performance Validation =  0.6729169187452694


Fold  3
Performance Training =  0.5642111340820968
Performance Validation =  0.4802574798649414


Fold  4
Performance Training =  0.6737111712020207
Performance Validation =  0.3885828832689814


Average Performance in Training =  0.5939994287771506
Average Performance in Validation =  0.5395200610956956
-----------------------------------------------------

M Value =  5
Lambda Value =  0.23


Fold  1
Performance Training =  0.575958014170745
Performance Validation =  0.6127836722509884


Fold  2
Performance Training =  0.5577694067874817
Performance Validation =  0.6702906854285694


Fold  3
Performance Training =  0.5620965770974763
Performance Validation =  0.4769970032147125


Fold  4
Performance Training =  0.6718823393607942
Performance Validation =  0.38745045770132003


Average Performance in Training =  0.5919265843541243
Average Performance in Validation =  0.5368804546488977
-----------------------------------------------------

M Value =  5
Lambda Value =  0.24


Fold  1
Performance Training =  0.5739479648824815
Performance Validation =  0.6093033926283598


Fold  2
Performance Training =  0.555595402066042
Performance Validation =  0.6677191101329286


Fold  3
Performance Training =  0.5600515238337657
Performance Validation =  0.47383732566475545
```

```
Fold  4
Performance Training =  0.670092736452906
Performance Validation =  0.38638877944094774

Average Performance in Training =  0.5899219068087989
Average Performance in Validation =  0.5343121519667479
-----------------------------------------------------

M Value =  5
Lambda Value =  0.25

Fold  1
Performance Training =  0.5720116109750436
Performance Validation =  0.6058783237863964

Fold  2
Performance Training =  0.5534951363022241
Performance Validation =  0.6651974417457314

Fold  3
Performance Training =  0.558068753286263
Performance Validation =  0.4707693131326065

Fold  4
Performance Training =  0.6683382065853083
Performance Validation =  0.38538897003006356

Average Performance in Training =  0.5879784267872098
Average Performance in Validation =  0.5318085121736994
-----------------------------------------------------

M Value =  5
Lambda Value =  0.26

Fold  1
Performance Training =  0.5701416452262758
Performance Validation =  0.6025050501706612

Fold  2
Performance Training =  0.5514616553778201
Performance Validation =  0.6627215816766769

Fold  3
Performance Training =  0.5561420316930386
Performance Validation =  0.46778501718228904

Fold  4
Performance Training =  0.6666151912653524
Performance Validation =  0.3844434265516511

Average Performance in Training =  0.5860901308906217
Average Performance in Validation =  0.5293637688953196
-----------------------------------------------------

M Value =  5
```

Lambda Value =  0.27

Fold  1
Performance Training =  0.5683317337436712
Performance Validation =  0.5991805120317633

Fold  2
Performance Training =  0.549488915839438
Performance Validation =  0.6602879831187103

Fold  3
Performance Training =  0.5542659574655449
Performance Validation =  0.4648774906966887

Fold  4
Performance Training =  0.6649206347271306
Performance Validation =  0.38354561298272316

Average Performance in Training =  0.5842518104439461
Average Performance in Validation =  0.5269728997074713
----------------------------------------------------

M Value =  5
Lambda Value =  0.28

Fold  1
Performance Training =  0.5665763643364594
Performance Validation =  0.5959019740941186

Fold  2
Performance Training =  0.547571645301593
Performance Validation =  0.6578935672289796

Fold  3
Performance Training =  0.5524358336381013
Performance Validation =  0.46204063642274873

Fold  4
Performance Training =  0.6632519058599985
Performance Validation =  0.382689890337641

Average Performance in Training =  0.582458937284038
Average Performance in Validation =  0.524631517020872
----------------------------------------------------

M Value =  5
Lambda Value =  0.29

Fold  1
Performance Training =  0.5648707217547269
Performance Validation =  0.5926669939294125

Fold  2
Performance Training =  0.5457052270848793
Performance Validation =  0.6555356531715091

```
Fold  3
Performance Training =  0.5506475623924805
Performance Validation =  0.45926908181297577


Fold  4
Performance Training =  0.661606733525042
Performance Validation =  0.3818713775054804


Average Performance in Training =  0.5807075611892822
Average Performance in Validation =  0.5223357766048444
----------------------------------------------------

M Value =  5
Lambda Value =  0.3

Fold  1
Performance Training =  0.5632105844700583
Performance Validation =  0.5894733914981588


Fold  2
Performance Training =  0.5438856044000936
Performance Validation =  0.6532118995468958


Fold  3
Performance Training =  0.5488975573967476
Performance Validation =  0.4565580750372581


Fold  4
Performance Training =  0.659983152725108
Performance Validation =  0.38108583655521344


Average Performance in Training =  0.5789942247480019
Average Performance in Validation =  0.5200823006593815
----------------------------------------------------

M Value =  5
Lambda Value =  0.31

Fold  1
Performance Training =  0.5615922388354617
Performance Validation =  0.5863192206473016


Fold  2
Performance Training =  0.5421092003861226
Performance Validation =  0.6509202552040051


Fold  3
Performance Training =  0.5471826706019528
Performance Validation =  0.4539033981419006


Fold  4
Performance Training =  0.6583794596187491
Performance Validation =  0.38032957768059905


Average Performance in Training =  0.5773158923605717
Average Performance in Validation =  0.5178681129184516
```

```
-------------------------------------------------------
M Value =  5
Lambda Value =  0.32

Fold  1
Performance Training =  0.5600124073492859
Performance Validation =  0.5832027429335888

Fold  2
Performance Training =  0.5403728510764709
Performance Validation =  0.6486589178058002

Fold  3
Performance Training =  0.5455001308363989
Performance Validation =  0.4513012941774017

Fold  4
Performance Training =  0.6567941737757845
Performance Validation =  0.3795993800117615

Average Performance in Training =  0.575669890759485
Average Performance in Validation =  0.515690583732138
-------------------------------------------------------
M Value =  5
Lambda Value =  0.33

Fold  1
Performance Training =  0.5584681884290627
Performance Validation =  0.5801224038875242

Fold  2
Performance Training =  0.538673748963276
Performance Validation =  0.646426298824375

Fold  3
Performance Training =  0.543847492076458
Performance Validation =  0.4487484057679818

Fold  4
Performance Training =  0.6552260063901373
Performance Validation =  0.3788924253233604

Average Performance in Training =  0.5740538589647335
Average Performance in Validation =  0.5135473834508103
-------------------------------------------------------
M Value =  5
Lambda Value =  0.34

Fold  1
Performance Training =  0.556957005628038
Performance Validation =  0.5770768116813323

Fold  2
```

```
Performance Training =  0.5370093952905164
Performance Validation =  0.6442209938836229


Fold  3
Performance Training =  0.542222589693246
Performance Validation =  0.4462417231016218


Fold  4
Performance Training =  0.6536738334151897
Performance Validation =  0.3782062422852649


Average Performance in Training =  0.5724657060067475
Average Performance in Validation =  0.5114364427379604
------------------------------------------------------

M Value =  5
Lambda Value =  0.35000000000000003


Fold  1
Performance Training =  0.5554765646373271
Performance Validation =  0.574064718078712


Fold  2
Performance Training =  0.5353775595709608
Performance Validation =  0.6420417575640314


Fold  3
Performance Training =  0.5406235033041067
Performance Validation =  0.44377853971476033


Fold  4
Performance Training =  0.6521366727838713
Performance Validation =  0.3775386593778013


Average Performance in Training =  0.5709035750740665
Average Performance in Validation =  0.5093559186838262
------------------------------------------------------

M Value =  5
Lambda Value =  0.36


Fold  1
Performance Training =  0.5540248167379653
Performance Validation =  0.5710850014997201


Fold  2
Performance Training =  0.5337762451075254
Performance Validation =  0.6398874819422646


Fold  3
Performance Training =  0.5390485251178494
Performance Validation =  0.44135641475658904


Fold  4
Performance Training =  0.6506136650319236
Performance Validation =  0.3768877649643505
```

Average Performance in Training =  0.569365812998816
Average Performance in Validation =  0.507304165790731
------------------------------------------------------

M Value =  5
Lambda Value =  0.37

Fold  1
Performance Training =  0.5525999276204504
Performance Validation =  0.5681366520154812

Fold  2
Performance Training =  0.5322036595265451
Performance Validation =  0.6377571782662129

Fold  3
Performance Training =  0.5374961328689245
Performance Validation =  0.4389731406638008

Fold  4
Performance Training =  0.649104056767386
Performance Validation =  0.37625187330459653

Average Performance in Training =  0.5678509441958265
Average Performance in Validation =  0.5052797110625229
------------------------------------------------------

M Value =  5
Lambda Value =  0.38

Fold  1
Performance Training =  0.5512002506901758
Performance Validation =  0.5652187580843446

Fold  2
Performance Training =  0.5306581895113162
Performance Validation =  0.6356499612700908

Fold  3
Performance Training =  0.5359649666001715
Performance Validation =  0.43662671537227304

Fold  4
Performance Training =  0.6476071865291697
Performance Validation =  0.37562949552092073

Average Performance in Training =  0.5663576483327083
Average Performance in Validation =  0.5032812325619073
------------------------------------------------------

M Value =  5
Lambda Value =  0.39

Fold  1
Performance Training =  0.5498243041372736

```
Performance Validation =  0.5623304948472871


Fold  2
Performance Training =  0.5291383790691642
Performance Validation =  0.6335650357187561


Fold  3
Performance Training =  0.5344538086855897
Performance Validation =  0.43431531834845893


Fold  4
Performance Training =  0.646122472657942
Performance Validation =  0.3750193147122769


Average Performance in Training =  0.5648847411374924
Average Performance in Validation =  0.5013075409066947
-----------------------------------------------------


M Value =  5
Lambda Value =  0.4


Fold  1
Performance Training =  0.5484707511776719
Performance Validation =  0.5594711138116004


Fold  2
Performance Training =  0.5276429107819451
Performance Validation =  0.6315016848394962


Fold  3
Performance Training =  0.5329615665907711
Performance Validation =  0.4320372898492144


Fold  4
Performance Training =  0.6446494028675613
Performance Validation =  0.3744201645550451


Average Performance in Training =  0.5634311578544874
Average Performance in Validation =  0.49935756326383907
-----------------------------------------------------


M Value =  5
Lambda Value =  0.41000000000000003


Fold  1
Performance Training =  0.5471383829755347
Performance Validation =  0.5566399337656665


Fold  2
Performance Training =  0.5261705895843014
Performance Validation =  0.6294592603561335


Fold  3
Performance Training =  0.5314872579545679
Performance Validation =  0.429791112920203
```

```
Fold  4
Performance Training =  0.6431875252580739
Performance Validation =  0.373831010846829

Average Performance in Training =  0.5619959389431195
Average Performance in Validation =  0.497430329472208
-------------------------------------------------------

M Value =  5
Lambda Value =  0.42

Fold  1
Performance Training =  0.5458261038408903
Performance Validation =  0.5538363327821948

Fold  2
Performance Training =  0.524720328690675
Performance Validation =  0.6274371738868052

Fold  3
Performance Training =  0.5300299976454366
Performance Validation =  0.4275753977256007

Fold  4
Performance Training =  0.6417364405543784
Performance Validation =  0.3732509355431062

Average Performance in Training =  0.5605782176828451
Average Performance in Validation =  0.49552495998442675
-------------------------------------------------------

M Value =  5
Lambda Value =  0.43

Fold  1
Performance Training =  0.544532918364281
Performance Validation =  0.5510597411818576

Fold  2
Performance Training =  0.523291137354704
Performance Validation =  0.6254348895051378

Fold  3
Performance Training =  0.5285889865029539
Performance Validation =  0.4253888678690143

Fold  4
Performance Training =  0.6402957953899228
Performance Validation =  0.37267912291282335

Average Performance in Training =  0.5591772094029654
Average Performance in Validation =  0.49364065536720825
-------------------------------------------------------

M Value =  5
Lambda Value =  0.44
```

```
Fold  1
Performance Training =  0.5432579202058021
Performance Validation =  0.5483096353430366

Fold  2
Performance Training =  0.5218821101959299
Performance Validation =  0.6234519172962418

Fold  3
Performance Training =  0.527163501521786
Performance Validation =  0.42323034842060203

Fold  4
Performance Training =  0.6388652764838132
Performance Validation =  0.37211484750102086

Average Performance in Training =  0.5577922021018328
Average Performance in Validation =  0.49177668714022527
----------------------------------------------------

M Value =  5
Lambda Value =  0.45

Fold  1
Performance Training =  0.5420002823014749
Performance Validation =  0.5455855322562773

Fold  2
Performance Training =  0.5204924178709762
Performance Validation =  0.621487807765266

Fold  3
Performance Training =  0.525752887273903
Performance Validation =  0.42109875541069386

Fold  4
Performance Training =  0.6374446055836577
Performance Validation =  0.37155746363735154

Average Performance in Training =  0.5564225482575029
Average Performance in Validation =  0.4899323897673971
----------------------------------------------------

M Value =  5
Lambda Value =  0.46

Fold  1
Performance Training =  0.5407592482874101
Performance Validation =  0.5428869847337789

Fold  2
Performance Training =  0.5191212989012286
Performance Validation =  0.6195421469781431

Fold  3
```

```
Performance Training = 0.5243565483966729
Performance Validation = 0.41899308658757517


Fold  4
Performance Training = 0.636033535066292
Performance Validation = 0.3710063962710154


Average Performance in Training = 0.5550676576629009
Average Performance in Validation = 0.48810715364262824
-------------------------------------------------------

M Value = 5
Lambda Value = 0.47000000000000003

Fold  1
Performance Training = 0.539534124973239
Performance Validation = 0.5402135771948153


Fold  2
Performance Training = 0.5177680524979766
Performance Validation = 0.6176145523324261


Fold  3
Performance Training = 0.5229739430008686
Performance Validation = 0.41691241326808426


Fold  4
Performance Training = 0.6346318441050319
Performance Validation = 0.3704611329470474


Average Performance in Training = 0.553726991144279
Average Performance in Validation = 0.4863004189355933
-------------------------------------------------------

M Value = 5
Lambda Value = 0.48

Fold  1
Performance Training = 0.5383242757220319
Performance Validation = 0.5375649219574812


Fold  2
Performance Training = 0.5164320322500158
Performance Validation = 0.6157046688713834


Fold  3
Performance Training = 0.5216045768746072
Performance Validation = 0.41485587313548944


Fold  4
Performance Training = 0.6332393353258288
Performance Validation = 0.3699212167673741


Average Performance in Training = 0.552400055043121
Average Performance in Validation = 0.48451167018293206
-------------------------------------------------------
```

```
M Value =  5
Lambda Value =  0.49

Fold  1
Performance Training =  0.537129114615365
Performance Validation =  0.5349406559755564

Fold  2
Performance Training =  0.5151126405588198
Performance Validation =  0.6138121660673699

Fold  3
Performance Training =  0.5202479983776089
Performance Validation =  0.4128226638605804

Fold  4
Performance Training =  0.6318558318862262
Performance Validation =  0.3693862402037251

Average Performance in Training =  0.551086396359505
Average Performance in Validation =  0.48274043152680796
----------------------------------------------------

M Value =  5
Lambda Value =  0.5

Fold  1
Performance Training =  0.5359481013000966
Performance Validation =  0.5323404379667177

Fold  2
Performance Training =  0.5138093237231964
Performance Validation =  0.6119367350112508

Fold  3
Performance Training =  0.5189037939355516
Performance Validation =  0.41081203743999195

Fold  4
Performance Training =  0.6304811749206543
Performance Validation =  0.3688558396492573

Average Performance in Training =  0.5497855984698747
Average Performance in Validation =  0.48098626251680443
----------------------------------------------------

M Value =  5
Lambda Value =  0.51

Fold  1
Performance Training =  0.534780736428452
Performance Validation =  0.5297639458849198

Fold  2
Performance Training =  0.5125215675894814
```

```
Performance Validation =  0.6100780859537769


Fold  3
Performance Training =  0.5175715840572325
Performance Validation =  0.4088232951608852


Fold  4
Performance Training =  0.6291152213037303
Performance Validation =  0.3683296906122694


Average Performance in Training =  0.5484972773447241
Average Performance in Validation =  0.4792487544029629
-----------------------------------------------------

M Value =  5
Lambda Value =  0.52


Fold  1
Performance Training =  0.533626557615631
Performance Validation =  0.5272108746955044


Fold  2
Performance Training =  0.5112488936952421
Performance Validation =  0.60823594615249


Fold  3
Performance Training =  0.5162510198081727
Performance Validation =  0.4068557831139039


Fold  4
Performance Training =  0.6277578416900964
Performance Validation =  0.3678075034692935


Average Performance in Training =  0.5472210782022855
Average Performance in Validation =  0.477527526857798
-----------------------------------------------------

M Value =  5
Lambda Value =  0.53


Fold  1
Performance Training =  0.5324851358498308
Performance Validation =  0.5246809344167025


Fold  2
Performance Training =  0.509990855844525
Performance Validation =  0.6064100579842615


Fold  3
Performance Training =  0.5149417796835198
Performance Validation =  0.40490888818713755


Fold  4
Performance Training =  0.626408918795125
Performance Validation =  0.3672890197065396
```

```
Average Performance in Training =  0.5459566725432501
Average Performance in Validation =  0.47582222507366023
-------------------------------------------------------


M Value =  5
Lambda Value =  0.54

Fold  1
Performance Training =  0.5313560722985685
Performance Validation =  0.5221738483955978

Fold  2
Performance Training =  0.5087470370612115
Performance Validation =  0.6046001772891029

Fold  3
Performance Training =  0.5136435668309374
Performance Validation =  0.40298203448293934

Fold  4
Performance Training =  0.6250683458857573
Performance Validation =  0.36677400858857134

Average Performance in Training =  0.5447037555191188
Average Performance in Validation =  0.47413251718905286
-------------------------------------------------------


M Value =  5
Lambda Value =  0.55

Fold  1
Performance Training =  0.5302389954628726
Performance Validation =  0.519689351790559

Fold  2
Performance Training =  0.5075170468743114
Performance Validation =  0.6028060719156121

Fold  3
Performance Training =  0.512356106580826
Performance Validation =  0.4010746801073106

Fold  4
Performance Training =  0.6237360254549233
Performance Validation =  0.366262264201472

Average Performance in Training =  0.5434620435932334
Average Performance in Validation =  0.47245809200373845
-------------------------------------------------------


M Value =  5
Lambda Value =  0.56

Fold  1
Performance Training =  0.5291335586373923
Performance Validation =  0.5172271902355143
```

Fold  2
Performance Training =  0.506300518895188
Performance Validation =  0.6010275204424326

Fold  3
Performance Training =  0.5110791442469063
Performance Validation =  0.39918631428812257

Fold  4
Performance Training =  0.6224118680565767
Performance Validation =  0.36575360282488734

Average Performance in Training =  0.5422312724590158
Average Performance in Validation =  0.4707986569477392
----------------------------------------------------

M Value =  5
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.528039437640057
Performance Validation =  0.5147871186644734

Fold  2
Performance Training =  0.5050971086519966
Performance Validation =  0.5992643110535424

Fold  3
Performance Training =  0.5098124431650342
Performance Validation =  0.3973164547842153

Fold  4
Performance Training =  0.6210957912814278
Performance Validation =  0.3652478605934081

Average Performance in Training =  0.5410111951846289
Average Performance in Validation =  0.4691539362739098
----------------------------------------------------

M Value =  5
Lambda Value =  0.58

Fold  1
Performance Training =  0.5269563287796438
Performance Validation =  0.5123689002772743

Fold  2
Performance Training =  0.5039064916511361
Performance Validation =  0.5975162405481531

Fold  3
Performance Training =  0.5085557829422916
Performance Validation =  0.39546464555218497

Fold  4

Performance Training =  0.619787718856085
Performance Validation =  0.3647448914129421

Average Performance in Training =  0.5398015805572891
Average Performance in Validation =  0.4675236694476387
------------------------------------------------------

M Value =  5
Lambda Value =  0.59

Fold  1
Performance Training =  0.5258839470337067
Performance Validation =  0.5099723056298537

Fold  2
Performance Training =  0.5027283616393892
Performance Validation =  0.5957831134685072

Fold  3
Performance Training =  0.5073089578919621
Performance Validation =  0.3936304546419792

Fold  4
Performance Training =  0.6184875798505483
Performance Validation =  0.36424456510218084

Average Performance in Training =  0.5386022116039015
Average Performance in Validation =  0.4659076097106303
------------------------------------------------------

M Value =  5
Lambda Value =  0.6

Fold  1
Performance Training =  0.5248220244128079
Performance Validation =  0.5075971118343441

Fold  2
Performance Training =  0.5015624290437717
Performance Validation =  0.594064741331056

Fold  3
Performance Training =  0.5060717756330763
Performance Validation =  0.3918134722958875

Fold  4
Performance Training =  0.6171953079809557
Performance Validation =  0.3637467657330754

Average Performance in Training =  0.5374128842676529
Average Performance in Validation =  0.4643055227985907
------------------------------------------------------

M Value =  5
Lambda Value =  0.61

```
Fold  1
Performance Training =  0.5237703084900109
Performance Validation =  0.5052431018560326

Fold  2
Performance Training =  0.500408419568977
Performance Validation =  0.5923609419483653

Fold  3
Performance Training =  0.5048440558358713
Performance Validation =  0.3900133092287489

Fold  4
Performance Training =  0.6159108409961307
Performance Validation =  0.3632513901475284

Average Performance in Training =  0.5362334062227474
Average Performance in Validation =  0.46271718579516885
------------------------------------------------------

M Value =  5
Lambda Value =  0.62

Fold  1
Performance Training =  0.5227285610772
Performance Validation =  0.5029100638958037

Fold  2
Performance Training =  0.49926607293479763
Performance Validation =  0.5906715388307133

Fold  3
Performance Training =  0.503625629096798
Performance Validation =  0.38822959506981114

Fold  4
Performance Training =  0.6146341201379347
Performance Validation =  0.3627583466303482

Average Performance in Training =  0.5350635958116826
Average Performance in Validation =  0.46114238610666913
------------------------------------------------------

M Value =  5
Lambda Value =  0.63

Fold  1
Performance Training =  0.5216965570320398
Performance Validation =  0.500597790847995

Fold  2
Performance Training =  0.4981351417380522
Performance Validation =  0.5889963606577586

Fold  3
Performance Training =  0.5024163359287028
```

```
Performance Validation =  0.38646197694904205


Fold  4
Performance Training =  0.6133650896666671
Performance Validation =  0.36226755372094965


Average Performance in Training =  0.5339032810913655
Average Performance in Validation =  0.45958092054393634
-------------------------------------------------------

M Value =  5
Lambda Value =  0.64

Fold  1
Performance Training =  0.520674083181344
Performance Validation =  0.4983060798248181


Fold  2
Performance Training =  0.49701539042541165
Performance Validation =  0.5873352408118406


Fold  3
Performance Training =  0.50121602585353
Performance Validation =  0.3847101182127258


Fold  4
Performance Training =  0.6121036964438422
Performance Validation =  0.3617789391484306


Average Performance in Training =  0.532752298976032
Average Performance in Validation =  0.4580325944994539
-------------------------------------------------------

M Value =  5
Lambda Value =  0.65

Fold  1
Performance Training =  0.5196609373483142
Performance Validation =  0.49603473173951973


Fold  2
Performance Training =  0.49590659436514317
Performance Validation =  0.5856880169655501


Fold  3
Performance Training =  0.5000245565863994
Performance Validation =  0.38297369725491914


Fold  4
Performance Training =  0.6108498895656078
Performance Validation =  0.3612924388764781


Average Performance in Training =  0.5316104944663662
Average Performance in Validation =  0.45649722120911673
-------------------------------------------------------
```

```
M Value =  5
Lambda Value =  0.66

Fold  1
Performance Training =  0.5186569274725887
Performance Validation =  0.4937835509413939

Fold  2
Performance Training =  0.4948085390071991
Performance Validation =  0.5840545307171103

Fold  3
Performance Training =  0.49884179330122225
Performance Validation =  0.38125240645293534

Fold  4
Performance Training =  0.6096036200408896
Performance Validation =  0.3608079962461702

Average Performance in Training =  0.5304777199554749
Average Performance in Validation =  0.45497462108940245
------------------------------------------------------

M Value =  5
Lambda Value =  0.67

Fold  1
Performance Training =  0.517661870813326
Performance Validation =  0.491552344896533

Fold  2
Performance Training =  0.49372101912231303
Performance Validation =  0.5824346272678964

Fold  3
Performance Training =  0.49766760796914933
Performance Validation =  0.37954595119628887

Fold  4
Performance Training =  0.6083648405090578
Performance Validation =  0.360325561206141

Average Performance in Training =  0.5293538346034616
Average Performance in Validation =  0.4534646211417148
------------------------------------------------------

M Value =  5
Lambda Value =  0.68

Fold  1
Performance Training =  0.5166755932266713
Performance Validation =  0.4893409239089531

Fold  2
Performance Training =  0.4926438381118369
Performance Validation =  0.5808281551371225
```

Fold  3
Performance Training =  0.4965018787621578
Performance Validation =  0.37785404899979047


Fold  4
Performance Training =  0.6071335049925265
Performance Validation =  0.3598450896207849


Average Performance in Training =  0.5282387037732981
Average Performance in Validation =  0.45196705441666274
------------------------------------------------------

M Value =  5
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.5156979285099395
Performance Validation =  0.48714910087732377


Fold  2
Performance Training =  0.4915768073809993
Performance Validation =  0.5792349659093214


Fold  3
Performance Training =  0.49534448951495125
Performance Validation =  0.37617642869248336


Fold  4
Performance Training =  0.6059095686802571
Performance Validation =  0.35936654264825996


Average Performance in Training =  0.5271321985215367
Average Performance in Validation =  0.45048175953184716
------------------------------------------------------

M Value =  5
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.5147287178057068
Performance Validation =  0.4849766910830955


Fold  2
Performance Training =  0.4905197457690851
Performance Validation =  0.5776549140107721


Fold  3
Performance Training =  0.49419532923911436
Performance Validation =  0.374512829675018


Fold  4
Performance Training =  0.6046929877385833
Performance Validation =  0.3588898861809663


Average Performance in Training =  0.5260341951381223

Average Performance in Validation =  0.44900858023746293
----------------------------------------------------

M Value =  5
Lambda Value =  0.71

Fold  1
Performance Training =  0.5137678090597667
Performance Validation =  0.4828235120063168

Fold  2
Performance Training =  0.4894724790307666
Performance Validation =  0.5760878565114836

Fold  3
Performance Training =  0.4930542916841367
Performance Validation =  0.3728630012388573

Fold  4
Performance Training =  0.6034837191462253
Performance Validation =  0.3584150903420098

Average Performance in Training =  0.5249445747302238
Average Performance in Validation =  0.44754736502466685
----------------------------------------------------

M Value =  5
Lambda Value =  0.72

Fold  1
Performance Training =  0.5128150565275564
Performance Validation =  0.48068938316582566

Fold  2
Performance Training =  0.48843483936344945
Performance Validation =  0.5745336529497609

Fold  3
Performance Training =  0.49192127494052085
Performance Validation =  0.3712267019414287

Fold  4
Performance Training =  0.6022817205506957
Performance Validation =  0.35794212903187594

Average Performance in Training =  0.5238632228455556
Average Performance in Validation =  0.4460979667722228
----------------------------------------------------

M Value =  5
Lambda Value =  0.73

Fold  1
Performance Training =  0.5118703203242687
Performance Validation =  0.47857412598092675

```
Fold  2
Performance Training =  0.48740666497605956
Performance Validation =  0.5729921651767107


Fold  3
Performance Training =  0.4907961810807042
Performance Validation =  0.369603699031971


Fold  4
Performance Training =  0.6010869501436414
Performance Validation =  0.35747097952017837


Average Performance in Training =  0.5227900291311685
Average Performance in Validation =  0.44466024242744673
-------------------------------------------------------

M Value =  5
Lambda Value =  0.74

Fold  1
Performance Training =  0.5109334660143569
Performance Validation =  0.47647756365195226


Fold  2
Performance Training =  0.4863877996951932
Performance Validation =  0.5714632572183738


Fold  3
Performance Training =  0.48967891583398826
Performance Validation =  0.36799376792330984


Fold  4
Performance Training =  0.5998993665529402
Performance Validation =  0.35700162207789454


Average Performance in Training =  0.5217248870241196
Average Performance in Validation =  0.44323405271788263
-------------------------------------------------------

M Value =  5
Lambda Value =  0.75

Fold  1
Performance Training =  0.5100043642366137
Performance Validation =  0.4743995210574441


Fold  2
Performance Training =  0.4853780926049821
Performance Validation =  0.569946795153432


Fold  3
Performance Training =  0.4885693882920823
Performance Validation =  0.3663966917053775


Fold  4
Performance Training =  0.5987189287496157
```

Performance Validation =  0.3565340396460126

Average Performance in Training =  0.5206676934708234
Average Performance in Validation =  0.44181926189056653
-------------------------------------------------------

M Value =  5
Lambda Value =  0.76

Fold  1
Performance Training =  0.5090828903614014
Performance Validation =  0.4723398246659174

Fold  2
Performance Training =  0.48437739771742616
Performance Validation =  0.5684426470046777

Fold  3
Performance Training =  0.4874675106422176
Performance Validation =  0.36481226069664785

Fold  4
Performance Training =  0.5975455959678608
Performance Validation =  0.3560682175369312

Average Performance in Training =  0.5196183486722266
Average Performance in Validation =  0.44041573747604357
-------------------------------------------------------

M Value =  5
Lambda Value =  0.77

Fold  1
Performance Training =  0.5081689241769703
Performance Validation =  0.4702983024604289

Fold  2
Performance Training =  0.483385573670274
Performance Validation =  0.5669506826426498

Fold  3
Performance Training =  0.4863731979251239
Performance Validation =  0.3632402720300788

Fold  4
Performance Training =  0.5963793276366505
Performance Validation =  0.3556041431653566

Average Performance in Training =  0.5185767558522547
Average Performance in Validation =  0.43902335007462845
-------------------------------------------------------

M Value =  5
Lambda Value =  0.78

Fold  1

```
Performance Training =  0.5072623496021197
Performance Validation =  0.46827478387435695


Fold  2
Performance Training =  0.4824024834498395
Performance Validation =  0.5654707737000144


Fold  3
Performance Training =  0.4852863678154249
Performance Validation =  0.36168052927048566


Fold  4
Performance Training =  0.5952200833215938
Performance Validation =  0.3551418058057718


Average Performance in Training =  0.5175428210472445
Average Performance in Validation =  0.4376419731626572
------------------------------------------------------

M Value =  5
Lambda Value =  0.79


Fold  1
Performance Training =  0.5063630544227291
Performance Validation =  0.46626909973698794


Fold  2
Performance Training =  0.4814279941364177
Performance Validation =  0.5640027934954432


Fold  3
Performance Training =  0.48420694042228307
Performance Validation =  0.3601328420605884


Fold  4
Performance Training =  0.5940678226758271
Performance Validation =  0.3546811963738644


Average Performance in Training =  0.5165164529143143
Average Performance in Validation =  0.436271482916721
------------------------------------------------------

M Value =  5
Lambda Value =  0.8


Fold  1
Performance Training =  0.5054709300499642
Performance Validation =  0.46428108222767817


Fold  2
Performance Training =  0.48046197667019563
Performance Validation =  0.562546616965887


Fold  3
Performance Training =  0.4831348381083246
Performance Validation =  0.3585970257932094
```

```
Fold  4
Performance Training =  0.5929225053988849
Performance Validation =  0.35422230722956705

Average Performance in Training =  0.5154975625568423
Average Performance in Validation =  0.43491175805408544
---------------------------------------------------

M Value =  5
Lambda Value =  0.81

Fold  1
Performance Training =  0.504585871298138
Performance Validation =  0.4623105648374711

Fold  2
Performance Training =  0.47950430563576696
Performance Validation =  0.561102120606245

Fold  3
Performance Training =  0.48206998532509693
Performance Validation =  0.35707290130738434

Fold  4
Performance Training =  0.5917840912026044
Performance Validation =  0.3537651319996019

Average Performance in Training =  0.5144860633654016
Average Performance in Validation =  0.4335626796876756
---------------------------------------------------

M Value =  5
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.5037077761804634
Performance Validation =  0.4603573823372198

Fold  2
Performance Training =  0.4785548590635543
Performance Validation =  0.5596691824155839

Fold  3
Performance Training =  0.48101230846347276
Performance Validation =  0.35556029460634

Fold  4
Performance Training =  0.5906525397832227
Performance Validation =  0.35330966541764186

Average Performance in Training =  0.5134818708726783
Average Performance in Validation =  0.43222413119419634
---------------------------------------------------

M Value =  5
```

Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.5028365457210587
Performance Validation =  0.45842137075132994

Fold  2
Performance Training =  0.47761351824660725
Performance Validation =  0.558247681849122

Fold  3
Performance Training =  0.47996173571758294
Performance Validation =  0.3540590365954934

Fold  4
Performance Training =  0.5895278107989164
Performance Validation =  0.3528559031803845

Average Performance in Training =  0.5124849026210413
Average Performance in Validation =  0.4308959980940824
------------------------------------------------------

M Value =  5
Lambda Value =  0.84

Fold  1
Performance Training =  0.5019720837817638
Performance Validation =  0.45650236733638216

Fold  2
Performance Training =  0.47668016757139586
Performance Validation =  0.5568374997753012

Fold  3
Performance Training =  0.4789181969609967
Performance Validation =  0.352568962838795

Fold  4
Performance Training =  0.5884098638521236
Performance Validation =  0.35240384181800954

Average Performance in Training =  0.51149507804157
Average Performance in Validation =  0.42957816794212195
------------------------------------------------------

M Value =  5
Lambda Value =  0.85

Fold  1
Performance Training =  0.5011142969024425
Performance Validation =  0.45460021056394095

Fold  2
Performance Training =  0.4757546943613573
Performance Validation =  0.5554385184373465

```
Fold  3
Performance Training =  0.47788162363399844
Performance Validation =  0.35108991333190687


Fold  4
Performance Training =  0.5872986584760542
Performance Validation =  0.3519534785776407


Average Performance in Training =  0.5105123183434631
Average Performance in Validation =  0.4282705302277088
----------------------------------------------------

M Value =  5
Lambda Value =  0.86


Fold  1
Performance Training =  0.5002630941535866
Performance Validation =  0.45271474010697366


Fold  2
Performance Training =  0.4748369887320717
Performance Validation =  0.554050621418771


Fold  3
Performance Training =  0.47685194864091907
Performance Validation =  0.34962173229082427


Fold  4
Performance Training =  0.5861941541248656
Performance Validation =  0.35150481131857314


Average Performance in Training =  0.5095365464128607
Average Performance in Validation =  0.4269729762837855
----------------------------------------------------

M Value =  5
Lambda Value =  0.87


Fold  1
Performance Training =  0.49941838700014785
Performance Validation =  0.4508457968293422


Fold  2
Performance Training =  0.4739269434570489
Performance Validation =  0.5526736936123586


Fold  3
Performance Training =  0.4758291062565889
Performance Validation =  0.34816426795471644


Fold  4
Performance Training =  0.5850963101670319
Performance Validation =  0.351057838418141


Average Performance in Training =  0.5085676867202045
Average Performance in Validation =  0.42568539920363957
```

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 _____

M Value =  5
Lambda Value =  0.88

Fold  1
Performance Training =  0.49858008917561847
Performance Validation =  0.44899322277790765

Fold  2
Performance Training =  0.4730244538432127
Performance Validation =  0.5513076211922007

Fold  3
Performance Training =  0.47481303204105896
Performance Validation =  0.34671737240181044

Fold  4
Performance Training =  0.5840050858814971
Performance Validation =  0.3506125586872201

Average Performance in Training =  0.5076056652353469
Average Performance in Validation =  0.4244076937647847
 _____

M Value =  5
Lambda Value =  0.89

Fold  1
Performance Training =  0.4977481165654859
Performance Validation =  0.4471568611768396

Fold  2
Performance Training =  0.47212941761524685
Performance Validation =  0.5499522915884155

Fold  3
Performance Training =  0.47380366276183183
Performance Validation =  0.3452809013773197

Fold  4
Performance Training =  0.5829204404562378
Performance Validation =  0.3501689712944479

Average Performance in Training =  0.5066504093497006
Average Performance in Validation =  0.4231397563592557
 _____

M Value =  5
Lambda Value =  0.9

Fold  1
Performance Training =  0.4969223870992563
Performance Validation =  0.44533655642377756

Fold  2
```

```
Performance Training =  0.4712417348080513
Performance Validation =  0.5486075934642246


Fold  3
Performance Training =  0.472800936322907
Performance Validation =  0.3438547141324447


Fold  4
Performance Training =  0.5818423329889071
Performance Validation =  0.34972707569834005


Average Performance in Training =  0.5057018478047804
Average Performance in Validation =  0.4218814849296968
------------------------------------------------------

M Value =  5
Lambda Value =  0.91


Fold  1
Performance Training =  0.4961028206503265
Performance Validation =  0.4435321540875141


Fold  2
Performance Training =  0.47036130766662654
Performance Validation =  0.5472734166950837


Fold  3
Performance Training =  0.47180479170001666
Performance Validation =  0.34243867327359867


Fold  4
Performance Training =  0.5807707224892724
Performance Validation =  0.34928687158655536


Average Performance in Training =  0.5047599106265606
Average Performance in Validation =  0.42063277891068795
------------------------------------------------------

M Value =  5
Lambda Value =  0.92


Fold  1
Performance Training =  0.4952893389430426
Performance Validation =  0.4417435009069385


Fold  2
Performance Training =  0.4694880405527636
Performance Validation =  0.5459496523496267


Fold  3
Performance Training =  0.4708151688814838
Performance Validation =  0.34103264462107363


Fold  4
Performance Training =  0.5797055678831827
Performance Validation =  0.34884835882163356
```

```
Average Performance in Training =  0.5038245290651182
Average Performance in Validation =  0.4193935391748181
-----------------------------------------------------

M Value =  5
Lambda Value =  0.93

Fold  1
Performance Training =  0.4944818654663453
Performance Validation =  0.43997044479099057

Fold  2
Performance Training =  0.46862183985797856
Performance Validation =  0.544636192672175

Fold  3
Performance Training =  0.4698320088141932
Performance Validation =  0.33963649707641863

Fold  4
Performance Training =  0.5786468280178383
Performance Validation =  0.3484115373926002

Average Performance in Training =  0.5028956355390888
Average Performance in Validation =  0.4181636679830461
-----------------------------------------------------

M Value =  5
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.49368032539346396
Performance Validation =  0.4382128348194081

Fold  2
Performance Training =  0.46776261392218
Performance Validation =  0.5433329310666279

Fold  3
Performance Training =  0.4688552533542064
Performance Validation =  0.33825010249788234

Fold  4
Performance Training =  0.5775944616681576
Performance Validation =  0.3479764073718794

Average Performance in Training =  0.501973163584502
Average Performance in Validation =  0.41694306893894945
-----------------------------------------------------

M Value =  5
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.4928846455071547
```

Performance Validation = 0.436470521244094

Fold  2
Performance Training = 0.46691027295760446
Performance Validation = 0.542039762081544

Fold  3
Performance Training = 0.46788484522160434
Performance Validation = 0.336873335583317

Fold  4
Performance Training = 0.5765484275440611
Performance Validation = 0.34754296887701663

Average Performance in Training = 0.5010570478076062
Average Performance in Validation = 0.4157316469464929
--------------------------------------------------------

M Value =  5
Lambda Value =  0.96

Fold  1
Performance Training = 0.4920947541300389
Performance Validation = 0.4347433554909321

Fold  2
Performance Training = 0.4660647289775933
Performance Validation = 0.5407565813962578

Fold  3
Performance Training = 0.4669207279591706
Performance Validation = 0.3355060737599894

Fold  4
Performance Training = 0.5755086842985129
Performance Validation = 0.34711122203675915

Average Performance in Training = 0.5001472238413289
Average Performance in Validation = 0.41452930817098466
--------------------------------------------------------

M Value =  5
Lambda Value =  0.97

Fold  1
Performance Training = 0.49131058105962755
Performance Validation = 0.4330311901619167

Fold  2
Performance Training = 0.4652258957298281
Performance Validation = 0.5394832858078978

Fold  3
Performance Training = 0.4659628458945714
Performance Validation = 0.334148197080798

```
Fold  4
Performance Training =  0.574475190536175
Performance Validation =  0.34668116696107787

Average Performance in Training =  0.49924362830505054
Average Performance in Validation =  0.4133359600029226
------------------------------------------------------

M Value =  5
Lambda Value =  0.98

Fold  1
Performance Training =  0.4905320575076557
Performance Validation =  0.4313338790374729

Fold  2
Performance Training =  0.46439368863367303
Performance Validation =  0.5382197732191785

Fold  3
Performance Training =  0.46501114410571753
Performance Validation =  0.33279958812643307

Fold  4
Performance Training =  0.5734479048225547
Performance Validation =  0.3462528037147605

Average Performance in Training =  0.4983461987674002
Average Performance in Validation =  0.41215151102446124
------------------------------------------------------

M Value =  5
Lambda Value =  0.99

Fold  1
Performance Training =  0.48975911604338584
Performance Validation =  0.42965127707886464

Fold  2
Performance Training =  0.46356802472130154
Performance Validation =  0.53696594262686

Fold  3
Performance Training =  0.4640655683890227
Performance Validation =  0.33146013191305956

Fold  4
Performance Training =  0.5724267856935308
Performance Validation =  0.345826132294236

Average Performance in Training =  0.4974548737118102
Average Performance in Validation =  0.41097587097825505
------------------------------------------------------

M Value =  5
Lambda Value =  1.0
```

Fold  1
Performance Training =  0.4889916905405688
Performance Validation =  0.42798324043059977

Fold  2
Performance Training =  0.4627488225823142
Performance Validation =  0.5357216941107787

Fold  3
Performance Training =  0.4631260652302961
Performance Validation =  0.33012971580512096

Fold  4
Performance Training =  0.5714117916651618
Performance Validation =  0.34540115260732107

Average Performance in Training =  0.4965695925045852
Average Performance in Validation =  0.40980895073845514
----------------------------------------------------

M Value =  5
Lambda Value =  1.01

Fold  1
Performance Training =  0.4882297161277712
Performance Validation =  0.42632962642275607

Fold  2
Performance Training =  0.4619360023115835
Performance Validation =  0.5344869288233701

Fold  3
Performance Training =  0.4621925817780348
Performance Validation =  0.32880822943290877

Fold  4
Performance Training =  0.5704028812436925
Performance Validation =  0.34497786445561196

Average Performance in Training =  0.4956902953652705
Average Performance in Validation =  0.40865066228366176
----------------------------------------------------

M Value =  5
Lambda Value =  1.02

Fold  1
Performance Training =  0.4874731291418156
Performance Validation =  0.42469029357316923

Fold  2
Performance Training =  0.4611294854600765
Performance Validation =  0.533261548979605

Fold  3

Performance Training =  0.4612650658189025
Performance Validation =  0.3274955646145822


Fold  4
Performance Training =  0.5694000129356838
Performance Validation =  0.34455626751926505


Average Performance in Training =  0.4948169233391196
Average Performance in Validation =  0.40750091867165533
------------------------------------------------------

M Value =  5
Lambda Value =  1.03

Fold  1
Performance Training =  0.48672186708408904
Performance Validation =  0.4230651015894151


Fold  2
Performance Training =  0.4603291949884355
Performance Validation =  0.5320454578472793


Fold  3
Performance Training =  0.460343465755198
Performance Validation =  0.32619161528231233


Fold  4
Performance Training =  0.5684031452582008
Performance Validation =  0.34413636134393777


Average Performance in Training =  0.4939494182714808
Average Performance in Validation =  0.40635963401573616
------------------------------------------------------

M Value =  5
Lambda Value =  1.04

Fold  1
Performance Training =  0.4859758685795007
Performance Validation =  0.421453911370557


Fold  2
Performance Training =  0.4595350552231098
Performance Validation =  0.5308385597376031


Fold  3
Performance Training =  0.45942773058413444
Performance Validation =  0.32489627741227745


Fold  4
Performance Training =  0.567412236748999
Performance Validation =  0.3437181453296779


Average Performance in Training =  0.493087722783936
Average Performance in Validation =  0.40522672346252886
------------------------------------------------------

```
M Value =  5
Lambda Value =  1.05

Fold  1
Performance Training =  0.48523507333789373
Performance Validation =  0.41985658500860856

Fold  2
Performance Training =  0.4587469918148501
Performance Validation =  0.5296407599960309

Fold  3
Performance Training =  0.4585178098787701
Performance Validation =  0.3236094489582656

Fold  4
Performance Training =  0.5664272459766633
Performance Validation =  0.3433016187215725

Average Performance in Training =  0.49223178025204434
Average Performance in Validation =  0.4041021031711194
----------------------------------------------------

M Value =  5
Lambda Value =  1.06

Fold  1
Performance Training =  0.484499422117719
Performance Validation =  0.4182729857896894

Fold  2
Performance Training =  0.45796493169939867
Performance Validation =  0.5284519649933044

Fold  3
Performance Training =  0.4576136537704436
Performance Validation =  0.32233102978862105

Fold  4
Performance Training =  0.5654481315506564
Performance Validation =  0.34288678060198174

Average Performance in Training =  0.4913815347845545
Average Performance in Validation =  0.40298569029339915
----------------------------------------------------

M Value =  5
Lambda Value =  1.07

Fold  1
Performance Training =  0.4837688566918109
Performance Validation =  0.41670297819484436

Fold  2
Performance Training =  0.4571888030602116
```

```
Performance Validation =  0.5272720821166623


Fold  3
Performance Training =  0.45671521293257533
Performance Validation =  0.3210609216263357


Fold  4
Performance Training =  0.5644748521312362
Performance Validation =  0.34247362988420293


Average Performance in Training =  0.4905369312039585
Average Performance in Validation =  0.40187740295551133
------------------------------------------------------

M Value =  5
Lambda Value =  1.08


Fold  1
Performance Training =  0.4830433198151045
Performance Validation =  0.4151464279005116


Fold  2
Performance Training =  0.4564185352930701
Performance Validation =  0.5261010197611873


Fold  3
Performance Training =  0.45582243856572024
Performance Validation =  0.3197990279920677


Fold  4
Performance Training =  0.5635073664392158
Performance Validation =  0.3420621653074175


Average Performance in Training =  0.48969791502827764
Average Performance in Validation =  0.40077716024029597
------------------------------------------------------

M Value =  5
Lambda Value =  1.09


Fold  1
Performance Training =  0.482322755194153
Performance Validation =  0.4136032017786241


Fold  2
Performance Training =  0.4556540589724508
Performance Validation =  0.5249386873212608


Fold  3
Performance Training =  0.4549352823837539
Performance Validation =  0.31854525414990864


Fold  4
Performance Training =  0.5625456332655348
Performance Validation =  0.34165238543279464
```

```
Average Performance in Training =  0.48886443245397315
Average Performance in Validation =  0.39968488217064707
----------------------------------------------------


M Value =  6
Lambda Value =  0.01

Fold  1
Performance Training =  0.7052460416489124
Performance Validation =  0.5269324887961093

Fold  2
Performance Training =  0.6809897153260456
Performance Validation =  0.7554669744569561

Fold  3
Performance Training =  0.6734276921708066
Performance Validation =  0.6335147361394746

Fold  4
Performance Training =  0.7484763981589065
Performance Validation =  0.5214631244656718

Average Performance in Training =  0.7020349618261678
Average Performance in Validation =  0.609344330964553
----------------------------------------------------


M Value =  6
Lambda Value =  0.02

Fold  1
Performance Training =  0.6939589694496702
Performance Validation =  0.5747310058684523

Fold  2
Performance Training =  0.6674875318097495
Performance Validation =  0.754137414093204

Fold  3
Performance Training =  0.6631144268558781
Performance Validation =  0.6161121174043983

Fold  4
Performance Training =  0.7413084296139816
Performance Validation =  0.49984485146441815

Average Performance in Training =  0.6914673394323199
Average Performance in Validation =  0.6112063472076181
----------------------------------------------------


M Value =  6
Lambda Value =  0.03

Fold  1
Performance Training =  0.6842518841992262
Performance Validation =  0.6092545680724275
```

```
Fold  2
Performance Training =  0.6584817731045262
Performance Validation =  0.7519549038909337


Fold  3
Performance Training =  0.6557877568606472
Performance Validation =  0.60424127315523


Fold  4
Performance Training =  0.7366653312892741
Performance Validation =  0.4856836917134354


Average Performance in Training =  0.6837966863634184
Average Performance in Validation =  0.6127836092080067
----------------------------------------------------


M Value =  6
Lambda Value =  0.04


Fold  1
Performance Training =  0.6755630012713499
Performance Validation =  0.63188279611447


Fold  2
Performance Training =  0.6510206500066766
Performance Validation =  0.7491710812286557


Fold  3
Performance Training =  0.6494991897287168
Performance Validation =  0.5944369165595728


Fold  4
Performance Training =  0.732816562506384
Performance Validation =  0.47490555355520314


Average Performance in Training =  0.6772248508782819
Average Performance in Validation =  0.6125990868644754
----------------------------------------------------


M Value =  6
Lambda Value =  0.05


Fold  1
Performance Training =  0.6678109127138002
Performance Validation =  0.6467073436351356


Fold  2
Performance Training =  0.6444910771049419
Performance Validation =  0.7461057247717503


Fold  3
Performance Training =  0.6438886125165255
Performance Validation =  0.5858841604782257


Fold  4
```

Performance Training =  0.729409550959655
Performance Validation =  0.46624775840191934

Average Performance in Training =  0.6714000383237306
Average Performance in Validation =  0.6112362468217577
------------------------------------------------------

M Value =  6
Lambda Value =  0.06

Fold  1
Performance Training =  0.6609025258850203
Performance Validation =  0.656477119806416

Fold  2
Performance Training =  0.6386650700045016
Performance Validation =  0.742951811579863

Fold  3
Performance Training =  0.6388245205060024
Performance Validation =  0.5782479927151233

Fold  4
Performance Training =  0.7263222941216926
Performance Validation =  0.45909044211736183

Average Performance in Training =  0.6661786026293042
Average Performance in Validation =  0.6091918415546911
------------------------------------------------------

M Value =  6
Lambda Value =  0.07

Fold  1
Performance Training =  0.6547315351734225
Performance Validation =  0.6629046674949259

Fold  2
Performance Training =  0.6334137423659933
Performance Validation =  0.7398131360502778

Fold  3
Performance Training =  0.6342254782075791
Performance Validation =  0.5713366311925696

Fold  4
Performance Training =  0.7234915838400182
Performance Validation =  0.4530595847093636

Average Performance in Training =  0.6614655848967533
Average Performance in Validation =  0.6067785048617842
------------------------------------------------------

M Value =  6
Lambda Value =  0.08

```
Fold  1
Performance Training =  0.6491948464732658
Performance Validation =  0.667065514351883

Fold  2
Performance Training =  0.6286452681956587
Performance Validation =  0.7367418877197628

Fold  3
Performance Training =  0.6300272175246353
Performance Validation =  0.5650189828609185

Fold  4
Performance Training =  0.7208748119129311
Performance Validation =  0.44790440066033443

Average Performance in Training =  0.6571855360266228
Average Performance in Validation =  0.6041826963982246
------------------------------------------------------

M Value =  6
Lambda Value =  0.09

Fold  1
Performance Training =  0.6442002179751452
Performance Validation =  0.6696509798997554

Fold  2
Performance Training =  0.624287436260826
Performance Validation =  0.7337616219836107

Fold  3
Performance Training =  0.6261753773173087
Performance Validation =  0.5591971861009086

Fold  4
Performance Training =  0.7184392339512993
Performance Validation =  0.4434461748201741

Average Performance in Training =  0.6532755663761447
Average Performance in Validation =  0.6015139907011122
------------------------------------------------------

M Value =  6
Lambda Value =  0.1

Fold  1
Performance Training =  0.6396682291392837
Performance Validation =  0.6711167805115781

Fold  2
Performance Training =  0.6202812358288753
Performance Validation =  0.7308802780760248

Fold  3
Performance Training =  0.6226233737312503
```

```
Performance Validation =  0.5537948348470196


Fold  4
Performance Training =  0.716158239217778
Performance Validation =  0.4395524447341699


Average Performance in Training =  0.6496827694792968
Average Performance in Validation =  0.598836084542198
-------------------------------------------------------


M Value =  6
Lambda Value =  0.11


Fold  1
Performance Training =  0.6355317278163133
Performance Validation =  0.6717706087791937


Fold  2
Performance Training =  0.6165776815212913
Performance Validation =  0.7280974597363212


Fold  3
Performance Training =  0.6193313055584242
Performance Validation =  0.5487507554315767


Fold  4
Performance Training =  0.7140096976643424
Performance Validation =  0.4361222626182266


Average Performance in Training =  0.6463626031400929
Average Performance in Validation =  0.5961852716413296
-------------------------------------------------------


M Value =  6
Lambda Value =  0.12


Fold  1
Performance Training =  0.6317343754829562
Performance Validation =  0.6718248140215977


Fold  2
Performance Training =  0.6131357983467924
Performance Validation =  0.7254085093672908


Fold  3
Performance Training =  0.6162650700020984
Performance Validation =  0.5440151793234308


Fold  4
Performance Training =  0.7119750192700671
Performance Validation =  0.4330770594015707


Average Performance in Training =  0.6432775657754786
Average Performance in Validation =  0.5935813905284725
-------------------------------------------------------
```

M Value =  6
Lambda Value =  0.13

Fold  1
Performance Training =  0.6282290114321596
Performance Validation =  0.6714288767324262

Fold  2
Performance Training =  0.609921143148789
Performance Validation =  0.7228067892825302

Fold  3
Performance Training =  0.6133955550371931
Performance Validation =  0.5395471470856944

Fold  4
Performance Training =  0.7100385072363803
Performance Validation =  0.4303546475414316

Average Performance in Training =  0.6403960542136306
Average Performance in Validation =  0.5910343651605205
------------------------------------------------------

M Value =  6
Lambda Value =  0.14

Fold  1
Performance Training =  0.6249761247572739
Performance Validation =  0.6706899217807143

Fold  2
Performance Training =  0.606904645895123
Performance Validation =  0.7202849517643417

Fold  3
Performance Training =  0.6106979066457022
Performance Validation =  0.5353126390816787

Fold  4
Performance Training =  0.7081868634173349
Performance Validation =  0.42790511677066523

Average Performance in Training =  0.6376913851788585
Average Performance in Validation =  0.58854815734935
------------------------------------------------------

M Value =  6
Lambda Value =  0.15

Fold  1
Performance Training =  0.6219425291388259
Performance Validation =  0.6696859770063792

Fold  2
Performance Training =  0.6040616775741166
Performance Validation =  0.7178356335698317

```
Fold  3
Performance Training =  0.6081508815496437
Performance Validation =  0.5312831793151319


Fold  4
Performance Training =  0.7064087912048489
Performance Validation =  0.4256879348911078


Average Performance in Training =  0.6351409698668588
Average Performance in Validation =  0.5861231811956127
------------------------------------------------------


M Value =  6
Lambda Value =  0.16


Fold  1
Performance Training =  0.6191002531424612
Performance Validation =  0.6684747259467809


Fold  2
Performance Training =  0.6013712928174136
Performance Validation =  0.7154518207654597


Fold  3
Performance Training =  0.6057362880904813
Performance Validation =  0.5274347677758641


Fold  4
Performance Training =  0.7046946701398988
Performance Validation =  0.42366984780622663


Average Performance in Training =  0.6327256260475638
Average Performance in Validation =  0.5837577905735829
------------------------------------------------------


M Value =  6
Lambda Value =  0.17


Fold  1
Performance Training =  0.6164256269361363
Performance Validation =  0.6670993986147316


Fold  2
Performance Training =  0.5988156118519878
Performance Validation =  0.7131270244956482


Fold  3
Performance Training =  0.6034385105532276
Performance Validation =  0.5237470505166684


Fold  4
Performance Training =  0.7030362871312417
Performance Validation =  0.42182332692901325


Average Performance in Training =  0.6304290091181484
```

```
Average Performance in Validation =  0.5814492001390154
-----------------------------------------------------

M Value =  6
Lambda Value =  0.18

Fold  1
Performance Training =  0.6138985367391798
Performance Validation =  0.6655928064375813

Fold  2
Performance Training =  0.5963793148392393
Performance Validation =  0.7108553490097672

Fold  3
Performance Training =  0.6012441083108051
Performance Validation =  0.5202026665260493

Fold  4
Performance Training =  0.7014266136657785
Performance Validation =  0.42012540130326104

Average Performance in Training =  0.6282371433887507
Average Performance in Validation =  0.5791940558191647
-----------------------------------------------------

M Value =  6
Lambda Value =  0.19

Fold  1
Performance Training =  0.6115018180061025
Performance Validation =  0.6639801506398196

Fold  2
Performance Training =  0.5940492271817054
Performance Validation =  0.7086314993849585

Fold  3
Performance Training =  0.5991414798427839
Performance Validation =  0.5167867285915211

Fold  4
Performance Training =  0.6998596207763949
Performance Validation =  0.41855676597970515

Average Performance in Training =  0.6261380364517467
Average Performance in Validation =  0.5769887861490011
-----------------------------------------------------

M Value =  6
Lambda Value =  0.2

Fold  1
Performance Training =  0.6092207615095273
Performance Validation =  0.6622810056934156
```

```
Fold  2
Performance Training =  0.5918139785426213
Performance Validation =  0.7064507567433307


Fold  3
Performance Training =  0.5971205818544367
Performance Validation =  0.513486407146454


Fold  4
Performance Training =  0.6983301251041929
Performance Validation =  0.41710109240984183


Average Performance in Training =  0.6241213617526946
Average Performance in Validation =  0.5748298154982605
----------------------------------------------------

M Value =  6
Lambda Value =  0.21

Fold  1
Performance Training =  0.6070427105728526
Performance Validation =  0.6605107389963868


Fold  2
Performance Training =  0.5896637216502647
Performance Validation =  0.7043089372456863


Fold  3
Performance Training =  0.5951726946099795
Performance Validation =  0.510290594151977


Fold  4
Performance Training =  0.6968336605875177
Performance Validation =  0.4157444889136933


Average Performance in Training =  0.6221781968551536
Average Performance in Validation =  0.5727136898269358
----------------------------------------------------

M Value =  6
Lambda Value =  0.22

Fold  1
Performance Training =  0.6049567316632425
Performance Validation =  0.6586815395548367


Fold  2
Performance Training =  0.5875898996563405
Performance Validation =  0.7022023443277938


Fold  3
Performance Training =  0.5932902257426352
Performance Validation =  0.507189629759593


Fold  4
Performance Training =  0.6953663712795868
```

Performance Validation =  0.4144750741860803

Average Performance in Training =  0.6203008070854512
Average Performance in Validation =  0.5706371469570759
--------------------------------------------------------

M Value =  6
Lambda Value =  0.23

Fold  1
Performance Training =  0.6029533440128512
Performance Validation =  0.6568031718036097

Fold  2
Performance Training =  0.5855850530036353
Performance Validation =  0.7001277195853909

Fold  3
Performance Training =  0.5914665459738975
Performance Validation =  0.5041750786205846

Fold  4
Performance Training =  0.6939249215980847
Performance Validation =  0.41328263699949885

Average Performance in Training =  0.6184824661471171
Average Performance in Validation =  0.568597151752271
--------------------------------------------------------

M Value =  6
Lambda Value =  0.24

Fold  1
Performance Training =  0.6010242968091186
Performance Validation =  0.6548835337837167

Fold  2
Performance Training =  0.5836426585220033
Performance Validation =  0.6980821952896075

Fold  3
Performance Training =  0.5896958512523578
Performance Validation =  0.5012395457433465

Fold  4
Performance Training =  0.6925064209738927
Performance Validation =  0.4121583623665702

Average Performance in Training =  0.616717306889343
Average Performance in Validation =  0.5665909092958102
--------------------------------------------------------

M Value =  6
Lambda Value =  0.25

Fold  1

```
Performance Training =  0.5991623848210966
Performance Validation =  0.6529290744518184


Fold  2
Performance Training =  0.5817569948888208
Performance Validation =  0.6960632500692787


Fold  3
Performance Training =  0.5879730467655093
Performance Validation =  0.49837652406568356


Fold  4
Performance Training =  0.6911083604135803
Performance Validation =  0.4110946094608722


Average Performance in Training =  0.6150001967222518
Average Performance in Validation =  0.5646158645119133
------------------------------------------------------

M Value =  6
Lambda Value =  0.26


Fold  1
Performance Training =  0.5973612951860912
Performance Validation =  0.6509451084756932


Fold  2
Performance Training =  0.5799230297251587
Performance Validation =  0.6940686684422104


Fold  3
Performance Training =  0.5862936490786741
Performance Validation =  0.4955802676193959


Fold  4
Performance Training =  0.689728558939704
Performance Validation =  0.41008473021790814


Average Performance in Training =  0.613326633232407
Average Performance in Validation =  0.5626696936888019
------------------------------------------------------

M Value =  6
Lambda Value =  0.27


Fold  1
Performance Training =  0.5956154795531412
Performance Validation =  0.6489360556865238


Fold  2
Performance Training =  0.5781363245067794
Performance Validation =  0.6920965043809026


Fold  3
Performance Training =  0.5846537033229109
Performance Validation =  0.49284568546789675
```

```
Fold  4
Performance Training =  0.6883651182403735
Performance Validation =  0.4091229201793889

Average Performance in Training =  0.6116926564058013
Average Performance in Validation =  0.5607502914286779
----------------------------------------------------

M Value =  6
Lambda Value =  0.28

Fold  1
Performance Training =  0.5939200469432491
Performance Validation =  0.6469056246467115

Fold  2
Performance Training =  0.5763929541949204
Performance Validation =  0.6901450488188328

Fold  3
Performance Training =  0.5830497129045397
Performance Validation =  0.4901682525982848

Fold  4
Performance Training =  0.6870163841591753
Performance Validation =  0.4082040950931175

Average Performance in Training =  0.6100947745504711
Average Performance in Validation =  0.5588557552892366
----------------------------------------------------

M Value =  6
Lambda Value =  0.29

Fold  1
Performance Training =  0.5922706736049949
Performance Validation =  0.6448569544102618

Fold  2
Performance Training =  0.5746894390726502
Performance Validation =  0.688212800855298

Fold  3
Performance Training =  0.5814785796602707
Performance Validation =  0.4875439347241358

Fold  4
Performance Training =  0.6856809139005513
Performance Validation =  0.40732378823501225

Average Performance in Training =  0.6085299015596167
Average Performance in Validation =  0.556984369556177
----------------------------------------------------

M Value =  6
```

Lambda Value =  0.3

Fold  1
Performance Training =  0.5906635268704417
Performance Validation =  0.6427927247560498

Fold  2
Performance Training =  0.5730226867380164
Performance Validation =  0.686298442347482

Fold  3
Performance Training =  0.5799375527505346
Performance Validation =  0.4849691245586183

Fold  4
Performance Training =  0.6843574480243495
Performance Validation =  0.40647806451570767

Average Performance in Training =  0.6069953035958355
Average Performance in Validation =  0.5551345890444644
-------------------------------------------------------

M Value =  6
Lambda Value =  0.31

Fold  1
Performance Training =  0.5890952005916219
Performance Validation =  0.6407152424680989

Fold  2
Performance Training =  0.5713899425789952
Performance Validation =  0.6844008155555272

Fold  3
Performance Training =  0.5784241848841156
Performance Validation =  0.482440587590638

Fold  4
Performance Training =  0.683044886465031
Performance Validation =  0.4056634482678302

Average Performance in Training =  0.6054885536299409
Average Performance in Validation =  0.5533050234705236
-------------------------------------------------------

M Value =  6
Lambda Value =  0.32

Fold  1
Performance Training =  0.587562660194995
Performance Validation =  0.638626509289347

Fold  2
Performance Training =  0.5697887473561993
Performance Validation =  0.6825189035101211

```
Fold  3
Performance Training =  0.5769362947121912
Performance Validation =  0.4799554157698205


Fold  4
Performance Training =  0.6817422679429304
Performance Validation =  0.40487686224961905


Average Performance in Training =  0.604007492551579
Average Performance in Validation =  0.5514944227047269
----------------------------------------------------

M Value =  6
Lambda Value =  0.33

Fold  1
Performance Training =  0.5860631957556295
Performance Validation =  0.6365282757611193


Fold  2
Performance Training =  0.5682169007622748
Performance Validation =  0.6806518127903178


Fold  3
Performance Training =  0.5754719344297456
Performance Validation =  0.4775109878021192


Fold  4
Performance Training =  0.6804487522426867
Performance Validation =  0.4041155758952685


Average Performance in Training =  0.6025501957975842
Average Performance in Validation =  0.5497016630622061
----------------------------------------------------

M Value =  6
Lambda Value =  0.34

Fold  1
Performance Training =  0.5845943817843304
Performance Validation =  0.6344220841246648


Fold  2
Performance Training =  0.5666724300237413
Performance Validation =  0.6787987584245491


Fold  3
Performance Training =  0.5740293617856151
Performance Validation =  0.47510493499374407


Fold  4
Performance Training =  0.6791636049221337
Performance Validation =  0.40337716122781464


Average Performance in Training =  0.6011149446289552
Average Performance in Validation =  0.5479257346926931
```

```
----------------------------------------------------

M Value =  6
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.5831540426549805
Performance Validation =  0.6323093026965305

Fold  2
Performance Training =  0.5651535627708975
Performance Validation =  0.6769590506557346

Fold  3
Performance Training =  0.5726070158361136
Performance Validation =  0.47273511177024385

Fold  4
Performance Training =  0.6778861840872457
Performance Validation =  0.4026594551529067

Average Performance in Training =  0.5997002013373093
Average Performance in Validation =  0.5461657300688539
----------------------------------------------------

M Value =  6
Lambda Value =  0.36

Fold  1
Performance Training =  0.5817402227880231
Performance Validation =  0.6301911535607214

Fold  2
Performance Training =  0.5636587035318017
Performance Validation =  0.6751320833394148

Fold  3
Performance Training =  0.5712034958868555
Performance Validation =  0.4703995701499183

Fold  4
Performance Training =  0.6766159289282087
Performance Validation =  0.4019605270907174

Average Performance in Training =  0.5983045877837222
Average Performance in Validation =  0.544420833535193
----------------------------------------------------

M Value =  6
Lambda Value =  0.37

Fold  1
Performance Training =  0.5803511608586791
Performance Validation =  0.6280687349946069

Fold  2
```

```
Performance Training = 0.5621864133129169
Performance Validation = 0.6733173237705228


Fold  3
Performance Training = 0.5698175431576202
Performance Validation = 0.46809653757393643


Fold  4
Performance Training = 0.6753523497607131
Performance Validation = 0.40127865109320016


Average Performance in Training = 0.5969268667724823
Average Performance in Validation = 0.5426903118580666
------------------------------------------------------

M Value = 6
Lambda Value = 0.38

Fold  1
Performance Training = 0.5789852674225319
Performance Validation = 0.6259430397242444


Fold  2
Performance Training = 0.5607353918165339
Performance Validation = 0.6715143037590802


Fold  3
Performance Training = 0.5684480247795232
Performance Validation = 0.4658243975958386


Fold  4
Performance Training = 0.6740950193571007
Performance Validation = 0.40061228174572705


Average Performance in Training = 0.5955659258439223
Average Performance in Validation = 0.5409735057062225
------------------------------------------------------

M Value = 6
Lambda Value = 0.39

Fold  1
Performance Training = 0.5776411054522458
Performance Validation = 0.6238149698609565


Fold  2
Performance Training = 0.5593044619171113
Performance Validation = 0.6697226117973729


Fold  3
Performance Training = 0.5670939197952842
Performance Validation = 0.4635816730147868


Fold  4
Performance Training = 0.6728435653855922
Performance Validation = 0.3999600332742478
```

```
Average Performance in Training =  0.5942207631375584
Average Performance in Validation =  0.539269821986841
------------------------------------------------------

M Value =  6
Lambda Value =  0.4

Fold  1
Performance Training =  0.5763173733619973
Performance Validation =  0.6216853491848695

Fold  2
Performance Training =  0.5578925560781884
Performance Validation =  0.6679418861810797

Fold  3
Performance Training =  0.5657543068844473
Performance Validation =  0.4613670111040584

Fold  4
Performance Training =  0.6715976638037752
Performance Validation =  0.3993206613777771

Average Performance in Training =  0.592890475032102
Average Performance in Validation =  0.5375787269619462
------------------------------------------------------

M Value =  6
Lambda Value =  0.41000000000000003

Fold  1
Performance Training =  0.5750128901642284
Performance Validation =  0.619554933298204

Fold  2
Performance Training =  0.5564987044408615
Performance Validation =  0.666171808964399

Fold  3
Performance Training =  0.5644283535778643
Performance Validation =  0.4591791706414897

Fold  4
Performance Training =  0.6703570330758073
Performance Validation =  0.3986930473861693

Average Performance in Training =  0.5915742453146904
Average Performance in Validation =  0.5358997400725655
------------------------------------------------------

M Value =  6
Lambda Value =  0.42

Fold  1
Performance Training =  0.573726582459439
```

Performance Validation =  0.6174244180607718

Fold  2
Performance Training =  0.5551220243558153
Performance Validation =  0.6644121006446793

Fold  3
Performance Training =  0.5631153067611714
Performance Validation =  0.45701701049413623

Fold  4
Performance Training =  0.6691214291022672
Performance Validation =  0.3980761844085665

Average Performance in Training =  0.5902713356696732
Average Performance in Validation =  0.5342324284020384
------------------------------------------------------

M Value =  6
Lambda Value =  0.43

Fold  1
Performance Training =  0.5724574730061727
Performance Validation =  0.6152944466345238

Fold  2
Performance Training =  0.5537617111651147
Performance Validation =  0.6626625154855424

Fold  3
Performance Training =  0.5618144842966268
Performance Validation =  0.4548794795473149

Fold  4
Performance Training =  0.6678906407679166
Performance Validation =  0.39746916519153686

Average Performance in Training =  0.5889810773089577
Average Performance in Validation =  0.5325764017147295
------------------------------------------------------

M Value =  6
Lambda Value =  0.44

Fold  1
Performance Training =  0.5712046706569094
Performance Validation =  0.6131656153972951

Fold  2
Performance Training =  0.5524170300685727
Performance Validation =  0.6609228373992673

Fold  3
Performance Training =  0.560525267617539
Performance Validation =  0.45276560779962405

```
Fold  4
Performance Training =  0.6666644860263351
Performance Validation =  0.3968711714500862

Average Performance in Training =  0.587702863592339
Average Performance in Validation =  0.5309313080115682
------------------------------------------------------

M Value =  6
Lambda Value =  0.45

Fold  1
Performance Training =  0.5699673614777119
Performance Validation =  0.6110384789335515

Fold  2
Performance Training =  0.5510873089335249
Performance Validation =  0.659192876319418

Fold  3
Performance Training =  0.5592470951704253
Performance Validation =  0.45067449847190066

Fold  4
Performance Training =  0.665442808451991
Performance Validation =  0.3962814644712578

Average Performance in Training =  0.5864361435084133
Average Performance in Validation =  0.529296829549032
------------------------------------------------------

M Value =  6
Lambda Value =  0.46

Fold  1
Performance Training =  0.5687448008963347
Performance Validation =  0.6089135542688722

Fold  2
Performance Training =  0.5497719319270475
Performance Validation =  0.6574724650035964

Fold  3
Performance Training =  0.557979456597695
Performance Validation =  0.44860532100005457

Fold  4
Performance Training =  0.6642254742000488
Performance Validation =  0.39569937682032275

Average Performance in Training =  0.5851804159052816
Average Performance in Validation =  0.5276726792732114
------------------------------------------------------

M Value =  6
Lambda Value =  0.47000000000000003
```

```
Fold  1
Performance Training =  0.5675363067460284
Performance Validation =  0.6067913244823696

Fold  2
Performance Training =  0.5484703338667091
Performance Validation =  0.6557614562138907

Fold  3
Performance Training =  0.5567218875685673
Performance Validation =  0.4465573048003384

Fold  4
Performance Training =  0.6630123693225203
Performance Validation =  0.3951243050048585

Average Performance in Training =  0.5839352243759564
Average Performance in Validation =  0.5260585976253643
--------------------------------------------------

M Value =  6
Lambda Value =  0.48

Fold  1
Performance Training =  0.5663412530912295
Performance Validation =  0.6046722418055027

Fold  2
Performance Training =  0.5471819952003698
Performance Validation =  0.6540597202292828

Fold  3
Performance Training =  0.5554739651785954
Performance Validation =  0.4445297337111317

Fold  4
Performance Training =  0.6618033973963873
Performance Validation =  0.3945557029731107

Average Performance in Training =  0.5827001527166455
Average Performance in Validation =  0.524454349679757
--------------------------------------------------

M Value =  6
Lambda Value =  0.49

Fold  1
Performance Training =  0.5651590647373059
Performance Validation =  0.6025567302951839

Fold  2
Performance Training =  0.5459064375377993
Performance Validation =  0.6523671426500841

Fold  3
```

```
Performance Training =  0.5542353038489369
Performance Validation =  0.44252194102867026


Fold  4
Performance Training =  0.6605984774253216
Performance Validation =  0.3939930763407741


Average Performance in Training =  0.5814748208873409
Average Performance in Validation =  0.5228597225786781
------------------------------------------------------

M Value =  6
Lambda Value =  0.5

Fold  1
Performance Training =  0.5639892123400599
Performance Validation =  0.6004451881527124


Fold  2
Performance Training =  0.5446432196672895
Performance Validation =  0.6506836224594839


Fold  3
Performance Training =  0.5530055516656741
Performance Validation =  0.44053330506525556


Fold  4
Performance Training =  0.659397541981732
Performance Validation =  0.39343597725525836


Average Performance in Training =  0.5802588814136889
Average Performance in Validation =  0.5212745232331776
------------------------------------------------------

M Value =  6
Lambda Value =  0.51

Fold  1
Performance Training =  0.5628312080421742
Performance Validation =  0.5983379897468846


Fold  2
Performance Training =  0.5433919339993214
Performance Validation =  0.6490090703116773


Fold  3
Performance Training =  0.5517843871073351
Performance Validation =  0.438563245168092


Fold  4
Performance Training =  0.6582005355602407
Performance Validation =  0.39288399981910105


Average Performance in Training =  0.5790520161772679
Average Performance in Validation =  0.5196985762614388
------------------------------------------------------
```

```
M Value =  6
Lambda Value =  0.52

Fold  1
Performance Training =  0.5616846015735444
Performance Validation =  0.5962354873890722

Fold  2
Performance Training =  0.5421522033869559
Performance Validation =  0.6473434070198274

Fold  3
Performance Training =  0.5505715161154807
Performance Validation =  0.4366112181450301

Fold  4
Performance Training =  0.6570074131174561
Performance Validation =  0.3923367760048867

Average Performance in Training =  0.5778539335483592
Average Performance in Validation =  0.5181317221397042
------------------------------------------------------

M Value =  6
Lambda Value =  0.53

Fold  1
Performance Training =  0.5605489767607826
Performance Validation =  0.594138012899488

Fold  2
Performance Training =  0.5409236782791028
Performance Validation =  0.6456865622204184

Fold  3
Performance Training =  0.5493666694689852
Performance Validation =  0.4346767150504307

Fold  4
Performance Training =  0.6558181387761051
Performance Validation =  0.3917939720031013

Average Performance in Training =  0.5766643658212439
Average Performance in Validation =  0.5165738155433596
------------------------------------------------------

M Value =  6
Lambda Value =  0.54

Fold  1
Performance Training =  0.5594239483982928
Performance Validation =  0.5920458789969556

Fold  2
Performance Training =  0.5397060341684339
```

Performance Validation =  0.6440384731934246

Fold  3
Performance Training =  0.5481696004275973
Performance Validation =  0.432759258290364

Fold  4
Performance Training =  0.6546326846743886
Performance Validation =  0.3912552849520926

Average Performance in Training =  0.5754830669171782
Average Performance in Validation =  0.5150247238582092
------------------------------------------------------

M Value =  6
Lambda Value =  0.55

Fold  1
Performance Training =  0.5583091594394369
Performance Validation =  0.5899593805388972

Fold  2
Performance Training =  0.5384989693005104
Performance Validation =  0.6423990838202247

Fold  3
Performance Training =  0.5469800826146516
Performance Validation =  0.43085839901149336

Fold  4
Performance Training =  0.6534510299437997
Performance Validation =  0.39072044000591943

Average Performance in Training =  0.5743098103245996
Average Performance in Validation =  0.5134843258441337
------------------------------------------------------

M Value =  6
Lambda Value =  0.56

Fold  1
Performance Training =  0.5572042784715532
Performance Validation =  0.5878787956336218

Fold  2
Performance Training =  0.5373022026148444
Performance Validation =  0.6407683436633733

Fold  3
Performance Training =  0.5457979081124927
Performance Validation =  0.4289737147423909

Fold  4
Performance Training =  0.6522731598007258
Performance Validation =  0.3901891870153066

```
Average Performance in Training =  0.573144387249904
Average Performance in Validation =  0.5119525104352292
--------------------------------------------------------

M Value =  6
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.5561089974431139
Performance Validation =  0.5858043866433291

Fold  2
Performance Training =  0.5361154718922116
Performance Validation =  0.6391462071542326

Fold  3
Performance Training =  0.5446228857473756
Performance Validation =  0.4271048072598681

Fold  4
Performance Training =  0.6510990647389413
Performance Validation =  0.38966130159159607

Average Performance in Training =  0.5719866049554106
Average Performance in Validation =  0.5104291756622564
--------------------------------------------------------

M Value =  6
Lambda Value =  0.58

Fold  1
Performance Training =  0.5550230296152125
Performance Validation =  0.5837364010931139

Fold  2
Performance Training =  0.5349385320856352
Performance Validation =  0.6375326328761516

Fold  3
Performance Training =  0.5434548395433857
Performance Validation =  0.42525130065620553

Fold  4
Performance Training =  0.6499287398116613
Performance Validation =  0.3891365761134883

Average Performance in Training =  0.5708362852639737
Average Performance in Validation =  0.5089142276847398
--------------------------------------------------------

M Value =  6
Lambda Value =  0.59

Fold  1
Performance Training =  0.553946107712949
Performance Validation =  0.581675072498794
```

```
Fold  2
Performance Training =  0.5337711538151688
Performance Validation =  0.6359275829323137


Fold  3
Performance Training =  0.5422936073273412
Performance Validation =  0.4234128395860638


Fold  4
Performance Training =  0.6487621839931756
Performance Validation =  0.38861482466853825


Average Performance in Training =  0.5696932632121587
Average Performance in Validation =  0.5074075799214275
-----------------------------------------------------


M Value =  6
Lambda Value =  0.6


Fold  1
Performance Training =  0.5528779822552101
Performance Validation =  0.5796206211242887


Fold  2
Performance Training =  0.5326131220089446
Performance Validation =  0.6343310223886629


Fold  3
Performance Training =  0.5411390394687327
Performance Validation =  0.4215890876742766


Fold  4
Performance Training =  0.6475993996112646
Performance Validation =  0.3880958778888177


Average Performance in Training =  0.568557385836038
Average Performance in Validation =  0.5059091522690116
-----------------------------------------------------


M Value =  6
Lambda Value =  0.61


Fold  1
Performance Training =  0.5518184200438843
Performance Validation =  0.5775732546775625


Fold  2
Performance Training =  0.5314642346750091
Performance Validation =  0.6327429187834279


Fold  3
Performance Training =  0.5399909977406034
Performance Validation =  0.41977972606798


Fold  4
```

Performance Training =  0.6464403918426257
Performance Validation =  0.3875795820714122

Average Performance in Training =  0.5674285110755306
Average Performance in Validation =  0.5044188704000956
----------------------------------------------------

M Value =  6
Lambda Value =  0.62

Fold  1
Performance Training =  0.5507672027957675
Performance Validation =  0.5755331689527605

Fold  2
Performance Training =  0.5303243017902475
Performance Validation =  0.6311632416957444

Fold  3
Performance Training =  0.5388493542888766
Performance Validation =  0.41798445211837987

Fold  4
Performance Training =  0.6452851682644429
Performance Validation =  0.3870657977625127

Average Performance in Training =  0.5663065067848336
Average Performance in Validation =  0.5029366651323494
----------------------------------------------------

M Value =  6
Lambda Value =  0.63

Fold  1
Performance Training =  0.5497241259023498
Performance Validation =  0.5735005484249633

Fold  2
Performance Training =  0.5291931442942626
Performance Validation =  0.629591962366746

Fold  3
Performance Training =  0.5377139906990358
Performance Validation =  0.4162029781791303

Fold  4
Performance Training =  0.6441337384560131
Performance Validation =  0.3865543984756936

Average Performance in Training =  0.5651912498379152
Average Performance in Validation =  0.5014624718616333
----------------------------------------------------

M Value =  6
Lambda Value =  0.64

```
Fold  1
Performance Training =  0.548688997304351
Performance Validation =  0.571475566803032

Fold  2
Performance Training =  0.5280705931774452
Performance Validation =  0.6280290533672348

Fold  3
Performance Training =  0.5365847971503045
Performance Validation =  0.41443503050974073

Fold  4
Performance Training =  0.64298611364504
Performance Validation =  0.38604526953055596

Average Performance in Training =  0.5640826253192852
Average Performance in Validation =  0.4999962300526408
------------------------------------------------------

M Value =  6
Lambda Value =  0.65

Fold  1
Performance Training =  0.5476616364693678
Performance Validation =  0.5694583875451975

Fold  2
Performance Training =  0.5269564886536651
Performance Validation =  0.6264744883067275

Fold  3
Performance Training =  0.5354616716485547
Performance Validation =  0.4126803482736975

Fold  4
Performance Training =  0.6418423063938101
Performance Validation =  0.3855383069994618

Average Performance in Training =  0.5629805257913494
Average Performance in Validation =  0.4985378827812711
------------------------------------------------------

M Value =  6
Lambda Value =  0.66

Fold  1
Performance Training =  0.5466418734622744
Performance Validation =  0.5674491643413693

Fold  2
Performance Training =  0.525850679409078
Performance Validation =  0.6249282415792459

Fold  3
Performance Training =  0.5343445193301279
```

```
Performance Validation =  0.4109386826221597


Fold  4
Performance Training =  0.6407023303209964
Performance Validation =  0.3850334167514712


Average Performance in Training =  0.5618848506306192
Average Performance in Validation =  0.4970873763235615
------------------------------------------------------


M Value =  6
Lambda Value =  0.67


Fold  1
Performance Training =  0.5456295480991639
Performance Validation =  0.5654480415655756


Fold  2
Performance Training =  0.5247530219194625
Performance Validation =  0.6233902881417559


Fold  3
Performance Training =  0.5332332518295886
Performance Validation =  0.4092097958549511


Fold  4
Performance Training =  0.6395661998553144
Performance Validation =  0.3845305135837861


Average Performance in Training =  0.5607955054258824
Average Performance in Validation =  0.49564465978651717
------------------------------------------------------


M Value =  6
Lambda Value =  0.68


Fold  1
Performance Training =  0.5446245091766243
Performance Validation =  0.5634551547014656


Fold  2
Performance Training =  0.5236633798293268
Performance Validation =  0.6218606033215944


Fold  3
Performance Training =  0.5321277867051821
Performance Validation =  0.40749346065160263


Fold  4
Performance Training =  0.6384339300176564
Performance Validation =  0.38402952043207217


Average Performance in Training =  0.5597124014321974
Average Performance in Validation =  0.4942096847766837
------------------------------------------------------
```

M Value =  6
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.5436266137690143
Performance Validation =  0.561470630743417

Fold  2
Performance Training =  0.522581623386744
Performance Validation =  0.6203391626496546

Fold  3
Performance Training =  0.5310280469164211
Performance Validation =  0.4057894593658341

Fold  4
Performance Training =  0.6373055362287086
Performance Validation =  0.3835303676519545

Average Performance in Training =  0.5586354550752219
Average Performance in Validation =  0.4927824051027151
------------------------------------------------------

M Value =  6
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.5426357265871917
Performance Validation =  0.5594945885754294

Fold  2
Performance Training =  0.5215076289285148
Performance Validation =  0.6188259417164343

Fold  3
Performance Training =  0.5299339603488011
Performance Validation =  0.4040975833776027

Fold  4
Performance Training =  0.636181034139372
Performance Validation =  0.3830329923648078

Average Performance in Training =  0.5575645875009699
Average Performance in Validation =  0.4913627765085685
------------------------------------------------------

M Value =  6
Lambda Value =  0.71

Fold  1
Performance Training =  0.5416517193928364
Performance Validation =  0.5575271393297407

Fold  2
Performance Training =  0.5204412784108232
Performance Validation =  0.6173209160483856

Fold  3
Performance Training =  0.5288454593811722
Performance Validation =  0.4024176324974521


Fold  4
Performance Training =  0.6350604394815962
Performance Validation =  0.38253733786168553


Average Performance in Training =  0.556499724166607
Average Performance in Validation =  0.48995075643431596
------------------------------------------------------

M Value =  6
Lambda Value =  0.72


Fold  1
Performance Training =  0.5406744704631101
Performance Validation =  0.5555683867268123


Fold  2
Performance Training =  0.5193824589810521
Performance Validation =  0.61582406100228


Fold  3
Performance Training =  0.5277624804917447
Performance Validation =  0.4007494144184188


Fold  4
Performance Training =  0.6339437679374909
Performance Validation =  0.38204335305987547


Average Performance in Training =  0.5554407944683495
Average Performance in Validation =  0.4885463038018467
------------------------------------------------------

M Value =  6
Lambda Value =  0.73


Fold  1
Performance Training =  0.5397038641009504
Performance Validation =  0.5536184273981706


Fold  2
Performance Training =  0.5183310625868687
Performance Validation =  0.6143353516755503


Fold  3
Performance Training =  0.5266849638991159
Performance Validation =  0.399092744211208


Fold  4
Performance Training =  0.632831035024806
Performance Validation =  0.3815509920071375


Average Performance in Training =  0.5543877314029353

Average Performance in Validation =  0.48714937882301657
------------------------------------------------------

M Value =  6
Lambda Value =  0.74

Fold  1
Performance Training =  0.5387397901867642
Performance Validation =  0.5516773511933866

Fold  2
Performance Training =  0.5172869856190896
Performance Validation =  0.6128547628307941

Fold  3
Performance Training =  0.5256128532350656
Performance Validation =  0.39744744385881825

Fold  4
Performance Training =  0.6317222559970681
Performance Validation =  0.38106021342918317

Average Performance in Training =  0.5533404712594969
Average Performance in Validation =  0.4857599428280455
------------------------------------------------------

M Value =  6
Lambda Value =  0.75

Fold  1
Performance Training =  0.5377821437677157
Performance Validation =  0.5497452414723385

Fold  2
Performance Training =  0.5162501285851864
Performance Validation =  0.6113822688328194

Fold  3
Performance Training =  0.5245460952461958
Performance Validation =  0.3958133418271452

Fold  4
Performance Training =  0.6306174457568416
Performance Validation =  0.3805709803164099

Average Performance in Training =  0.5522989533389848
Average Performance in Validation =  0.48437795811217826
------------------------------------------------------

M Value =  6
Lambda Value =  0.76

Fold  1
Performance Training =  0.5368308246811904
Performance Validation =  0.5478221753837829

```
Fold  2
Performance Training =  0.5152203958105994
Performance Validation =  0.6099178435967956


Fold  3
Performance Training =  0.5234846395217736
Performance Validation =  0.39419027266840845


Fold  4
Performance Training =  0.6295166187807464
Performance Validation =  0.3800832595462894


Average Performance in Training =  0.5512631196985774
Average Performance in Validation =  0.483003387798819
-----------------------------------------------------

M Value =  6
Lambda Value =  0.77

Fold  1
Performance Training =  0.5358857372093457
Performance Validation =  0.5459082241311279


Fold  2
Performance Training =  0.5141976951653269
Performance Validation =  0.6084614605462124


Fold  3
Performance Training =  0.5224284382454003
Performance Validation =  0.39257807665460787


Fold  4
Performance Training =  0.6284197890549914
Performance Validation =  0.37959702153818564


Average Performance in Training =  0.5502329149187661
Average Performance in Validation =  0.48163619571753347
-----------------------------------------------------

M Value =  6
Lambda Value =  0.78

Fold  1
Performance Training =  0.5349467897619676
Performance Validation =  0.5440034532262401


Fold  2
Performance Training =  0.5131819378134768
Performance Validation =  0.6070130925795041


Fold  3
Performance Training =  0.5213774459683471
Performance Validation =  0.39097659943842034


Fold  4
Performance Training =  0.6273269700203319
```

Performance Validation =  0.3791122399376724

Average Performance in Training =  0.5492082858910309
Average Performance in Validation =  0.48027634629545923
-------------------------------------------------------

M Value =  6
Lambda Value =  0.79

Fold  1
Performance Training =  0.53401389458512
Performance Validation =  0.5421079227320007

Fold  2
Performance Training =  0.5121730379837222
Performance Validation =  0.6055727120443094

Fold  3
Performance Training =  0.5203316194026248
Performance Validation =  0.3893856917392351

Fold  4
Performance Training =  0.6262381745254433
Performance Validation =  0.3786288913277217

Average Performance in Training =  0.5481891816242276
Average Performance in Validation =  0.4789238044608167
-------------------------------------------------------

M Value =  6
Lambda Value =  0.8

Fold  1
Performance Training =  0.5330869674933167
Performance Validation =  0.5402216874942888

Fold  2
Performance Training =  0.5111709127587869
Performance Validation =  0.6041402907184592

Fold  3
Performance Training =  0.5192909172320219
Performance Validation =  0.3878052090522097

Fold  4
Performance Training =  0.6251534147878364
Performance Validation =  0.37814695496437845

Average Performance in Training =  0.5471755530679905
Average Performance in Validation =  0.4775785355573341
-------------------------------------------------------

M Value =  6
Lambda Value =  0.81

Fold  1

```
Performance Training = 0.5321659276231587
Performance Validation = 0.5383447973639799


Fold  2
Performance Training = 0.5101754818822605
Performance Validation = 0.6027157997968636


Fold  3
Performance Training = 0.5182552999395158
Performance Validation = 0.3862350113784494


Fold  4
Performance Training = 0.6240727023614983
Performance Validation = 0.3776664125347652


Average Performance in Training = 0.5461673529516083
Average Performance in Validation = 0.47624050526851447
-------------------------------------------------------

M Value =  6
Lambda Value = 0.8200000000000001

Fold  1
Performance Training = 0.5312506972065829
Performance Validation = 0.5364772974095237


Fold  2
Performance Training = 0.5091866675812199
Performance Validation = 0.6012992098835792


Fold  3
Performance Training = 0.5172247296496253
Performance Validation = 0.3846749629745745


Fold  4
Performance Training = 0.6229960481105485
Performance Validation = 0.37718724793547087


Average Performance in Training = 0.5451645356369942
Average Performance in Validation = 0.474909679550787
-------------------------------------------------------

M Value =  6
Lambda Value = 0.8300000000000001

Fold  1
Performance Training = 0.530341201362025
Performance Validation = 0.5346192281205838


Fold  2
Performance Training = 0.508204394403268
Performance Validation = 0.5998904909884009


Fold  3
Performance Training = 0.5161991699843795
Performance Validation = 0.3831249321200798
```

Fold  4
Performance Training =  0.6219234621882583
Performance Validation =  0.37670944706954546

Average Performance in Training =  0.5441670569844828
Average Performance in Validation =  0.4735860245746525
------------------------------------------------------

M Value =  6
Lambda Value =  0.84

Fold  1
Performance Training =  0.5294373679019813
Performance Validation =  0.5327706256032267

Fold  2
Performance Training =  0.5072285890667307
Performance Validation =  0.5984896125273942

Fold  3
Performance Training =  0.5151785859317294
Performance Validation =  0.38158479090108655

Fold  4
Performance Training =  0.6208549540208499
Performance Validation =  0.37623299766050455

Average Performance in Training =  0.5431748742303228
Average Performance in Validation =  0.472269506673053
------------------------------------------------------

M Value =  6
Lambda Value =  0.85

Fold  1
Performance Training =  0.5285391271555636
Performance Validation =  0.5309315217670569

Fold  2
Performance Training =  0.5062591803228722
Performance Validation =  0.5970965433268605

Fold  3
Performance Training =  0.5141629437253115
Performance Validation =  0.3800544150091304

Fold  4
Performance Training =  0.6197905322955526
Performance Validation =  0.3757578890818838

Average Performance in Training =  0.542187945874825
Average Performance in Validation =  0.4709600922962329
------------------------------------------------------

M Value =  6

```
Lambda Value =  0.86

Fold  1
Performance Training =  0.527646411804803
Performance Validation =  0.5291019445047119

Fold  2
Performance Training =  0.505296098829096
Performance Validation =  0.5957112516302581

Fold  3
Performance Training =  0.5131522107345907
Performance Validation =  0.3785336835538353

Fold  4
Performance Training =  0.6187302049524437
Performance Validation =  0.3752841122010172

Average Performance in Training =  0.5412062315802333
Average Performance in Validation =  0.46965774797245563
-----------------------------------------------------

M Value =  6
Lambda Value =  0.87

Fold  1
Performance Training =  0.5267591567335386
Performance Validation =  0.5272819178640811

Fold  2
Performance Training =  0.5043392770321878
Performance Validation =  0.5943337051076794

Fold  3
Performance Training =  0.5121463553644863
Performance Validation =  0.3770224788883715

Fold  4
Performance Training =  0.6176739791796451
Performance Validation =  0.37481165923583903

Average Performance in Training =  0.5402296920774645
Average Performance in Validation =  0.46836244027399276
-----------------------------------------------------

M Value =  6
Lambda Value =  0.88

Fold  1
Performance Training =  0.5258772988878586
Performance Validation =  0.5254714622135737

Fold  2
Performance Training =  0.503388649060748
Performance Validation =  0.5929638708675102
```

Fold  3
Performance Training =  0.5111453469636654
Performance Validation =  0.3755206864466758


Fold  4
Performance Training =  0.6166218614114982
Performance Validation =  0.3743405236236107


Average Performance in Training =  0.5392582890809425
Average Performance in Validation =  0.4670741357878426
----------------------------------------------------

M Value =  6
Lambda Value =  0.89

Fold  1
Performance Training =  0.5250007771471346
Performance Validation =  0.523670594400772


Fold  2
Performance Training =  0.5024441506260358
Performance Validation =  0.5916017154699469


Fold  3
Performance Training =  0.5101491557407742
Performance Validation =  0.3740281945915719


Fold  4
Performance Training =  0.6155738573293675
Performance Validation =  0.37387069990057475


Average Performance in Training =  0.538291985210828
Average Performance in Validation =  0.46579280109071636
----------------------------------------------------

M Value =  6
Lambda Value =  0.9

Fold  1
Performance Training =  0.5241295322047845
Performance Validation =  0.5218793279047577


Fold  2
Performance Training =  0.5015057189305157
Performance Validation =  0.5902472049420753


Fold  3
Performance Training =  0.5091577526879197
Performance Validation =  0.3725448944729193


Fold  4
Performance Training =  0.6145299718647652
Performance Validation =  0.3734021835916278


Average Performance in Training =  0.5373307439219963
Average Performance in Validation =  0.46451840272784495

```
--------------------------------------------------------

M Value =  6
Lambda Value =  0.91

Fold  1
Performance Training =  0.5232635064579749
Performance Validation =  0.5200976729823892

Fold  2
Performance Training =  0.500573292583463
Performance Validation =  0.5889003047942603

Fold  3
Performance Training =  0.5081711095107969
Performance Validation =  0.37107067989504694

Fold  4
Performance Training =  0.6134902092045136
Performance Validation =  0.3729349711091807

Average Performance in Training =  0.5363745294391871
Average Performance in Validation =  0.4632509071952193
--------------------------------------------------------

M Value =  6
Lambda Value =  0.92

Fold  1
Performance Training =  0.5224026439055354
Performance Validation =  0.5183256368088008

Fold  2
Performance Training =  0.49964681152304036
Performance Validation =  0.587560980037607

Fold  3
Performance Training =  0.5071891985648969
Performance Validation =  0.36960544719277366

Fold  4
Performance Training =  0.6124545727976981
Performance Validation =  0.37246905966044896

Average Performance in Training =  0.5354233066977927
Average Performance in Validation =  0.4619902809249076
--------------------------------------------------------

M Value =  6
Lambda Value =  0.93

Fold  1
Performance Training =  0.5215468900534301
Performance Validation =  0.5165632236123627

Fold  2
```

```
Performance Training =  0.4987262169443094
Performance Validation =  0.5862291952022965


Fold  3
Performance Training =  0.5062119927972833
Performance Validation =  0.3681490951153672


Fold  4
Performance Training =  0.6114230653641799
Performance Validation =  0.37200444716248093


Average Performance in Training =  0.5344770412898008
Average Performance in Validation =  0.4607364902731269
------------------------------------------------------

M Value =  6
Lambda Value =  0.9400000000000001


Fold  1
Performance Training =  0.520696191827181
Performance Validation =  0.5148104348043411


Fold  2
Performance Training =  0.49781145123268855
Performance Validation =  0.5849049143566117


Fold  3
Performance Training =  0.5052394656934689
Performance Validation =  0.3667015247178562


Fold  4
Performance Training =  0.6103956889044664
Performance Validation =  0.37154113216429296


Average Performance in Training =  0.5335356994144511
Average Performance in Validation =  0.4594895015107755
------------------------------------------------------

M Value =  6
Lambda Value =  0.9500000000000001


Fold  1
Performance Training =  0.5198504974906897
Performance Validation =  0.5130672691034779


Fold  2
Performance Training =  0.49690245790241083
Performance Validation =  0.5835881011264905


Fold  3
Performance Training =  0.5042715912289664
Performance Validation =  0.36526263925916835


Fold  4
Performance Training =  0.6093724447107531
Performance Validation =  0.3710791137755298
```

Average Performance in Training =  0.532599247833205
Average Performance in Validation =  0.45824928081616667
------------------------------------------------------

M Value =  6
Lambda Value =  0.96

Fold  1
Performance Training =  0.5190097565709577
Performance Validation =  0.511333722655702

Fold  2
Performance Training =  0.49599918153957145
Performance Validation =  0.5822787187154702

Fold  3
Performance Training =  0.5033083438251218
Performance Validation =  0.3638323441065733

Fold  4
Performance Training =  0.608353333378977
Performance Validation =  0.37061839160112475

Average Performance in Training =  0.531667653828657
Average Performance in Validation =  0.4570157942697176
------------------------------------------------------

M Value =  6
Lambda Value =  0.97

Fold  1
Performance Training =  0.5181739197882375
Performance Validation =  0.5096097891491684

Fold  2
Performance Training =  0.4951015677493963
Performance Validation =  0.5809767299248934

Fold  3
Performance Training =  0.5023496983088713
Performance Validation =  0.36241054664600103

Fold  4
Performance Training =  0.6073383548217244
Performance Validation =  0.370158965681473

Average Performance in Training =  0.5307408851670574
Average Performance in Validation =  0.45578900785038395
------------------------------------------------------

M Value =  6
Lambda Value =  0.98

Fold  1
Performance Training =  0.5173429389911927

```
Performance Validation =  0.5078954599248195


Fold  2
Performance Training =  0.4942095631073874
Performance Validation =  0.5796820971742658


Fold  3
Performance Training =  0.5013956298760962
Performance Validation =  0.36099715619779393


Fold  4
Performance Training =  0.6063275082818695
Performance Validation =  0.3697008364376708


Average Performance in Training =  0.5298189100641364
Average Performance in Validation =  0.4545688874336375
------------------------------------------------------


M Value =  6
Lambda Value =  0.99


Fold  1
Performance Training =  0.516516767096679
Performance Validation =  0.5061907240826367


Fold  2
Performance Training =  0.4933231151140334
Performance Validation =  0.5783947825216753


Fold  3
Performance Training =  0.500446114058275
Performance Validation =  0.35959208393752085


Fold  4
Performance Training =  0.6053207923468147
Performance Validation =  0.36924400462142126


Average Performance in Training =  0.5289016971539505
Average Performance in Validation =  0.45335539879081355
------------------------------------------------------


M Value =  6
Lambda Value =  1.0


Fold  1
Performance Training =  0.5156953580337913
Performance Validation =  0.5044955685837783


Fold  2
Performance Training =  0.4924421721528013
Performance Validation =  0.5771147476841749


Fold  3
Performance Training =  0.49950112669216007
Performance Validation =  0.35819524282149373
```

```
Fold  4
Performance Training =  0.6043182049632314
Performance Validation =  0.3687884712692261

Average Performance in Training =  0.5279892154604959
Average Performance in Validation =  0.4521485075896683
-------------------------------------------------------

M Value =  6
Lambda Value =  1.01

Fold  1
Performance Training =  0.514878666691843
Performance Validation =  0.5028099783487384

Fold  2
Performance Training =  0.49156668345114507
Performance Validation =  0.5758419540580697

Fold  3
Performance Training =  0.49856064389222166
Performance Validation =  0.3568065475166424

Fold  4
Performance Training =  0.6033197434522031
Performance Validation =  0.36833423766052154

Average Performance in Training =  0.5270814343718533
Average Performance in Validation =  0.45094817939599297
-------------------------------------------------------

M Value =  6
Lambda Value =  1.02

Fold  1
Performance Training =  0.514066648871986
Performance Validation =  0.5011339363517046

Fold  2
Performance Training =  0.4906965990442961
Performance Validation =  0.5745763627390359

Fold  3
Performance Training =  0.49762464202563805
Performance Validation =  0.35542591433447823

Fold  4
Performance Training =  0.6023254045246803
Performance Validation =  0.36788130527945007

Average Performance in Training =  0.5261783236166502
Average Performance in Validation =  0.4497543796761672
-------------------------------------------------------

M Value =  6
Lambda Value =  1.03
```

```
Fold  1
Performance Training =  0.5132592612421876
Performance Validation =  0.49946742371125474

Fold  2
Performance Training =  0.4898318697416074
Performance Validation =  0.5733179345420136

Fold  3
Performance Training =  0.4966930976896108
Performance Validation =  0.3540532611688242

Fold  4
Performance Training =  0.6013351842971786
Performance Validation =  0.36742967577997143

Average Performance in Training =  0.525279853242646
Average Performance in Validation =  0.4485670738005161
----------------------------------------------------

M Value =  6
Lambda Value =  1.04

Fold  1
Performance Training =  0.5124564612953146
Performance Validation =  0.4978104197775397

Fold  2
Performance Training =  0.48897244709526033
Performance Validation =  0.5720666300208346

Fold  3
Performance Training =  0.49576598769081737
Performance Validation =  0.3526885074370931

Fold  4
Performance Training =  0.6003490783076408
Performance Validation =  0.36697935095405076

Average Performance in Training =  0.5243859935972583
Average Performance in Validation =  0.4473862270473795
----------------------------------------------------

M Value =  6
Lambda Value =  1.05

Fold  1
Performance Training =  0.5116582073100893
Performance Validation =  0.4961629022160833

Fold  2
Performance Training =  0.48811828337114116
Performance Validation =  0.5708224094875365

Fold  3
```

```
Performance Training =  0.4948432890268205
Performance Validation =  0.35133157402484316


Fold  4
Performance Training =  0.5993670815314089
Performance Validation =  0.3665303327026799


Average Performance in Training =  0.523496715309865
Average Performance in Validation =  0.4462118046077857
------------------------------------------------------


M Value =  6
Lambda Value =  1.06


Fold  1
Performance Training =  0.5108644583147015
Performance Validation =  0.4945248470883381


Fold  2
Performance Training =  0.48726933152172014
Performance Validation =  0.5695852330313301


Fold  3
Performance Training =  0.49392497886927134
Performance Validation =  0.3499823832334099


Fold  4
Performance Training =  0.5983891883972492
Performance Validation =  0.3660826230095082


Average Performance in Training =  0.5226119892757355
Average Performance in Validation =  0.44504377159064656
------------------------------------------------------


M Value =  6
Lambda Value =  1.07


Fold  1
Performance Training =  0.5100751740528828
Performance Validation =  0.492896228929115


Fold  2
Performance Training =  0.4864255451607782
Performance Validation =  0.5683550605371923


Fold  3
Performance Training =  0.4930110345487573
Performance Validation =  0.3486408587304024


Fold  4
Performance Training =  0.5974153928033784
Performance Validation =  0.36563622391687345


Average Performance in Training =  0.5217317866414491
Average Performance in Validation =  0.44388209302839576
------------------------------------------------------
```

```
M Value =  6
Lambda Value =  1.08

Fold  1
Performance Training =  0.509290314952254
Performance Validation =  0.4912770208210122

Fold  2
Performance Training =  0.4855868785398366
Performance Validation =  0.5671318517040584

Fold  3
Performance Training =  0.4921014335411533
Performance Validation =  0.3473069255028688

Fold  4
Performance Training =  0.5964456881334527
Performance Validation =  0.3651911375040451

Average Performance in Training =  0.5208560787916742
Average Performance in Validation =  0.44272673388299616
------------------------------------------------------

M Value =  6
Lambda Value =  1.09

Fold  1
Performance Training =  0.5085098420947822
Performance Validation =  0.48966719446595697

Fold  2
Performance Training =  0.4847532865261588
Performance Validation =  0.5659155660625936

Fold  3
Performance Training =  0.4911961534553575
Performance Validation =  0.34598050981296946

Fold  4
Performance Training =  0.5954800672724785
Performance Validation =  0.3647473658675038

Average Performance in Training =  0.5199848373371943
Average Performance in Validation =  0.441577659052256
------------------------------------------------------

M Value =  7
Lambda Value =  0.01

Fold  1
Performance Training =  0.7030816341822412
Performance Validation =  0.4964857413518452

Fold  2
Performance Training =  0.6824230057394991
```

```
Performance Validation =  0.7561953931430879


Fold  3
Performance Training =  0.6732016892490986
Performance Validation =  0.633200616374082


Fold  4
Performance Training =  0.7490035300945356
Performance Validation =  0.5219621163884922


Average Performance in Training =  0.7019274648163436
Average Performance in Validation =  0.6019609668143768
------------------------------------------------------

M Value =  7
Lambda Value =  0.02

Fold  1
Performance Training =  0.6913805825618586
Performance Validation =  0.5126317089927193


Fold  2
Performance Training =  0.664384714039096
Performance Validation =  0.7522213570404699


Fold  3
Performance Training =  0.6598312306175698
Performance Validation =  0.6112501356860769


Fold  4
Performance Training =  0.739133858122855
Performance Validation =  0.49895991969107933


Average Performance in Training =  0.6886825963353449
Average Performance in Validation =  0.5937657803525863
------------------------------------------------------

M Value =  7
Lambda Value =  0.03

Fold  1
Performance Training =  0.6835601430883533
Performance Validation =  0.5407164163345113


Fold  2
Performance Training =  0.6550021828940671
Performance Validation =  0.7496323167834493


Fold  3
Performance Training =  0.6528074368455856
Performance Validation =  0.5992177132488672


Fold  4
Performance Training =  0.7342129964031644
Performance Validation =  0.48628293710902737
```

```
Average Performance in Training =  0.6813956898077926
Average Performance in Validation =  0.5939623458689638
-------------------------------------------------------


M Value =  7
Lambda Value =  0.04

Fold  1
Performance Training =  0.6771059450873788
Performance Validation =  0.5653313282460215

Fold  2
Performance Training =  0.6485254890484945
Performance Validation =  0.7474597243172506

Fold  3
Performance Training =  0.6478211501637472
Performance Validation =  0.5905664697794692

Fold  4
Performance Training =  0.7309042396402652
Performance Validation =  0.47744025126792156

Average Performance in Training =  0.6760892059849715
Average Performance in Validation =  0.5951994434026657
-------------------------------------------------------


M Value =  7
Lambda Value =  0.05

Fold  1
Performance Training =  0.6714417353319893
Performance Validation =  0.5851689771666007

Fold  2
Performance Training =  0.6434133455505242
Performance Validation =  0.7454245154456919

Fold  3
Performance Training =  0.6437788868389391
Performance Validation =  0.5835492728999426

Fold  4
Performance Training =  0.728325908687652
Performance Validation =  0.4706213061652309

Average Performance in Training =  0.6717399691022762
Average Performance in Validation =  0.5961910179193666
-------------------------------------------------------


M Value =  7
Lambda Value =  0.06

Fold  1
Performance Training =  0.6663593024206844
Performance Validation =  0.6009106056755159
```

```
Fold  2
Performance Training =  0.6390908794611105
Performance Validation =  0.7434491163991407


Fold  3
Performance Training =  0.6402866339439564
Performance Validation =  0.5775000987070735


Fold  4
Performance Training =  0.7261516453042856
Performance Validation =  0.4650803329521289


Average Performance in Training =  0.6679721152825092
Average Performance in Validation =  0.5967350384334648
----------------------------------------------------

M Value =  7
Lambda Value =  0.07


Fold  1
Performance Training =  0.6617501410347045
Performance Validation =  0.6134167885595729


Fold  2
Performance Training =  0.6352933956164415
Performance Validation =  0.7415129929017588


Fold  3
Performance Training =  0.6371669070965954
Performance Validation =  0.5721035194353871


Fold  4
Performance Training =  0.724232991108235
Performance Validation =  0.46043358354416697


Average Performance in Training =  0.6646108587139941
Average Performance in Validation =  0.5968667211102214
----------------------------------------------------

M Value =  7
Lambda Value =  0.08


Fold  1
Performance Training =  0.6575414491933942
Performance Validation =  0.6234106158390154


Fold  2
Performance Training =  0.6318786545037234
Performance Validation =  0.7396117942467255


Fold  3
Performance Training =  0.6343251290262869
Performance Validation =  0.5671857052525606


Fold  4
```

```
Performance Training =  0.7224917232864632
Performance Validation =  0.4564534274216622


Average Performance in Training =  0.6615592390024669
Average Performance in Validation =  0.596665385689991
----------------------------------------------------

M Value =  7
Lambda Value =  0.09

Fold  1
Performance Training =  0.6536773303712431
Performance Validation =  0.631449981163632

Fold  2
Performance Training =  0.6287605179420108
Performance Validation =  0.7377451002670079

Fold  3
Performance Training =  0.6317037384856887
Performance Validation =  0.562639532904935

Fold  4
Performance Training =  0.7208817054758687
Performance Validation =  0.4529912895919048

Average Performance in Training =  0.6587558230687028
Average Performance in Validation =  0.5962064759818699
----------------------------------------------------

M Value =  7
Lambda Value =  0.1

Fold  1
Performance Training =  0.6501121527183216
Performance Validation =  0.6379559818400329

Fold  2
Performance Training =  0.6258817631786381
Performance Validation =  0.7359127908190017

Fold  3
Performance Training =  0.6292638996048245
Performance Validation =  0.5583932228149153

Fold  4
Performance Training =  0.7193732046862737
Performance Validation =  0.4499435194838347

Average Performance in Training =  0.6561577550470146
Average Performance in Validation =  0.5955513787394462
----------------------------------------------------

M Value =  7
Lambda Value =  0.11
```

```
Fold  1
Performance Training =  0.6468076553590625
Performance Validation =  0.6432459359688841

Fold  2
Performance Training =  0.6232016067249113
Performance Validation =  0.7341141436738559

Fold  3
Performance Training =  0.6269773255138795
Performance Validation =  0.5543955598889123

Fold  4
Performance Training =  0.7179456820359523
Performance Validation =  0.4472342693028011

Average Performance in Training =  0.6537330674084514
Average Performance in Validation =  0.5947474772086133
------------------------------------------------------

M Value =  7
Lambda Value =  0.12

Fold  1
Performance Training =  0.6437313641047535
Performance Validation =  0.6475604165786211

Fold  2
Performance Training =  0.6206894181611532
Performance Validation =  0.7323477808561596

Fold  3
Performance Training =  0.6248222533889779
Performance Validation =  0.5506082372819627

Fold  4
Performance Training =  0.716584167289551
Performance Validation =  0.4448060419250073

Average Performance in Training =  0.6514568007361088
Average Performance in Validation =  0.5938306191604377
------------------------------------------------------

M Value =  7
Lambda Value =  0.13

Fold  1
Performance Training =  0.6408555399677045
Performance Validation =  0.6510834925428448

Fold  2
Performance Training =  0.6183212873449879
Performance Validation =  0.7306118410395579

Fold  3
Performance Training =  0.6227812855659254
```

Performance Validation = 0.5470015651870272

Fold 4
Performance Training = 0.715277292097413
Performance Validation = 0.4426140650336373

Average Performance in Training = 0.6493088512440077
Average Performance in Validation = 0.5928277409507668
------------------------------------------------------

M Value = 7
Lambda Value = 0.14

Fold 1
Performance Training = 0.6381563909817962
Performance Validation = 0.6539574579000293

Fold 2
Performance Training = 0.6160780120884565
Performance Validation = 0.7289041753991476

Fold 3
Performance Training = 0.6208401371785494
Performance Validation = 0.5435518998431528

Fold 4
Performance Training = 0.7140161503499551
Performance Validation = 0.44062273587250733

Average Performance in Training = 0.6472726726496892
Average Performance in Validation = 0.5917590672537093
------------------------------------------------------

M Value = 7
Lambda Value = 0.15

Fold 1
Performance Training = 0.6356134434736196
Performance Validation = 0.6562934788142634

Fold 2
Performance Training = 0.6139438422605319
Performance Validation = 0.7272225086639279

Fold 3
Performance Training = 0.6189868560205087
Performance Validation = 0.5402400131742272

Fold 4
Performance Training = 0.712793598237105
Performance Validation = 0.438803263609429

Average Performance in Training = 0.6453344349979413
Average Performance in Validation = 0.5906398160654619
------------------------------------------------------

```
M Value =  7
Lambda Value =  0.16

Fold  1
Performance Training =  0.6332090262115466
Performance Validation =  0.658179308978036

Fold  2
Performance Training =  0.6119056518341914
Performance Validation =  0.7255645560488364

Fold  3
Performance Training =  0.6172113048844081
Performance Validation =  0.5370500077531193

Fold  4
Performance Training =  0.7116038016522355
Performance Validation =  0.43713204351891244

Average Performance in Training =  0.6434824461455955
Average Performance in Validation =  0.589481479074726
------------------------------------------------------

M Value =  7
Lambda Value =  0.17

Fold  1
Performance Training =  0.630927842033713
Performance Validation =  0.6596849181572966

Fold  2
Performance Training =  0.6099523667247579
Performance Validation =  0.7239281018115827

Fold  3
Performance Training =  0.6155047989820148
Performance Validation =  0.53396856454341

Fold  4
Performance Training =  0.710441929986265
Performance Validation =  0.4355894992955458

Average Performance in Training =  0.6417067344316877
Average Performance in Validation =  0.5882927709519588
------------------------------------------------------

M Value =  7
Lambda Value =  0.18

Fold  1
Performance Training =  0.628756610248182
Performance Validation =  0.6608666336998639

Fold  2
Performance Training =  0.6080745533454417
Performance Validation =  0.7223110483498272
```

```
Fold  3
Performance Training =  0.613859840377004
Performance Validation =  0.5309844030664009


Fold  4
Performance Training =  0.709303940649533
Performance Validation =  0.43415923652433863


Average Performance in Training =  0.6399987361550401
Average Performance in Validation =  0.5870803304101077
------------------------------------------------------


M Value =  7
Lambda Value =  0.19


Fold  1
Performance Training =  0.6266837673175489
Performance Validation =  0.6617702164667739


Fold  2
Performance Training =  0.6062641127831847
Performance Validation =  0.7207114440456165


Fold  3
Performance Training =  0.6122699163621321
Performance Validation =  0.5280878826264179


Fold  4
Performance Training =  0.7081864222271463
Performance Validation =  0.4328274097623259


Average Performance in Training =  0.6383510546725031
Average Performance in Validation =  0.5858492382252836
------------------------------------------------------


M Value =  7
Lambda Value =  0.2


Fold  1
Performance Training =  0.6246992158588419
Performance Validation =  0.6624331672024589


Fold  2
Performance Training =  0.6045140472097126
Performance Validation =  0.7191274963788519


Fold  3
Performance Training =  0.610729341990606
Performance Validation =  0.5252707004882027


Fold  4
Performance Training =  0.7070864769872371
Performance Validation =  0.4315822403408619


Average Performance in Training =  0.6367572705115995
```

```
Average Performance in Validation =  0.5846034011025938
------------------------------------------------------

M Value =  7
Lambda Value =  0.21

Fold  1
Performance Training =  0.6227941137799727
Performance Validation =  0.6628864722031647

Fold  2
Performance Training =  0.6028182774478824
Performance Validation =  0.7175575751623582

Fold  3
Performance Training =  0.6092331343441133
Performance Validation =  0.5225256587178368

Fold  4
Performance Training =  0.7060016307121187
Performance Validation =  0.4304136430336425

Average Performance in Training =  0.6352117890710218
Average Performance in Validation =  0.5833458372792506
------------------------------------------------------

M Value =  7
Lambda Value =  0.22

Fold  1
Performance Training =  0.6209606967828989
Performance Validation =  0.6631559366912578

Fold  2
Performance Training =  0.6011714978704518
Performance Validation =  0.7160002093806775

Fold  3
Performance Training =  0.6077769103935566
Performance Validation =  0.5198464809312437

Fold  4
Performance Training =  0.7049297620789611
Performance Validation =  0.4293129329593517

Average Performance in Training =  0.633709716781467
Average Performance in Validation =  0.5820788899906327
------------------------------------------------------

M Value =  7
Lambda Value =  0.23

Fold  1
Performance Training =  0.6191921286214628
Performance Validation =  0.6632632122243056
```

```
Fold  2
Performance Training =  0.5995690592508542
Performance Validation =  0.7144540800732234


Fold  3
Performance Training =  0.6063568028909638
Performance Validation =  0.517227666140906


Fold  4
Performance Training =  0.703869046402667
Performance Validation =  0.42827259266028816


Average Performance in Training =  0.632246759291487
Average Performance in Validation =  0.5808043877746808
-----------------------------------------------------

M Value =  7
Lambda Value =  0.24

Fold  1
Performance Training =  0.6174823744658722
Performance Validation =  0.6632265949930872


Fold  2
Performance Training =  0.5980068730016219
Performance Validation =  0.7129180109415797


Fold  3
Performance Training =  0.6049693903554381
Performance Validation =  0.514664370719221


Fold  4
Performance Training =  0.7028179101758493
Performance Validation =  0.42728608500776366


Average Performance in Training =  0.6308191369996954
Average Performance in Validation =  0.5795237654154128
-----------------------------------------------------

M Value =  7
Lambda Value =  0.25

Fold  1
Performance Training =  0.6158260935288908
Performance Validation =  0.6630616510569453


Fold  2
Performance Training =  0.5964813320800035
Performance Validation =  0.7113909578173954


Fold  3
Performance Training =  0.6036116382774747
Performance Validation =  0.5121523120323624


Fold  4
Performance Training =  0.7017749938892819
```

```
Performance Validation =  0.4263477014793554

Average Performance in Training =  0.6294235144439128
Average Performance in Validation =  0.5782381555965146
------------------------------------------------------

M Value =  7
Lambda Value =  0.26

Fold  1
Performance Training =  0.6142185477756135
Performance Validation =  0.6627817097548959

Fold  2
Performance Training =  0.5949892450843779
Performance Validation =  0.7098719977449708

Fold  3
Performance Training =  0.6022808493846488
Performance Validation =  0.5096876890216988

Fold  4
Performance Training =  0.7007391213130552
Performance Validation =  0.42545243806612354

Average Performance in Training =  0.6280569408894239
Average Performance in Validation =  0.5769484586469222
------------------------------------------------------

M Value =  7
Lambda Value =  0.27

Fold  1
Performance Training =  0.612655524090188
Performance Validation =  0.6623982558972452

Fold  2
Performance Training =  0.5935277809275962
Performance Validation =  0.7083603181664786

Fold  3
Performance Training =  0.6009746213142612
Performance Validation =  0.5072671162088964

Fold  4
Performance Training =  0.6997092738939339
Performance Validation =  0.4245958929937872

Average Performance in Training =  0.6267168000564949
Average Performance in Validation =  0.5756553958166019
------------------------------------------------------

M Value =  7
Lambda Value =  0.28

Fold  1
```

```
Performance Training =  0.611133267727497
Performance Validation =  0.6619212436412694


Fold  2
Performance Training =  0.5920944220863386
Performance Validation =  0.7068552065141673


Fold  3
Performance Training =  0.5996908104002918
Performance Validation =  0.5048875684527812


Fold  4
Performance Training =  0.6986845692563981
Performance Validation =  0.4237741818320453


Average Performance in Training =  0.6254007673676314
Average Performance in Validation =  0.5743595501100658
------------------------------------------------------

M Value =  7
Lambda Value =  0.29


Fold  1
Performance Training =  0.6096484252518363
Performance Validation =  0.6613593493293223


Fold  2
Performance Training =  0.5906869248708957
Performance Validation =  0.7053560403885157


Fold  3
Performance Training =  0.5984275005490503
Performance Validation =  0.5025463344030725


Fold  4
Performance Training =  0.6976642430318938
Performance Validation =  0.4229838665850183


Average Performance in Training =  0.624106773425919
Average Performance in Validation =  0.5730613976764822
------------------------------------------------------

M Value =  7
Lambda Value =  0.3


Fold  1
Performance Training =  0.6081979954719166
Performance Validation =  0.6607201764249001


Fold  2
Performance Training =  0.5893032854896951
Performance Validation =  0.7038622784166069


Fold  3
Performance Training =  0.597182976379359
Performance Validation =  0.5002409770505419
```

```
Fold  4
Performance Training =  0.6966476334134468
Performance Validation =  0.4222218961124634

Average Performance in Training =  0.6228329726886044
Average Performance in Validation =  0.5717613320011281
--------------------------------------------------

M Value =  7
Lambda Value =  0.31

Fold  1
Performance Training =  0.6067792871339952
Performance Validation =  0.6600104226063701

Fold  2
Performance Training =  0.5879417109315894
Performance Validation =  0.702373451828632

Fold  3
Performance Training =  0.5959556999579162
Performance Validation =  0.4979693001129968

Fold  4
Performance Training =  0.6956341679608338
Performance Validation =  0.4214855558004348

Average Performance in Training =  0.6215777164960836
Average Performance in Validation =  0.5704596825871084
--------------------------------------------------

M Value =  7
Lambda Value =  0.32

Fold  1
Performance Training =  0.6053898823423832
Performance Validation =  0.6592360167769443

Fold  2
Performance Training =  0.5866005938792668
Performance Validation =  0.7008891567537366

Fold  3
Performance Training =  0.594744290581342
Performance Validation =  0.4957293192543324

Fold  4
Performance Training =  0.6946233522780025
Performance Validation =  0.42077242483267596

Average Performance in Training =  0.6203395297702486
Average Performance in Validation =  0.5691567294044223
--------------------------------------------------

M Value =  7
```

Lambda Value =  0.33

Fold  1
Performance Training =  0.604027604847267
Performance Validation =  0.6584022320149694

Fold  2
Performance Training =  0.5852784910147961
Performance Validation =  0.6994090472132222

Fold  3
Performance Training =  0.593547507151985
Performance Validation =  0.49351923733159053

Fold  4
Performance Training =  0.6936147602582359
Performance Validation =  0.4200803397463103

Average Performance in Training =  0.619117090818071
Average Performance in Validation =  0.567852714076523
------------------------------------------------------

M Value =  7
Lambda Value =  0.34

Fold  1
Performance Training =  0.6026904924804019
Performance Validation =  0.657513779172008

Fold  2
Performance Training =  0.5839741041941904
Performance Validation =  0.6979328287751969

Fold  3
Performance Training =  0.5923642327710548
Performance Validation =  0.4913374230185824

Fold  4
Performance Training =  0.6926080256497524
Performance Validation =  0.41940736321302396

Average Performance in Training =  0.6179092137738499
Average Performance in Validation =  0.5665478485447029
------------------------------------------------------

M Value =  7
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.6013767731352971
Performance Validation =  0.6565748848198465

Fold  2
Performance Training =  0.5826862640597873
Performance Validation =  0.6964602528271127

Fold  3
Performance Training =  0.5911934612343925
Performance Validation =  0.48918239227501314

Fold  4
Performance Training =  0.6916028347392547
Performance Validation =  0.41875175718832114

Average Performance in Training =  0.6167148332921829
Average Performance in Validation =  0.5652423217775734
----------------------------------------------------

M Value =  7
Lambda Value =  0.36

Fold  1
Performance Training =  0.6000848437845058
Performance Validation =  0.6555893564735146

Fold  2
Performance Training =  0.5814139157327898
Performance Validation =  0.6949911114191916

Fold  3
Performance Training =  0.5900342851664844
Performance Validation =  0.4870527922252491

Fold  4
Performance Training =  0.690598919986472
Performance Validation =  0.4181119597302022

Average Performance in Training =  0.615532991167563
Average Performance in Validation =  0.5639363049620394
----------------------------------------------------

M Value =  7
Lambda Value =  0.37

Fold  1
Performance Training =  0.5988132521062162
Performance Validation =  0.6545606374181121

Fold  2
Performance Training =  0.5801561062876732
Performance Validation =  0.6935252326310488

Fold  3
Performance Training =  0.5888858855695589
Performance Validation =  0.48494738708683305

Fold  4
Performance Training =  0.6895960544711266
Performance Validation =  0.4174865649145948

Average Performance in Training =  0.6143628246086437
Average Performance in Validation =  0.5626299555126472

```
--------------------------------------------------------

M Value =  7
Lambda Value =  0.38

Fold  1
Performance Training =  0.5975606803584651
Performance Validation =  0.6534918530006569

Fold  2
Performance Training =  0.5789119737584021
Performance Validation =  0.6920624764149146

Fold  3
Performance Training =  0.5877475225986453
Performance Validation =  0.4828650458499514

Fold  4
Performance Training =  0.6885940470366668
Performance Validation =  0.416874305375603

Average Performance in Training =  0.6132035559380449
Average Performance in Validation =  0.5613234201602815
--------------------------------------------------------

M Value =  7
Lambda Value =  0.39

Fold  1
Performance Training =  0.5963259311943757
Performance Validation =  0.6523858498826582

Fold  2
Performance Training =  0.5776807374658821
Performance Validation =  0.6906027308710125

Fold  3
Performance Training =  0.5866185274017093
Performance Validation =  0.48080473145840874

Fold  4
Performance Training =  0.6875927380337168
Performance Validation =  0.4162740370796356

Average Performance in Training =  0.612054483523921
Average Performance in Validation =  0.5600168373229288
--------------------------------------------------------

M Value =  7
Lambda Value =  0.4

Fold  1
Performance Training =  0.5951079151578332
Performance Validation =  0.6512452294613758

Fold  2
```

Performance Training = 0.5764616894885523
Performance Validation = 0.6891459089134446


Fold  3
Performance Training = 0.5854982948875112
Performance Validation = 0.4787654912828946


Fold  4
Performance Training = 0.6865919955814102
Performance Validation = 0.4156847260080292


Average Performance in Training = 0.6109149737788266
Average Performance in Validation = 0.5587103389164361
------------------------------------------------------

M Value = 7
Lambda Value = 0.41000000000000003

Fold  1
Performance Training = 0.5939056396375263
Performance Validation = 0.6500723764398675


Fold  2
Performance Training = 0.5752541871249197
Performance Validation = 0.6876919452880008


Fold  3
Performance Training = 0.584386277303582
Performance Validation = 0.4767464487103955


Fold  4
Performance Training = 0.6855917122773181
Performance Validation = 0.41510543647609444


Average Performance in Training = 0.6097844540858366
Average Performance in Validation = 0.5574040517285895
------------------------------------------------------

M Value = 7
Lambda Value = 0.42

Fold  1
Performance Training = 0.5927181990896239
Performance Validation = 0.6488694833446738


Fold  2
Performance Training = 0.5740576462191807
Performance Validation = 0.6862407939064941


Fold  3
Performance Training = 0.5832819785232595
Performance Validation = 0.474746795700531


Fold  4
Performance Training = 0.6845918022970453
Performance Validation = 0.41453532086014955

Average Performance in Training =  0.6086624065322773
Average Performance in Validation =  0.5560980984529621
------------------------------------------------------

M Value =  7
Lambda Value =  0.43

Fold  1
Performance Training =  0.5915447663665772
Performance Validation =  0.6476385716450923

Fold  2
Performance Training =  0.5728715352397642
Performance Validation =  0.6847924254653434

Fold  3
Performance Training =  0.5821849489547579
Performance Validation =  0.472765786182336

Fold  4
Performance Training =  0.6835921988332176
Performance Validation =  0.41397361053991855

Average Performance in Training =  0.6075483623485792
Average Performance in Validation =  0.5547925984581725
------------------------------------------------------

M Value =  7
Lambda Value =  0.44

Fold  1
Performance Training =  0.5903845850124987
Performance Validation =  0.6463815100115933

Fold  2
Performance Training =  0.5716953700162992
Performance Validation =  0.6833468253191338

Fold  3
Performance Training =  0.581094780997081
Performance Validation =  0.47080273018344654

Fold  4
Performance Training =  0.6825928518307818
Performance Validation =  0.4134196078933132

Average Performance in Training =  0.6064418969641652
Average Performance in Validation =  0.5534876683518717
------------------------------------------------------

M Value =  7
Lambda Value =  0.45

Fold  1
Performance Training =  0.5892369624050099

Performance Validation =  0.6451000301570159

Fold  2
Performance Training =  0.5705287090536925
Performance Validation =  0.6819039915827008

Fold  3
Performance Training =  0.5800111049776691
Performance Validation =  0.4688569885994305

Fold  4
Performance Training =  0.6815937259816313
Performance Validation =  0.41287267920512016

Average Performance in Training =  0.6053426256045007
Average Performance in Validation =  0.5521834223860669
----------------------------------------------------

M Value =  7
Lambda Value =  0.46

Fold  1
Performance Training =  0.5881012636399268
Performance Validation =  0.6437957406281358

Fold  2
Performance Training =  0.5693711493531761
Performance Validation =  0.6804639334379134

Fold  3
Performance Training =  0.5789335855152604
Performance Validation =  0.4669279685239859

Fold  4
Performance Training =  0.680594798946656
Performance Validation =  0.41233224837159865

Average Performance in Training =  0.6042501993637548
Average Performance in Validation =  0.5508799727404085
----------------------------------------------------

M Value =  7
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.5869769060691596
Performance Validation =  0.6424701388532574

Fold  2
Performance Training =  0.5682223226796352
Performance Validation =  0.6790266696237317

Fold  3
Performance Training =  0.5778619182587877
Performance Validation =  0.465015119071841

```
Fold  4
Performance Training =  0.6795960597776662
Performance Validation =  0.4117977913000551

Average Performance in Training =  0.6031643016963122
Average Performance in Validation =  0.5495774297122213
------------------------------------------------------

M Value =  7
Lambda Value =  0.48

Fold  1
Performance Training =  0.58586335441416
Performance Validation =  0.6411246217009645

Fold  2
Performance Training =  0.5670818922225724
Performance Validation =  0.6775922270903245

Fold  3
Performance Training =  0.5767958269594153
Performance Validation =  0.46311792763541515

Fold  4
Performance Training =  0.6785975075152986
Performance Validation =  0.4112688309168403

Average Performance in Training =  0.6020846452778617
Average Performance in Validation =  0.5482759018358861
------------------------------------------------------

M Value =  7
Lambda Value =  0.49

Fold  1
Performance Training =  0.5847601163874394
Performance Validation =  0.6397604947636741

Fold  2
Performance Training =  0.565949549604956
Performance Validation =  0.676160639800009

Fold  3
Performance Training =  0.5757350608382403
Performance Validation =  0.46123591652428664

Fold  4
Performance Training =  0.6775991499421653
Performance Validation =  0.4107449327092598

Average Performance in Training =  0.6010109691932003
Average Performance in Validation =  0.5469754959493074
------------------------------------------------------

M Value =  7
Lambda Value =  0.5
```

```
Fold  1
Performance Training =  0.5836667387634321
Performance Validation =  0.6383789805455449

Fold  2
Performance Training =  0.5648250122000602
Performance Validation =  0.6747319476595985

Fold  3
Performance Training =  0.5746793922168285
Performance Validation =  0.4593686399431778

Fold  4
Performance Training =  0.6766010024731677
Performance Validation =  0.41022570073714737

Average Performance in Training =  0.5999430364133721
Average Performance in Validation =  0.5456763172213671
----------------------------------------------------

M Value =  7
Lambda Value =  0.51

Fold  1
Performance Training =  0.5825828038474679
Performance Validation =  0.6369812257060934

Fold  2
Performance Training =  0.5637080207214669
Performance Validation =  0.673306195570335

Fold  3
Performance Training =  0.5736286143817844
Performance Validation =  0.457515681269943

Fold  4
Performance Training =  0.6756030871672141
Performance Validation =  0.409710774058467

Average Performance in Training =  0.5988806315294832
Average Performance in Validation =  0.5443784691512096
----------------------------------------------------

M Value =  7
Lambda Value =  0.52

Fold  1
Performance Training =  0.5815079262980791
Performance Validation =  0.6355683074875431

Fold  2
Performance Training =  0.5625983370557468
Performance Validation =  0.6718834325830718

Fold  3
```

Performance Training =  0.572582539658C286
Performance Validation =  0.4556766505998975


Fold  4
Performance Training =  0.6746054318465362
Performance Validation =  0.4091998235207118


Average Performance in Training =  0.5978235587145977
Average Performance in Validation =  0.543082053547806
-------------------------------------------------------


M Value =  7
Lambda Value =  0.53


Fold  1
Performance Training =  0.5804417502634287
Performance Validation =  0.6341412394344825


Fold  2
Performance Training =  0.5614957423110734
Performance Validation =  0.6704637111476455


Fold  3
Performance Training =  0.5715409976684844
Performance Validation =  0.4538511825271525


Fold  4
Performance Training =  0.6736080693115245
Performance Validation =  0.4086925488761318


Average Performance in Training =  0.5967716398886278
Average Performance in Validation =  0.541787170496353
-------------------------------------------------------


M Value =  7
Lambda Value =  0.54


Fold  1
Performance Training =  0.5793839467974443
Performance Validation =  0.6327009764982361


Fold  2
Performance Training =  0.5604000350582813
Performance Validation =  0.6690470864465682


Fold  3
Performance Training =  0.5705038337604906
Performance Validation =  0.4520389341371136


Fold  4
Performance Training =  0.6726110366404547
Performance Validation =  0.40818867618421373


Average Performance in Training =  0.5957247130641677
Average Performance in Validation =  0.5404939183165329
-------------------------------------------------------

```
M Value =  7
Lambda Value =  0.55

Fold  1
Performance Training =  0.5783342115254191
Performance Validation =  0.6312484196047854

Fold  2
Performance Training =  0.5593110297436783
Performance Validation =  0.6676336158042006

Fold  3
Performance Training =  0.5694709075815454
Performance Validation =  0.45023958318756385

Fold  4
Performance Training =  0.6716143745647729
Performance Validation =  0.40768795546943815

Average Performance in Training =  0.594682630853854
Average Performance in Validation =  0.5392023935164969
------------------------------------------------------

M Value =  7
Lambda Value =  0.56

Fold  1
Performance Training =  0.5772922625324362
Performance Validation =  0.6297844197536885

Fold  2
Performance Training =  0.5582285552553714
Performance Validation =  0.6662233581635029

Fold  3
Performance Training =  0.568442091788983
Performance Validation =  0.4484528264583524

Fold  4
Performance Training =  0.6706181269116969
Performance Validation =  0.4071901586063261

Average Performance in Training =  0.5936452591221218
Average Performance in Validation =  0.5379126907454675
------------------------------------------------------

M Value =  7
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.5762578384511203
Performance Validation =  0.6283097817058905

Fold  2
Performance Training =  0.5571524536269844
```

```
Performance Validation =  0.6648163736232959


Fold  3
Performance Training =  0.5674172708799289
Performance Validation =  0.44667837825215395


Fold  4
Performance Training =  0.6696223401068718
Performance Validation =  0.40669507740719313


Average Performance in Training =  0.5926124757662264
Average Performance in Validation =  0.5366249027471334
------------------------------------------------------

M Value =  7
Lambda Value =  0.58

Fold  1
Performance Training =  0.5752306967279519
Performance Validation =  0.6268252673102153


Fold  2
Performance Training =  0.5560825788645067
Performance Validation =  0.6634127230297033


Fold  3
Performance Training =  0.5663963401294014
Performance Validation =  0.4449159690307295


Fold  4
Performance Training =  0.6686270627306482
Performance Validation =  0.4062025218910045


Average Performance in Training =  0.5915841696131271
Average Performance in Validation =  0.5353391203154132
------------------------------------------------------

M Value =  7
Lambda Value =  0.59

Fold  1
Performance Training =  0.5742106120497568
Performance Validation =  0.62533159851149


Fold  2
Performance Training =  0.5550187958836239
Performance Validation =  0.6620124676161149


Fold  3
Performance Training =  0.5653792046257726
Performance Validation =  0.4431653441729858


Fold  4
Performance Training =  0.6676323451222917
Performance Validation =  0.4057123187142836
```

Average Performance in Training =  0.5905602394203613
Average Performance in Validation =  0.5340554322537185
----------------------------------------------------

M Value =  7
Lambda Value =  0.6

Fold  1
Performance Training =  0.5731973749140852
Performance Validation =  0.6238294600774417

Fold  2
Performance Training =  0.553960979546312
Performance Validation =  0.6606156686866008

Fold  3
Performance Training =  0.5643657783939817
Performance Validation =  0.44142626284257525

Fold  4
Performance Training =  0.6666382390270732
Performance Validation =  0.4052243097472522

Average Performance in Training =  0.589540592970363
Average Performance in Validation =  0.5327739253384675
----------------------------------------------------

M Value =  7
Lambda Value =  0.61

Fold  1
Performance Training =  0.5721907903290013
Performance Validation =  0.6223195020765604

Fold  2
Performance Training =  0.5529090137867083
Performance Validation =  0.6592223873382324

Fold  3
Performance Training =  0.5633559835979204
Performance Validation =  0.4396984969542589

Fold  4
Performance Training =  0.6656447972817553
Performance Validation =  0.4047383507803354

Average Performance in Training =  0.5885251462488463
Average Performance in Validation =  0.5314946842873468
----------------------------------------------------

M Value =  7
Lambda Value =  0.62

Fold  1
Performance Training =  0.5711906766294192
Performance Validation =  0.6208023421349124

```
Fold  2
Performance Training =  0.5518627908173765
Performance Validation =  0.6578326842182408

Fold  3
Performance Training =  0.5623497498143417
Performance Validation =  0.4379818302293511

Fold  4
Performance Training =  0.6646520735344876
Performance Validation =  0.40425431034783577

Average Performance in Training =  0.5875138226989063
Average Performance in Validation =  0.530217791732585
----------------------------------------------------

M Value =  7
Lambda Value =  0.63

Fold  1
Performance Training =  0.5701968643985227
Performance Validation =  0.6192785674962634

Fold  2
Performance Training =  0.5508222104080411
Performance Validation =  0.6564466193123729

Fold  3
Performance Training =  0.5613470133714359
Performance Validation =  0.43627605733167174

Fold  4
Performance Training =  0.6636601219955585
Performance Validation =  0.4037720686570818

Average Performance in Training =  0.5865065525433895
Average Performance in Validation =  0.5289433281993474
----------------------------------------------------

M Value =  7
Lambda Value =  0.64

Fold  1
Performance Training =  0.569209195484049
Performance Validation =  0.617748736906795

Fold  2
Performance Training =  0.5497871792297174
Performance Validation =  0.6550642517611609

Fold  3
Performance Training =  0.5603477167459399
Performance Validation =  0.43458098307631987

Fold  4
```

```
Performance Training =  0.6626689972158313
Performance Validation =  0.4032915166126422


Average Performance in Training =  0.5855032721688844
Average Performance in Validation =  0.5276713720892295
-------------------------------------------------------


M Value =  7
Lambda Value =  0.65


Fold  1
Performance Training =  0.5682275221003054
Performance Validation =  0.6162133823430226


Fold  2
Performance Training =  0.5487576102579119
Performance Validation =  0.6536856397011879


Fold  3
Performance Training =  0.5593518080132807
Performance Validation =  0.43289642170442166


Fold  4
Performance Training =  0.6616787538900473
Performance Validation =  0.40281255492633117


Average Performance in Training =  0.5845039235653864
Average Performance in Validation =  0.5264019996687408
-------------------------------------------------------


M Value =  7
Lambda Value =  0.66


Fold  1
Performance Training =  0.5672517060077554
Performance Validation =  0.6146730105992563


Fold  2
Performance Training =  0.547733422229232
Performance Validation =  0.6523108401287003


Fold  3
Performance Training =  0.5583592403458112
Performance Validation =  0.4312221962176924


Fold  4
Performance Training =  0.6606894466824569
Performance Validation =  0.4023350933047456


Average Performance in Training =  0.5835084538163139
Average Performance in Validation =  0.5251352850625987
-------------------------------------------------------


M Value =  7
Lambda Value =  0.67
```

```
Fold  1
Performance Training =  0.5662816177628608
Performance Validation =  0.6131281047489336

Fold  2
Performance Training =  0.5467145391463322
Performance Validation =  0.6509399087832208

Fold  3
Performance Training =  0.5573699715547007
Performance Validation =  0.429558137767322

Fold  4
Performance Training =  0.6597011300725295
Performance Validation =  0.4018590497069394

Average Performance in Training =  0.5825168146341058
Average Performance in Validation =  0.523871300251604
------------------------------------------------------

M Value =  7
Lambda Value =  0.68

Fold  1
Performance Training =  0.5653171360316246
Performance Validation =  0.6115791254924843

Fold  2
Performance Training =  0.5457008898266418
Performance Validation =  0.649572900049027

Fold  3
Performance Training =  0.5563839636714788
Performance Validation =  0.427904085092227

Fold  4
Performance Training =  0.6587138582187075
Performance Validation =  0.40138434966562875

Average Performance in Training =  0.5815289619371131
Average Performance in Validation =  0.5226101150748417
------------------------------------------------------

M Value =  7
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.5643581469609502
Performance Validation =  0.6100265124028647

Fold  2
Performance Training =  0.5446924074907866
Performance Validation =  0.6482098668725955

Fold  3
Performance Training =  0.5554011825656431
```

```
Performance Validation =  0.42625988400222714


Fold  4
Performance Training =  0.6577276848383982
Performance Validation =  0.40091092566600817


Average Performance in Training =  0.5805448554639445
Average Performance in Validation =  0.5213517972359238
------------------------------------------------------

M Value =  7
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.5634045436025223
Performance Validation =  0.6084706850786468

Fold  2
Performance Training =  0.5436890293870267
Performance Validation =  0.646850860694304

Fold  3
Performance Training =  0.5544215975950704
Performance Validation =  0.42462538690214446

Fold  4
Performance Training =  0.6567426631025676
Performance Validation =  0.40043871657686003


Average Performance in Training =  0.5795644584217967
Average Performance in Validation =  0.5200964123129888
------------------------------------------------------

M Value =  7
Lambda Value =  0.71

Fold  1
Performance Training =  0.5624562253844545
Performance Validation =  0.6069120442133944

Fold  2
Performance Training =  0.5426906964483973
Performance Validation =  0.6454959313928403

Fold  3
Performance Training =  0.5534451812863136
Performance Validation =  0.4230004523532096

Fold  4
Performance Training =  0.6557588455434805
Performance Validation =  0.39996766712919174


Average Performance in Training =  0.5785877371656615
Average Performance in Validation =  0.518844023772159
------------------------------------------------------
```

```
M Value =  7
Lambda Value =  0.72

Fold  1
Performance Training =  0.5615130976264042
Performance Validation =  0.6053509725890989

Fold  2
Performance Training =  0.5416973529795699
Performance Validation =  0.6441451272409505

Fold  3
Performance Training =  0.5524719090421246
Performance Validation =  0.42138494466853327

Fold  4
Performance Training =  0.6547762839742648
Performance Validation =  0.3994977274380942

Average Performance in Training =  0.5776146609055909
Average Performance in Validation =  0.5175946929841693
-----------------------------------------------------

M Value =  7
Lambda Value =  0.73

Fold  1
Performance Training =  0.560575071094298
Performance Validation =  0.6037878360005802

Fold  2
Performance Training =  0.5407089463707446
Performance Validation =  0.6427984948712695

Fold  3
Performance Training =  0.5515017588738129
Performance Validation =  0.4197787335396843

Fold  4
Performance Training =  0.6537950294191246
Performance Validation =  0.399028852563971

Average Performance in Training =  0.576645201439495
Average Performance in Validation =  0.5163484792438763
-----------------------------------------------------

M Value =  7
Lambda Value =  0.74

Fold  1
Performance Training =  0.5596420615911628
Performance Validation =  0.6022229841170275

Fold  2
Performance Training =  0.5397254268361362
Performance Validation =  0.6414560792511264
```

```
Fold  3
Performance Training =  0.5505347111562664
Performance Validation =  0.4181816936917261


Fold  4
Performance Training =  0.6528151320531332
Performance Validation =  0.3985610021096352


Average Performance in Training =  0.5756793329091747
Average Performance in Validation =  0.5151054397923788
------------------------------------------------------


M Value =  7
Lambda Value =  0.75


Fold  1
Performance Training =  0.5587139895809137
Performance Validation =  0.6006567512861698


Fold  2
Performance Training =  0.5387467471748653
Performance Validation =  0.6401179236653096


Fold  3
Performance Training =  0.5495707484036699
Performance Validation =  0.41659370456429723


Fold  4
Performance Training =  0.6518366411506472
Performance Validation =  0.3980941398501363


Average Performance in Training =  0.574717031577524
Average Performance in Validation =  0.5138656298414782
------------------------------------------------------


M Value =  7
Lambda Value =  0.76


Fold  1
Performance Training =  0.557790779842233
Performance Validation =  0.5990894572860019


Fold  2
Performance Training =  0.5377728625522592
Performance Validation =  0.6387840697058956


Fold  3
Performance Training =  0.5486098550641344
Performance Validation =  0.41501465001654625


Fold  4
Performance Training =  0.6508596050414812
Performance Validation =  0.39762823339246245


Average Performance in Training =  0.573758275625027
```

Average Performance in Validation =  0.5126291026002265
------------------------------------------------------

M Value =  7
Lambda Value =  0.77

Fold  1
Performance Training =  0.5568723611499631
Performance Validation =  0.5975214080285031

Fold  2
Performance Training =  0.5368037302997721
Performance Validation =  0.6374545572683255

Fold  3
Performance Training =  0.54765201733162
Performance Validation =  0.4134444180539475

Fold  4
Performance Training =  0.6498840710740543
Performance Validation =  0.39716325386255114

Average Performance in Training =  0.5728030449638524
Average Performance in Validation =  0.5113959093033318
------------------------------------------------------

M Value =  7
Lambda Value =  0.78

Fold  1
Performance Training =  0.5559586659816556
Performance Validation =  0.595952896219285

Fold  2
Performance Training =  0.5358393097318828
Performance Validation =  0.6361294245529907

Fold  3
Performance Training =  0.5466972229736771
Performance Validation =  0.4118829005751916

Fold  4
Performance Training =  0.6489100855848177
Performance Validation =  0.39669917561727075

Average Performance in Training =  0.5718513210680083
Average Performance in Validation =  0.5101660992411845
------------------------------------------------------

M Value =  7
Lambda Value =  0.79

Fold  1
Performance Training =  0.555049630247157
Performance Validation =  0.5943842019767613

```
Fold  2
Performance Training =  0.5348795619785004
Performance Validation =  0.6348087080716835


Fold  3
Performance Training =  0.5457454611736694
Performance Validation =  0.41032999313751384


Fold  4
Performance Training =  0.6479376938733137
Performance Validation =  0.39623597597925675


Average Performance in Training =  0.5709030868181602
Average Performance in Validation =  0.5089397197913039
------------------------------------------------------

M Value =  7
Lambda Value =  0.8

Fold  1
Performance Training =  0.5541451930392938
Performance Validation =  0.5928155934140515


Fold  2
Performance Training =  0.5339244498315321
Performance Validation =  0.6334924426583084


Fold  3
Performance Training =  0.5447967223862604
Performance Validation =  0.4087855947389697


Fold  4
Performance Training =  0.6469669401823033
Performance Validation =  0.3957736349926856


Average Performance in Training =  0.5699583263598473
Average Performance in Validation =  0.5077168164510039
------------------------------------------------------

M Value =  7
Lambda Value =  0.81

Fold  1
Performance Training =  0.553245296403897
Performance Validation =  0.591247327186519


Fold  2
Performance Training =  0.5329739376043906
Performance Validation =  0.6321806614833274


Fold  3
Performance Training =  0.5438509982050476
Performance Validation =  0.40724960761629236


Fold  4
Performance Training =  0.6459978676824346
```

Performance Validation =  0.3953121351982406

Average Performance in Training =  0.5690170249739425
Average Performance in Validation =  0.5064974328710948
------------------------------------------------------

M Value =  7
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.5523498851275723
Performance Validation =  0.5896796490075821

Fold  2
Performance Training =  0.5320279910033363
Performance Validation =  0.6308733960714586

Fold  3
Performance Training =  0.5429082812413424
Performance Validation =  0.405721937057116

Fold  4
Performance Training =  0.6450305184609907
Performance Validation =  0.3948514614256825

Average Performance in Training =  0.5680791689583105
Average Performance in Validation =  0.5052816108904599
------------------------------------------------------

M Value =  7
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.5514589065417521
Performance Validation =  0.5881127941351726

Fold  2
Performance Training =  0.5310865770096455
Performance Validation =  0.6295706763222055

Fold  3
Performance Training =  0.5419685650131634
Performance Validation =  0.40420249122540686

Fold  4
Performance Training =  0.6440649335142841
Performance Validation =  0.39439160060258216

Average Performance in Training =  0.5671447455197113
Average Performance in Validation =  0.5040693905713417
------------------------------------------------------

M Value =  7
Lambda Value =  0.84

Fold  1

```
Performance Training =  0.5505723103417095
Performance Validation =  0.5865469878310038


Fold  2
Performance Training =  0.5301496637716837
Performance Validation =  0.628272530532817


Fold  3
Performance Training =  0.5410318438436054
Performance Validation =  0.40269118099908585


Fold  4
Performance Training =  0.643101152743319
Performance Validation =  0.39393254157789526


Average Performance in Training =  0.5662137426750794
Average Performance in Validation =  0.5028608102352005
------------------------------------------------------

M Value =  7
Lambda Value =  0.85


Fold  1
Performance Training =  0.5496900484193175
Performance Validation =  0.5849824457946242


Fold  2
Performance Training =  0.5292172205060494
Performance Validation =  0.6269789854233467


Fold  3
Performance Training =  0.5400981127678106
Performance Validation =  0.401187919818891


Fold  4
Performance Training =  0.642139214952374
Performance Validation =  0.3934742749591855


Average Performance in Training =  0.5652861491613879
Average Performance in Validation =  0.5016559064990118
------------------------------------------------------

M Value =  7
Lambda Value =  0.86


Fold  1
Performance Training =  0.54881207470845
Performance Validation =  0.5834193745740319


Fold  2
Performance Training =  0.528289217407026
Performance Validation =  0.6256900661634872


Fold  3
Performance Training =  0.539167367447845
Performance Validation =  0.39969262354762736
```

```
Fold  4
Performance Training =  0.641179157850184
Performance Validation =  0.3930167929623939

Average Performance in Training =  0.5643619543533762
Average Performance in Validation =  0.500454714311885
------------------------------------------------------

M Value =  7
Lambda Value =  0.87

Fold  1
Performance Training =  0.547938345042018
Performance Validation =  0.5818579719544916

Fold  2
Performance Training =  0.5273656255636445
Performance Validation =  0.6244057964009073

Fold  3
Performance Training =  0.5382396040948275
Performance Validation =  0.39820521033899947

Fold  4
Performance Training =  0.6402210180534422
Performance Validation =  0.3925600892731611

Average Performance in Training =  0.563441148188483
Average Performance in Validation =  0.4992572669918899
------------------------------------------------------

M Value =  7
Lambda Value =  0.88

Fold  1
Performance Training =  0.5470688170197111
Performance Validation =  0.580298427327046

Fold  2
Performance Training =  0.5264464168837253
Performance Validation =  0.6231261982908418

Fold  3
Performance Training =  0.5373148193977288
Performance Validation =  0.3967256005152985

Fold  4
Performance Training =  0.6392648310923645
Performance Validation =  0.3921041589187797

Average Performance in Training =  0.5625237210983824
Average Performance in Validation =  0.49806359626299146
------------------------------------------------------

M Value =  7
```

```
Lambda Value =  0.89

Fold  1
Performance Training =  0.5462034498856082
Performance Validation =  0.5787409220380806

Fold  2
Performance Training =  0.5255315640243143
Performance Validation =  0.6218512925267057

Fold  3
Performance Training =  0.5363930104582997
Performance Validation =  0.3952537164533121

Fold  4
Performance Training =  0.6383106314180755
Performance Validation =  0.3916489981499469

Average Performance in Training =  0.5616096639465744
Average Performance in Validation =  0.4968737322920113
-----------------------------------------------------

M Value =  7
Lambda Value =  0.9

Fold  1
Performance Training =  0.5453422044148744
Performance Validation =  0.5771856297211944

Fold  2
Performance Training =  0.524621040327988
Performance Validation =  0.6205810983715332

Fold  3
Performance Training =  0.5354741747316315
Performance Validation =  0.3937894824777941

Fold  4
Performance Training =  0.6373584524116102
Performance Validation =  0.3911946043315486

Average Performance in Training =  0.5606989679715261
Average Performance in Validation =  0.49568770372551757
-----------------------------------------------------

M Value =  7
Lambda Value =  0.91

Fold  1
Performance Training =  0.5444850428088469
Performance Validation =  0.5756327166125279

Fold  2
Performance Training =  0.5237148197645424
Performance Validation =  0.619315633690067
```

```
Fold  3
Performance Training =  0.5345583099718996
Performance Validation =  0.39233282476197484


Fold  4
Performance Training =  0.6364083263943381
Performance Validation =  0.3907409758417717


Average Performance in Training =  0.5597916247349067
Average Performance in Validation =  0.4945055377265854
-----------------------------------------------------

M Value =  7
Lambda Value =  0.92

Fold  1
Performance Training =  0.5436319285978493
Performance Validation =  0.5740823418505916


Fold  2
Performance Training =  0.5228128768776196
Performance Validation =  0.6180549149813301


Fold  3
Performance Training =  0.5336454141828701
Performance Validation =  0.39088367123458034


Fold  4
Performance Training =  0.6354602846396336
Performance Validation =  0.390288111978902


Average Performance in Training =  0.558887626074493
Average Performance in Validation =  0.4933272600113511
-----------------------------------------------------

M Value =  7
Lambda Value =  0.93

Fold  1
Performance Training =  0.5427828265511478
Performance Validation =  0.5725346577615823


Fold  2
Performance Training =  0.5219151867358686
Performance Validation =  0.6167989574115418


Fold  3
Performance Training =  0.532735485572793
Performance Validation =  0.38944195149288985


Fold  4
Performance Training =  0.6345143573856382
Performance Validation =  0.3898360128752191


Average Performance in Training =  0.557986964061362
Average Performance in Validation =  0.4921528948853082
```

```
————————————————————————————————————————————————————

M Value =  7
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.5419377025934964
Performance Validation =  0.5709898101310611

Fold  2
Performance Training =  0.5210217248882705
Performance Validation =  0.6155477748472509

Fold  3
Performance Training =  0.5318285225133246
Performance Validation =  0.3880075967213882

Fold  4
Performance Training =  0.6335705738489694
Performance Validation =  0.3893846794174405

Average Performance in Training =  0.5570896309610152
Average Performance in Validation =  0.4909824652792852
————————————————————————————————————————————————————

M Value =  7
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.5410965237277721
Performance Validation =  0.5694479384628328

Fold  2
Performance Training =  0.5201324673232834
Performance Validation =  0.6143013798885716

Fold  3
Performance Training =  0.5309245235021656
Performance Validation =  0.38658053961562044

Fold  4
Performance Training =  0.6326289622392485
Performance Validation =  0.38893411317322424

Average Performance in Training =  0.5561956191981174
Average Performance in Validation =  0.4898159927850623
————————————————————————————————————————————————————

M Value =  7
Lambda Value =  0.96

Fold  1
Performance Training =  0.5402592579632362
Performance Validation =  0.5679091762257862

Fold  2
```

Performance Training =  0.5192473904315009
Performance Validation =  0.6130597839024224


Fold  3
Performance Training =  0.5300234871291121
Performance Validation =  0.38516071431087473


Fold  4
Performance Training =  0.63168954977433
Performance Validation =  0.38848431632326463


Average Performance in Training =  0.5553049213245448
Average Performance in Validation =  0.48865349769058697
------------------------------------------------------

M Value =  7
Lambda Value =  0.97

Fold  1
Performance Training =  0.5394258742490001
Performance Validation =  0.5663736510893955


Fold  2
Performance Training =  0.5183664709715301
Performance Validation =  0.6118229970556773


Fold  3
Performance Training =  0.5291254120452509
Performance Validation =  0.38374805631534514


Fold  4
Performance Training =  0.6307523626961273
Performance Validation =  0.38803529159856376


Average Performance in Training =  0.5544175299904771
Average Performance in Validation =  0.48749499901474547
------------------------------------------------------

M Value =  7
Lambda Value =  0.98

Fold  1
Performance Training =  0.5385963424123024
Performance Validation =  0.5648414851485417


Fold  2
Performance Training =  0.5174896860388372
Performance Validation =  0.6105910283481566


Fold  3
Performance Training =  0.528230296935049
Performance Validation =  0.3823425024474717


Fold  4
Performance Training =  0.6298174262869379
Performance Validation =  0.38758704222248985

Average Performance in Training =  0.5535334379182816
Average Performance in Validation =  0.48634051454166494
------------------------------------------------------

M Value =  7
Lambda Value =  0.99

Fold  1
Performance Training =  0.5377706331012375
Performance Validation =  0.5633127951382557

Fold  2
Performance Training =  0.5166170130373102
Performance Validation =  0.6093638856453821

Fold  3
Performance Training =  0.5273381404911046
Performance Validation =  0.3809439907771518

Fold  4
Performance Training =  0.628884764886184
Performance Validation =  0.3871395718572682

Average Performance in Training =  0.5526526378789591
Average Performance in Validation =  0.48519006085451444
------------------------------------------------------

M Value =  7
Lambda Value =  1.0

Fold  1
Performance Training =  0.536948717731609
Performance Validation =  0.561787692638956

Fold  2
Performance Training =  0.5157484296533237
Performance Validation =  0.6081415757110402

Fold  3
Performance Training =  0.5264489413913516
Performance Validation =  0.37955246057056924

Fold  4
Performance Training =  0.6279544019074876
Performance Validation =  0.3866928845545661

Average Performance in Training =  0.551775122670943
Average Performance in Validation =  0.48404365336878286
------------------------------------------------------

M Value =  7
Lambda Value =  1.01

Fold  1
Performance Training =  0.5361305684375954

Performance Validation =  0.5602662842726857


Fold  2
Performance Training =  0.5148839138320993
Performance Validation =  0.6069241042390975


Fold  3
Performance Training =  0.5255626982785171
Performance Validation =  0.3781678522383751


Fold  4
Performance Training =  0.6270263598560128
Performance Validation =  0.38624698470988084


Average Performance in Training =  0.5509008851010562
Average Performance in Validation =  0.4829013063650098
------------------------------------------------------


M Value =  7
Lambda Value =  1.02


Fold  1
Performance Training =  0.5353161580259542
Performance Validation =  0.558748671890859


Fold  2
Performance Training =  0.5140234437561787
Performance Validation =  0.6057114758855278


Fold  3
Performance Training =  0.5246794097416567
Performance Validation =  0.37679010728700346


Fold  4
Performance Training =  0.6261006603460084
Performance Validation =  0.3858018770204422


Average Performance in Training =  0.5500299179674495
Average Performance in Validation =  0.48176303302095813
------------------------------------------------------


M Value =  7
Lambda Value =  1.03


Fold  1
Performance Training =  0.5345054599334993
Performance Validation =  0.5572349527539571


Fold  2
Performance Training =  0.5131669978258353
Performance Validation =  0.6045036942996044


Fold  3
Performance Training =  0.5237990742996024
Performance Validation =  0.37541916827291144

```
Fold  4
Performance Training =  0.6251773241184977
Performance Validation =  0.3853575664463712

Average Performance in Training =  0.5491622140443586
Average Performance in Validation =  0.48062884544321105
-------------------------------------------------------

M Value =  7
Lambda Value =  1.04

Fold  1
Performance Training =  0.5336984481876141
Performance Validation =  0.5557252197035973

Fold  2
Performance Training =  0.5123145546412643
Performance Validation =  0.6033007621547284

Fold  3
Performance Training =  0.5229216903861613
Performance Validation =  0.37405497875952054

Fold  4
Performance Training =  0.6242563710590592
Performance Validation =  0.38491405817486224

Average Performance in Training =  0.5482977660685247
Average Performance in Validation =  0.4794987546981771
-------------------------------------------------------

M Value =  7
Lambda Value =  1.05

Fold  1
Performance Training =  0.5328950973695805
Performance Validation =  0.5542195613273788

Fold  2
Performance Training =  0.5114660929864152
Performance Validation =  0.6021026811787643

Fold  3
Performance Training =  0.5220472563369392
Performance Validation =  0.37269748327671437

Fold  4
Performance Training =  0.6233378202156579
Performance Validation =  0.3844713575871601

Average Performance in Training =  0.5474365667271481
Average Performance in Validation =  0.47837277084250435
-------------------------------------------------------

M Value =  7
Lambda Value =  1.06
```

```
Fold  1
Performance Training =  0.5320953825805157
Performance Validation =  0.5527180621168739

Fold  2
Performance Training =  0.5106215918143224
Performance Validation =  0.6009094521838528

Fold  3
Performance Training =  0.5211757703776447
Performance Validation =  0.3713466272826973

Fold  4
Performance Training =  0.6224216898164799
Performance Validation =  0.3840294702281354

Average Performance in Training =  0.5465786086472407
Average Performance in Validation =  0.47725090295288985
----------------------------------------------------

M Value =  7
Lambda Value =  1.07

Fold  1
Performance Training =  0.531299279409734
Performance Validation =  0.5512208026191019

Fold  2
Performance Training =  0.5097810302338212
Performance Validation =  0.5997210750956907

Fold  3
Performance Training =  0.5203072306137619
Performance Validation =  0.3700023571280525

Fold  4
Performance Training =  0.6215079972877372
Performance Validation =  0.3835884017782647

Average Performance in Training =  0.5457238843862636
Average Performance in Validation =  0.4761331591552775
----------------------------------------------------

M Value =  7
Lambda Value =  1.08

Fold  1
Performance Training =  0.5305067639053496
Performance Validation =  0.5497278595818265

Fold  2
Performance Training =  0.5089443874975267
Performance Validation =  0.5985375489822495

Fold  3
```

```
Performance Training =  0.5194416350214821
Performance Validation =  0.3686646200218877


Fold  4
Performance Training =  0.6205967592714077
Performance Validation =  0.3831481580278412


Average Performance in Training =  0.5448723864239415
Average Performance in Validation =  0.47501954665345125
-------------------------------------------------------


M Value =  7
Lambda Value =  1.09


Fold  1
Performance Training =  0.5297178125469695
Performance Validation =  0.5482393060929662


Fold  2
Performance Training =  0.5081116429909809
Performance Validation =  0.5973588720819285


Fold  3
Performance Training =  0.5185789814397843
Performance Validation =  0.3673333639998888


Fold  4
Performance Training =  0.6196879916428821
Performance Validation =  0.3827087448532607


Average Performance in Training =  0.5440241071551541
Average Performance in Validation =  0.47391007175701105
-------------------------------------------------------


M Value =  8
Lambda Value =  0.01


Fold  1
Performance Training =  0.7040534873308166
Performance Validation =  0.5082758567674095


Fold  2
Performance Training =  0.6891436875506148
Performance Validation =  0.7588364195021408


Fold  3
Performance Training =  0.6777731960444051
Performance Validation =  0.6388844561494808


Fold  4
Performance Training =  0.7524266125503476
Performance Validation =  0.5268449098253813


Average Performance in Training =  0.7058492458690461
Average Performance in Validation =  0.6082104105611031
-------------------------------------------------------
```

M Value =  8
Lambda Value =  0.02

Fold  1
Performance Training =  0.6895661771337008
Performance Validation =  0.48553632235292765

Fold  2
Performance Training =  0.6658234445201704
Performance Validation =  0.7529591280777876

Fold  3
Performance Training =  0.6599662719909999
Performance Validation =  0.6114209827466719

Fold  4
Performance Training =  0.7395429354338127
Performance Validation =  0.49940138466129047

Average Performance in Training =  0.6887247072696709
Average Performance in Validation =  0.5873294544596694
------------------------------------------------------

M Value =  8
Lambda Value =  0.03

Fold  1
Performance Training =  0.6812659719314696
Performance Validation =  0.49551003256183157

Fold  2
Performance Training =  0.6537974246557733
Performance Validation =  0.7489588910413023

Fold  3
Performance Training =  0.6509854655205123
Performance Validation =  0.5968728608680081

Fold  4
Performance Training =  0.7331348585737558
Performance Validation =  0.4854015425556537

Average Performance in Training =  0.6797959301703778
Average Performance in Validation =  0.5816858317566989
------------------------------------------------------

M Value =  8
Lambda Value =  0.04

Fold  1
Performance Training =  0.6752520649611813
Performance Validation =  0.5120113746642667

Fold  2
Performance Training =  0.6461867399925492

```
Performance Validation =  0.7461035350964796


Fold  3
Performance Training =  0.6453048474351948
Performance Validation =  0.5872458781770913


Fold  4
Performance Training =  0.7291768927955948
Performance Validation =  0.47645612666045656


Average Performance in Training =  0.67398013629613
Average Performance in Validation =  0.5804542286495735
------------------------------------------------------

M Value =  8
Lambda Value =  0.05


Fold  1
Performance Training =  0.6703740364222666
Performance Validation =  0.5287962401174543


Fold  2
Performance Training =  0.6407275724923565
Performance Validation =  0.7438531094949619


Fold  3
Performance Training =  0.6411962965269584
Performance Validation =  0.5800142272239841


Fold  4
Performance Training =  0.7263879166477176
Performance Validation =  0.47002333591377976


Average Performance in Training =  0.6696714555223248
Average Performance in Validation =  0.5806717281875451
------------------------------------------------------

M Value =  8
Lambda Value =  0.06


Fold  1
Performance Training =  0.6661838071115864
Performance Validation =  0.5441876463005269


Fold  2
Performance Training =  0.6364804412861869
Performance Validation =  0.7419457566446583


Fold  3
Performance Training =  0.6379618253136359
Performance Validation =  0.5741428162497747


Fold  4
Performance Training =  0.7242438393897264
Performance Validation =  0.4650603053266871
```

```
Average Performance in Training =  0.6662174782752839
Average Performance in Validation =  0.5813341311304117
--------------------------------------------------------


M Value =  8
Lambda Value =  0.07

Fold  1
Performance Training =  0.6624689419103966
Performance Validation =  0.5578271549479018

Fold  2
Performance Training =  0.6329890855062754
Performance Validation =  0.7402483920154675

Fold  3
Performance Training =  0.635268552368935
Performance Validation =  0.5691297498194112

Fold  4
Performance Training =  0.7224922675950225
Performance Validation =  0.46105258894232226

Average Performance in Training =  0.6633047118451574
Average Performance in Validation =  0.5820644714312757
--------------------------------------------------------


M Value =  8
Lambda Value =  0.08

Fold  1
Performance Training =  0.659112209740256
Performance Validation =  0.5697705886889319

Fold  2
Performance Training =  0.6300056704579327
Performance Validation =  0.7386883181548782

Fold  3
Performance Training =  0.6329380262185085
Performance Validation =  0.564701397611395

Fold  4
Performance Training =  0.7209970473024416
Performance Validation =  0.457712607084363

Average Performance in Training =  0.6607632384297847
Average Performance in Validation =  0.582718227884892
--------------------------------------------------------


M Value =  8
Lambda Value =  0.09

Fold  1
Performance Training =  0.6560406578665144
Performance Validation =  0.5801958568173574
```

Fold  2
Performance Training =  0.6273836987909572
Performance Validation =  0.7372230379211396

Fold  3
Performance Training =  0.6308657597858974
Performance Validation =  0.5606950065069453

Fold  4
Performance Training =  0.7196782913288151
Performance Validation =  0.45486436423997645

Average Performance in Training =  0.6584921019430461
Average Performance in Validation =  0.5832445663713547
----------------------------------------------------

M Value =  8
Lambda Value =  0.1

Fold  1
Performance Training =  0.6532044628955183
Performance Validation =  0.5893019178166163

Fold  2
Performance Training =  0.6250306097967148
Performance Validation =  0.7358261542787388

Fold  3
Performance Training =  0.6289861521857008
Performance Validation =  0.5570070048217108

Fold  4
Performance Training =  0.7184859743984335
Performance Validation =  0.452392541415509

Average Performance in Training =  0.6564267998190918
Average Performance in Validation =  0.5836319045831437
----------------------------------------------------

M Value =  8
Lambda Value =  0.11

Fold  1
Performance Training =  0.6505671494378615
Performance Validation =  0.5972742514124398

Fold  2
Performance Training =  0.6228846771525727
Performance Validation =  0.7344803620459786

Fold  3
Performance Training =  0.6272556061976853
Performance Validation =  0.5535678230452297

Fold  4

```
Performance Training =  0.7173870986178232
Performance Validation =  0.45021747054755457

Average Performance in Training =  0.6545236328514856
Average Performance in Validation =  0.5838849767628007
----------------------------------------------------

M Value =  8
Lambda Value =  0.12

Fold  1
Performance Training =  0.6481006328639511
Performance Validation =  0.6042748570131447

Fold  2
Performance Training =  0.6209028617142565
Performance Validation =  0.7331737629581098

Fold  3
Performance Training =  0.625643748209079
Performance Validation =  0.5503286245009509

Fold  4
Performance Training =  0.7163589540478204
Performance Validation =  0.4482817610207047

Average Performance in Training =  0.6527515492087768
Average Performance in Validation =  0.5840147513732276
----------------------------------------------------

M Value =  8
Lambda Value =  0.13

Fold  1
Performance Training =  0.6457824944536135
Performance Validation =  0.6104413803274295

Fold  2
Performance Training =  0.6190540174286134
Performance Validation =  0.7318978293503486

Fold  3
Performance Training =  0.6241285651815114
Performance Validation =  0.5472538525466347

Fold  4
Performance Training =  0.715385352169609
Performance Validation =  0.4465426568976395

Average Performance in Training =  0.6510876073083368
Average Performance in Validation =  0.584033929780513
----------------------------------------------------

M Value =  8
Lambda Value =  0.14
```

```
Fold  1
Performance Training =  0.6435943697987003
Performance Validation =  0.6158894236466723

Fold  2
Performance Training =  0.6173148898341241
Performance Validation =  0.73064622784928

Fold  3
Performance Training =  0.6226935653934592
Performance Validation =  0.5443168174967212

Fold  4
Performance Training =  0.7144544092412299
Performance Validation =  0.444967421202936

Average Performance in Training =  0.6495143085668784
Average Performance in Validation =  0.5839549725489024
------------------------------------------------------

M Value =  8
Lambda Value =  0.15

Fold  1
Performance Training =  0.6415209309423443
Performance Validation =  0.620715701674154

Fold  2
Performance Training =  0.6156676529957321
Performance Validation =  0.7294141119449039

Fold  3
Performance Training =  0.6213260441891042
Performance Validation =  0.5414969638906202

Fold  4
Performance Training =  0.7135571834865665
Performance Validation =  0.4435304164448446

Average Performance in Training =  0.6480179529034368
Average Performance in Validation =  0.5837892984886306
------------------------------------------------------

M Value =  8
Lambda Value =  0.16

Fold  1
Performance Training =  0.6395492053831442
Performance Validation =  0.6250011454580522

Fold  2
Performance Training =  0.6140983341964193
Performance Validation =  0.7281976804191781

Fold  3
Performance Training =  0.6200159821047806
```

Performance Validation = 0.5387781118826342

Fold 4
Performance Training = 0.7126868051023945
Performance Validation = 0.4422111841665517

Average Performance in Training = 0.6465875816966846
Average Performance in Validation = 0.5835470304816041
------------------------------------------------------

M Value = 8
Lambda Value = 0.17

Fold 1
Performance Training = 0.6376680974890179
Performance Validation = 0.6288136458930397

Fold 2
Performance Training = 0.6125957719002888
Performance Validation = 0.7269938919412986

Fold 3
Performance Training = 0.6187553199441505
Performance Validation = 0.5361472869310167

Fold 4
Performance Training = 0.7118379023405828
Performance Validation = 0.44099313848822563

Average Performance in Training = 0.64521427291851
Average Performance in Validation = 0.5832369908133952
------------------------------------------------------

M Value = 8
Lambda Value = 0.18

Fold 1
Performance Training = 0.6358680381278452
Performance Validation = 0.6322103677930373

Fold 2
Performance Training = 0.6111509055483548
Performance Validation = 0.725800274421672

Fold 3
Performance Training = 0.6175374667564777
Performance Validation = 0.5335939176881326

Fold 4
Performance Training = 0.7110062117903471
Performance Validation = 0.4398626511547822

Average Performance in Training = 0.6438906555557562
Average Performance in Validation = 0.5828668027644061
------------------------------------------------------

```
M Value =  8
Lambda Value =  0.19

Fold  1
Performance Training =  0.6341407194922531
Performance Validation =  0.6352396581644342

Fold  2
Performance Training =  0.6097562784132751
Performance Validation =  0.7246147936292189

Fold  3
Performance Training =  0.6163569564014537
Performance Validation =  0.5311092717085957

Fold  4
Performance Training =  0.7101883068457826
Performance Validation =  0.43880839437612895

Average Performance in Training =  0.6426105652881912
Average Performance in Validation =  0.5824430294695944
----------------------------------------------------

M Value =  8
Lambda Value =  0.2

Fold  1
Performance Training =  0.6324788889752814
Performance Validation =  0.6379426028304787

Fold  2
Performance Training =  0.6084056811519363
Performance Validation =  0.7234357599476491

Fold  3
Performance Training =  0.6152092016868905
Performance Validation =  0.5286860491262886

Fold  4
Performance Training =  0.7093814041138418
Performance Validation =  0.437820858277569

Average Performance in Training =  0.6413687939819874
Average Performance in Validation =  0.5819713175454964
----------------------------------------------------

M Value =  8
Lambda Value =  0.21

Fold  1
Performance Training =  0.6308761854984428
Performance Validation =  0.6403542904117417

Fold  2
Performance Training =  0.6070938906606991
Performance Validation =  0.7222617603550989
```

```
Fold  3
Performance Training =  0.6140903142847006
Performance Validation =  0.5263180839297334


Fold  4
Performance Training =  0.7085832225056767
Performance Validation =  0.43689198960989173


Average Performance in Training =  0.6401609032373798
Average Performance in Validation =  0.5814565310766164
-----------------------------------------------------


M Value =  8
Lambda Value =  0.22


Fold  1
Performance Training =  0.6293270073181332
Performance Validation =  0.6425048376858647


Fold  2
Performance Training =  0.6058164749915502
Performance Validation =  0.7210916075281029


Fold  3
Performance Training =  0.6129969700684801
Performance Validation =  0.5240001202049078


Fold  4
Performance Training =  0.7077918787419551
Performance Validation =  0.4360149165597259


Average Performance in Training =  0.6389830827800297
Average Performance in Validation =  0.5809028704946504
-----------------------------------------------------


M Value =  8
Lambda Value =  0.23


Fold  1
Performance Training =  0.6278264037834645
Performance Validation =  0.6444202223569694


Fold  2
Performance Training =  0.604569645034059
Performance Validation =  0.7199243008677585


Fold  3
Performance Training =  0.6119263065147112
Performance Validation =  0.5217276416925567


Fold  4
Performance Training =  0.7070058085422828
Performance Validation =  0.4351837359188492


Average Performance in Training =  0.6378320409686293
```

Average Performance in Validation =  0.5803139752090335
-------------------------------------------------------

M Value =  8
Lambda Value =  0.24

Fold  1
Performance Training =  0.6263699857115773
Performance Validation =  0.6461229610925604

Fold  2
Performance Training =  0.6033501399478152
Performance Validation =  0.7187589960288822

Fold  3
Performance Training =  0.6108758432015784
Performance Validation =  0.5194967399746544

Fold  4
Performance Training =  0.706223706268855
Performance Validation =  0.43439334622698067

Average Performance in Training =  0.6367049187824565
Average Performance in Validation =  0.5796930108307694
-------------------------------------------------------

M Value =  8
Lambda Value =  0.25

Fold  1
Performance Training =  0.6249538504911691
Performance Validation =  0.6476326633941858

Fold  2
Performance Training =  0.6021551373864751
Performance Validation =  0.7175949806543013

Fold  3
Performance Training =  0.6098434192601647
Performance Validation =  0.5173040111293683

Fold  4
Performance Training =  0.7054444780562038
Performance Validation =  0.4336393153537931

Average Performance in Training =  0.6355992212985032
Average Performance in Validation =  0.5790427426329121
-------------------------------------------------------

M Value =  8
Lambda Value =  0.26

Fold  1
Performance Training =  0.6235745190079438
Performance Validation =  0.6489664857455155

```
Fold  2
Performance Training =  0.6009821822304
Performance Validation =  0.7164316547364258


Fold  3
Performance Training =  0.6088271434835894
Performance Validation =  0.5151464736949415


Fold  4
Performance Training =  0.7046672049509796
Performance Validation =  0.43291777425443223


Average Performance in Training =  0.6345127624182282
Average Performance in Validation =  0.5783655971078288
------------------------------------------------------

M Value =  8
Lambda Value =  0.27

Fold  1
Performance Training =  0.6222288821743394
Performance Validation =  0.6501395054985826


Fold  2
Performance Training =  0.5998291293446913
Performance Validation =  0.715268514499739


Fold  3
Performance Training =  0.6078253540383668
Performance Validation =  0.5130215028118992


Fold  4
Performance Training =  0.7038911135888417
Performance Validation =  0.43222533087804516


Average Performance in Training =  0.6334436197865598
Average Performance in Validation =  0.5776637134220665
------------------------------------------------------

M Value =  8
Lambda Value =  0.28

Fold  1
Performance Training =  0.6209141553412068
Performance Validation =  0.6511650299708004


Fold  2
Performance Training =  0.5986940971119386
Performance Validation =  0.7141051390126416


Fold  3
Performance Training =  0.6068365855667844
Performance Validation =  0.5109267768096072


Fold  4
Performance Training =  0.703115552621872
```

Performance Validation =  0.43155899977878376

Average Performance in Training =  0.6323900976604504
Average Performance in Validation =  0.5769389863929583
------------------------------------------------------

M Value =  8
Lambda Value =  0.29

Fold  1
Performance Training =  0.6196278392336463
Performance Validation =  0.6520548530619712

Fold  2
Performance Training =  0.5975754293473384
Performance Validation =  0.7129411789511316

Fold  3
Performance Training =  0.6058595420549238
Performance Validation =  0.5088602334803956

Fold  4
Performance Training =  0.7023399735872161
Performance Validation =  0.43091614409443635

Average Performance in Training =  0.6313506960557811
Average Performance in Validation =  0.5761931023969837
------------------------------------------------------

M Value =  8
Lambda Value =  0.3

Fold  1
Performance Training =  0.6183676863269805
Performance Validation =  0.6528194692021169

Fold  2
Performance Training =  0.596471663810989
Performance Validation =  0.7117763470851018

Fold  3
Performance Training =  0.6048930742539453
Performance Validation =  0.5068200339787763

Fold  4
Performance Training =  0.7015639152445801
Performance Validation =  0.43029442736276224

Average Performance in Training =  0.6303240849091237
Average Performance in Validation =  0.5754275694071893
------------------------------------------------------

M Value =  8
Lambda Value =  0.31

Fold  1

```
Performance Training =  0.6171316717880491
Performance Validation =  0.6534682524704294


Fold  2
Performance Training =  0.595381505967953
Performance Validation =  0.7106104101625359


Fold  3
Performance Training =  0.6039361607379081
Performance Validation =  0.5048045327836179


Fold  4
Performance Training =  0.7007869906514804
Performance Validation =  0.4296917732341481


Average Performance in Training =  0.6293090822863476
Average Performance in Validation =  0.5746437421626829
------------------------------------------------------

M Value =  8
Lambda Value =  0.32

Fold  1
Performance Training =  0.6159179682693081
Performance Validation =  0.6540096071709803


Fold  2
Performance Training =  0.5943038069638114
Performance Validation =  0.7094431819418756


Fold  3
Performance Training =  0.6029878918960645
Performance Validation =  0.5028122525264862


Fold  4
Performance Training =  0.7000088764201357
Performance Validation =  0.42910633157524647


Average Performance in Training =  0.6283046358873299
Average Performance in Validation =  0.5738428433036472
------------------------------------------------------

M Value =  8
Lambda Value =  0.33

Fold  1
Performance Training =  0.6147249239707595
Performance Validation =  0.6544510949221294


Fold  2
Performance Training =  0.5932375450171608
Performance Validation =  0.7082745171775042


Fold  3
Performance Training =  0.6020474563155882
Performance Validation =  0.5008418627596116
```

```
Fold  4
Performance Training =  0.6992293037284387
Performance Validation =  0.42853644978496885

Average Performance in Training =  0.6273098072579868
Average Performance in Validation =  0.5730259811610535
----------------------------------------------------

M Value =  8
Lambda Value =  0.34

Fold  1
Performance Training =  0.6135510434860898
Performance Validation =  0.6547995423431772

Fold  2
Performance Training =  0.5921818096048747
Performance Validation =  0.707104306403825

Fold  3
Performance Training =  0.6011141291284661
Performance Validation =  0.4988921619388559

Fold  4
Performance Training =  0.6984480507529509
Performance Validation =  0.42798064839172767

Average Performance in Training =  0.6263237582430954
Average Performance in Validation =  0.5721941647693964
----------------------------------------------------

M Value =  8
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.6123949710307477
Performance Validation =  0.6550611326484819

Fold  2
Performance Training =  0.5911357879474946
Performance Validation =  0.7059324713939454

Fold  3
Performance Training =  0.6001872619851292
Performance Validation =  0.49696206204990934

Fold  4
Performance Training =  0.6976649362635878
Performance Validation =  0.4274376001902591

Average Performance in Training =  0.6253457393067399
Average Performance in Validation =  0.571348316570649
----------------------------------------------------

M Value =  8
```

Lambda Value =  0.36

Fold  1
Performance Training =  0.6112554757154803
Performance Validation =  0.6552414838425864

Fold  2
Performance Training =  0.5900987534024418
Performance Validation =  0.7047589611922804

Fold  3
Performance Training =  0.5992662743851875
Performance Validation =  0.495050575422576

Fold  4
Performance Training =  0.696879814174103
Performance Validation =  0.4269061123226936

Average Performance in Training =  0.6243750794193033
Average Performance in Validation =  0.5704892831950341
------------------------------------------------------

M Value =  8
Lambda Value =  0.37

Fold  1
Performance Training =  0.6101314385825345
Performance Validation =  0.6553457157167654

Fold  2
Performance Training =  0.5890700554499806
Performance Validation =  0.7035837486384667

Fold  3
Performance Training =  0.598350646147881
Performance Validation =  0.49315680336796686

Fold  4
Performance Training =  0.6960925688841768
Performance Validation =  0.42638511082254327

Average Performance in Training =  0.6234111772661433
Average Performance in Validation =  0.5696178446364356
------------------------------------------------------

M Value =  8
Lambda Value =  0.38

Fold  1
Performance Training =  0.60902184116575
Performance Validation =  0.6553785074513253

Fold  2
Performance Training =  0.5880491110169324
Performance Validation =  0.7024068273141537

```
Fold  3
Performance Training =  0.5974399108455497
Performance Validation =  0.4912799263434101


Fold  4
Performance Training =  0.6953031112811559
Performance Validation =  0.4258736272298882


Average Performance in Training =  0.6224534935773469
Average Performance in Validation =  0.5687347220846943
-----------------------------------------------------

M Value =  8
Lambda Value =  0.39

Fold  1
Performance Training =  0.6079257553721262
Performance Validation =  0.6553441473088277


Fold  2
Performance Training =  0.5870353969302426
Performance Validation =  0.7012282088555174


Fold  3
Performance Training =  0.5965336500554073
Performance Validation =  0.48941919540475787


Fold  4
Performance Training =  0.6945113752946322
Performance Validation =  0.425370786956932


Average Performance in Training =  0.6215015444131021
Average Performance in Validation =  0.5678405846315088
-----------------------------------------------------

M Value =  8
Lambda Value =  0.4

Fold  1
Performance Training =  0.6068423345126112
Performance Validation =  0.6552465756452427


Fold  2
Performance Training =  0.5860284433297371
Performance Validation =  0.7000479205833737


Fold  3
Performance Training =  0.5956314883102577
Performance Validation =  0.4875739247492108


Fold  4
Performance Training =  0.6937173149168101
Performance Validation =  0.42487579913965023


Average Performance in Training =  0.6205548952673541
Average Performance in Validation =  0.5669360550293694
```

```
-------------------------------------------------------

M Value =  8
Lambda Value =  0.41000000000000003

Fold  1
Performance Training =  0.6057708053350122
Performance Validation =  0.6550894222564132

Fold  2
Performance Training =  0.5850278278991072
Performance Validation =  0.6988660034101455

Fold  3
Performance Training =  0.5947330886490583
Performance Validation =  0.48574348518630606

Fold  4
Performance Training =  0.6929209016172552
Performance Validation =  0.42438794775664923

Average Performance in Training =  0.6196131558751082
Average Performance in Validation =  0.5660217146523785
-------------------------------------------------------

M Value =  8
Lambda Value =  0.42

Fold  1
Performance Training =  0.6047104609329975
Performance Validation =  0.6548760389064094

Fold  2
Performance Training =  0.5840331707979785
Performance Validation =  0.6976825099889301

Fold  3
Performance Training =  0.5938381486845565
Performance Validation =  0.4839272984025038

Fold  4
Performance Training =  0.692122122093115
Performance Validation =  0.4239065838329684

Average Performance in Training =  0.6186759756271619
Average Performance in Validation =  0.565098107782703
-------------------------------------------------------

M Value =  8
Lambda Value =  0.43

Fold  1
Performance Training =  0.6036606544228749
Performance Validation =  0.6546095277446403

Fold  2
```

```
Performance Training =  0.5830441301971867
Performance Validation =  0.6964975030749102


Fold  3
Performance Training =  0.5929463971184803
Performance Validation =  0.4821248319071594


Fold  4
Performance Training =  0.6913209763059238
Performance Validation =  0.4234311185763897


Average Performance in Training =  0.6177430395111164
Average Performance in Validation =  0.5641657453257749
------------------------------------------------------

M Value =  8
Lambda Value =  0.44

Fold  1
Performance Training =  0.6026207932947774
Performance Validation =  0.6542927662039126


Fold  2
Performance Training =  0.5820603983350576
Performance Validation =  0.6953110540734762


Fold  3
Performance Training =  0.5920575906455676
Performance Validation =  0.4803355945658304


Fold  4
Performance Training =  0.6905174757642063
Performance Validation =  0.4229610173181081


Average Performance in Training =  0.6168140645099023
Average Performance in Validation =  0.5632251080403319
------------------------------------------------------

M Value =  8
Lambda Value =  0.45

Fold  1
Performance Training =  0.6015903343575717
Performance Validation =  0.6539284288772276


Fold  2
Performance Training =  0.5810816980253084
Performance Validation =  0.6941232417529124


Fold  3
Performance Training =  0.5911715111966273
Performance Validation =  0.47855913264182004


Fold  4
Performance Training =  0.6897116420176999
Performance Validation =  0.4224957941496248
```

```
Average Performance in Training =  0.6158887963993018
Average Performance in Validation =  0.5622766493553962
------------------------------------------------------

M Value =  8
Lambda Value =  0.46

Fold  1
Performance Training =  0.6005687792075487
Performance Validation =  0.6535190067930072

Fold  2
Performance Training =  0.5801077795577557
Performance Validation =  0.6929341511024233

Fold  3
Performance Training =  0.5902879634781608
Performance Validation =  0.4767950262789665

Fold  4
Performance Training =  0.6889035053343937
Performance Validation =  0.42203500716421394

Average Performance in Training =  0.6149670068944647
Average Performance in Validation =  0.5613207978346527
------------------------------------------------------

M Value =  8
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.5995556701601445
Performance Validation =  0.6530668244437599

Fold  2
Performance Training =  0.5791384179417483
Performance Validation =  0.691743872318761

Fold  3
Performance Training =  0.5894067727722061
Performance Validation =  0.47504288636885705

Fold  4
Performance Training =  0.688093103536028
Performance Validation =  0.42157825422498196

Average Performance in Training =  0.6140484911025317
Average Performance in Validation =  0.5603579593390899
------------------------------------------------------

M Value =  8
Lambda Value =  0.48

Fold  1
Performance Training =  0.5985505865917873
```

Performance Validation =  0.6525740548693539

Fold  2
Performance Training =  0.5781734104495158
Performance Validation =  0.6905524999068333

Fold  3
Performance Training =  0.5885277829651496
Performance Validation =  0.47330235175396707

Fold  4
Performance Training =  0.6872804809713581
Performance Validation =  0.42112516919295484

Average Performance in Training =  0.6131330652444527
Average Performance in Validation =  0.5593885189307772
----------------------------------------------------

M Value =  8
Lambda Value =  0.49

Fold  1
Performance Training =  0.5975531416456843
Performance Validation =  0.6520427330511385

Fold  2
Performance Training =  0.5772125744227052
Performance Validation =  0.6893601318814937

Fold  3
Performance Training =  0.5876508547785726
Performance Validation =  0.4715730867252451

Fold  4
Performance Training =  0.686465687609533
Performance Validation =  0.4206754185581346

Average Performance in Training =  0.6122205646141238
Average Performance in Validation =  0.5584128425540029
----------------------------------------------------

M Value =  8
Lambda Value =  0.5

Fold  1
Performance Training =  0.5965629792611544
Performance Validation =  0.6514747678355393

Fold  2
Performance Training =  0.5762557453104716
Performance Validation =  0.6881668690592664

Fold  3
Performance Training =  0.5867758641787912
Performance Validation =  0.4698547787784746

Fold  4
Performance Training =  0.6856487782384818
Performance Validation =  0.4202286984244975

Average Performance in Training =  0.6113108417472248
Average Performance in Validation =  0.5574312785244444
------------------------------------------------------

M Value =  8
Lambda Value =  0.51

Fold  1
Performance Training =  0.59557977149109
Performance Validation =  0.6508719525742097

Fold  2
Performance Training =  0.5753027749118007
Performance Validation =  0.6869728144301097

Fold  3
Performance Training =  0.585902700944833
Performance Validation =  0.46814713659869467

Fold  4
Performance Training =  0.6848298117553332
Performance Validation =  0.41978473180662657

Average Performance in Training =  0.6104037647757642
Average Performance in Validation =  0.5564441588524102
------------------------------------------------------

M Value =  8
Lambda Value =  0.52

Fold  1
Performance Training =  0.5946032160764407
Performance Validation =  0.6502359746411914

Fold  2
Performance Training =  0.5743535297983791
Performance Validation =  0.6857780726005016

Fold  3
Performance Training =  0.5850312673772057
Performance Validation =  0.4664498882461192

Fold  4
Performance Training =  0.6840088505376755
Performance Validation =  0.41934326620141593

Average Performance in Training =  0.6094992159474252
Average Performance in Validation =  0.555451800422307
------------------------------------------------------

M Value =  8
Lambda Value =  0.53

```
Fold  1
Performance Training =  0.5936330342503432
Performance Validation =  0.6495684239651616

Fold  2
Performance Training =  0.5734078898974223
Performance Validation =  0.6845827493001225

Fold  3
Performance Training =  0.5841614771320234
Performance Validation =  0.4647627795204775

Fold  4
Performance Training =  0.6831859598859986
Performance Validation =  0.41890407140309827

Average Performance in Training =  0.6085970902914468
Average Performance in Validation =  0.554454506047215
---------------------------------------------------

M Value =  8
Lambda Value =  0.54

Fold  1
Performance Training =  0.592668968747748
Performance Validation =  0.6488708006957508

Fold  2
Performance Training =  0.5724657472165213
Performance Validation =  0.6833869509453181

Fold  3
Performance Training =  0.5832932541669931
Performance Validation =  0.46308557248375415

Fold  4
Performance Training =  0.6823612075289247
Performance Validation =  0.4184669375340103

Average Performance in Training =  0.6076972944150467
Average Performance in Validation =  0.5534525654147083
---------------------------------------------------

M Value =  8
Lambda Value =  0.55

Fold  1
Performance Training =  0.5917107819992208
Performance Validation =  0.6481445221068538

Fold  2
Performance Training =  0.5715270046948142
Performance Validation =  0.6821907842532839

Fold  3
```

```
Performance Training =  0.5824265317873818
Performance Validation =  0.4614180441237963


Fold  4
Performance Training =  0.6815346631839416
Performance Validation =  0.41803167326701396


Average Performance in Training =  0.6067997454163396
Average Performance in Validation =  0.552446255937737
-------------------------------------------------------


M Value =  8
Lambda Value =  0.56


Fold  1
Performance Training =  0.5907582544900405
Performance Validation =  0.6473909288260797


Fold  2
Performance Training =  0.5705915751667445
Performance Validation =  0.6809943559015962


Fold  3
Performance Training =  0.5815612517815247
Performance Validation =  0.4597599851435358


Fold  4
Performance Training =  0.6807063981672836
Performance Validation =  0.41759810421853505


Average Performance in Training =  0.6059043699013984
Average Performance in Validation =  0.5514358435224367
-------------------------------------------------------


M Value =  8
Lambda Value =  0.5700000000000001


Fold  1
Performance Training =  0.5898111832678635
Performance Validation =  0.6466112904677921


Fold  2
Performance Training =  0.5696593804263278
Performance Validation =  0.6797977722283082


Fold  3
Performance Training =  0.5806973636366425
Performance Validation =  0.4581111988623523


Fold  4
Performance Training =  0.679876485047402
Performance Validation =  0.4171660714937794


Average Performance in Training =  0.605011103094559
Average Performance in Validation =  0.550421583263058
-------------------------------------------------------
```

```
M Value =  8
Lambda Value =  0.58

Fold  1
Performance Training =  0.5888693805840952
Performance Validation =  0.6458068107371293

Fold  2
Performance Training =  0.5687303503813053
Performance Validation =  0.6786011389683516

Fold  3
Performance Training =  0.5798348238268174
Performance Validation =  0.456471500217843

Fold  4
Performance Training =  0.6790449973371606
Performance Validation =  0.4167354303679205

Average Performance in Training =  0.6041198880323446
Average Performance in Validation =  0.549403720072811
------------------------------------------------------

M Value =  8
Lambda Value =  0.59

Fold  1
Performance Training =  0.5879326726557568
Performance Validation =  0.6449786320638413

Fold  2
Performance Training =  0.5678044222877973
Performance Validation =  0.6774045610224452

Fold  3
Performance Training =  0.578973595165891
Performance Validation =  0.4548407148575274

Fold  4
Performance Training =  0.6782120092204835
Performance Validation =  0.4163060490890046

Average Performance in Training =  0.6032306748324822
Average Performance in Validation =  0.5483824892582045
------------------------------------------------------

M Value =  8
Lambda Value =  0.6

Fold  1
Performance Training =  0.5870008985360771
Performance Validation =  0.6441278398173511

Fold  2
Performance Training =  0.5668815400571765
```

```
Performance Validation =  0.676208142255125


Fold  3
Performance Training =  0.5781136462188661
Performance Validation =  0.4532186783113974


Fold  4
Performance Training =  0.6773775953096897
Performance Validation =  0.41587780778998507


Average Performance in Training =  0.6023434200304523
Average Performance in Validation =  0.5473581170434647
----------------------------------------------------


M Value =  8
Lambda Value =  0.61


Fold  1
Performance Training =  0.5860739090833106
Performance Validation =  0.6432554661481067


Fold  2
Performance Training =  0.5659616536278067
Performance Validation =  0.6750119853188576


Fold  3
Performance Training =  0.5772549507660971
Performance Validation =  0.4516052352371257


Fold  4
Performance Training =  0.6765418304302067
Performance Validation =  0.41545059749877267


Average Performance in Training =  0.6014580859768552
Average Performance in Validation =  0.5463308210507156
----------------------------------------------------


M Value =  8
Lambda Value =  0.62


Fold  1
Performance Training =  0.585151566018397
Performance Validation =  0.6423624934947756


Fold  2
Performance Training =  0.5650447183951373
Performance Validation =  0.6738161915015356


Fold  3
Performance Training =  0.5763974873151725
Performance Validation =  0.45000023873075534


Fold  4
Performance Training =  0.6757047894297257
Performance Validation =  0.41502431923644656
```

```
Average Performance in Training =  0.6005746402896082
Average Performance in Validation =  0.5453008107408782
------------------------------------------------------

M Value =  8
Lambda Value =  0.63

Fold  1
Performance Training =  0.5842337410630785
Performance Validation =  0.6414498577920966

Fold  2
Performance Training =  0.56413069469435
Performance Validation =  0.6726208605949193

Fold  3
Performance Training =  0.575541238655942
Performance Validation =  0.44840354969647467

Fold  4
Performance Training =  0.67486654700921
Performance Validation =  0.41459888319488025

Average Performance in Training =  0.5996930553556451
Average Performance in Validation =  0.5442682878195927
------------------------------------------------------

M Value =  8
Lambda Value =  0.64

Fold  1
Performance Training =  0.5833203151509472
Performance Validation =  0.6405184514100484

Fold  2
Performance Training =  0.5632195473304065
Performance Validation =  0.6714260907818594

Fold  3
Performance Training =  0.5746861914546233
Performance Validation =  0.4468150362697889

Fold  4
Performance Training =  0.6740271775734585
Performance Validation =  0.4141742079860238

Average Performance in Training =  0.5988133078773589
Average Performance in Validation =  0.5432334466119302
------------------------------------------------------

M Value =  8
Lambda Value =  0.65

Fold  1
Performance Training =  0.5824111777046852
Performance Validation =  0.6395691258514508
```

```
Fold  2
Performance Training =  0.5623112451508792
Performance Validation =  0.6702319785403379

Fold  3
Performance Training =  0.5738323358833327
Performance Validation =  0.4452345732889781

Fold  4
Performance Training =  0.6731867550991779
Performance Validation =  0.413750219955904

Average Performance in Training =  0.5979353784595187
Average Performance in Validation =  0.5421964744091677
----------------------------------------------------

M Value =  8
Lambda Value =  0.66

Fold  1
Performance Training =  0.5815062259734384
Performance Validation =  0.6386026942319611

Fold  2
Performance Training =  0.5614057606574626
Performance Validation =  0.6690386185625821

Fold  3
Performance Training =  0.5729796652817825
Performance Validation =  0.44366204181035895

Fold  4
Performance Training =  0.6723453530187513
Performance Validation =  0.41332685255718693

Average Performance in Training =  0.5970592512328587
Average Performance in Validation =  0.5411575517905223
----------------------------------------------------

M Value =  8
Lambda Value =  0.67

Fold  1
Performance Training =  0.5806053644248712
Performance Validation =  0.6376199335637256

Fold  2
Performance Training =  0.5605030696524778
Performance Validation =  0.66784610368768

Fold  3
Performance Training =  0.5721281758481955
Performance Validation =  0.4420973286632346

Fold  4
```

```
Performance Training =  0.6715030441180869
Performance Validation =  0.4129040457747696


Average Performance in Training =  0.5961849135109079
Average Performance in Validation =  0.5401168529223525
----------------------------------------------------


M Value =  8
Lambda Value =  0.68


Fold  1
Performance Training =  0.5797085041870028
Performance Validation =  0.6366215868615439


Fold  2
Performance Training =  0.5596031509170709
Performance Validation =  0.6666545248462799


Fold  3
Performance Training =  0.5712778663567988
Performance Validation =  0.4405403260409455


Fold  4
Performance Training =  0.670659900447097
Performance Validation =  0.4124817455994737


Average Performance in Training =  0.5953123554769923
Average Performance in Validation =  0.5390745458370607
----------------------------------------------------


M Value =  8
Lambda Value =  0.6900000000000001


Fold  1
Performance Training =  0.5788155625353977
Performance Validation =  0.6356083650883644


Fold  2
Performance Training =  0.5587059859181465
Performance Validation =  0.6654639710160968


Fold  3
Performance Training =  0.5704287378995111
Performance Validation =  0.43899093112472176


Fold  4
Performance Training =  0.6698159932415243
Performance Validation =  0.4120599035454118


Average Performance in Training =  0.5944415698986449
Average Performance in Validation =  0.5380307926936487
----------------------------------------------------


M Value =  8
Lambda Value =  0.7000000000000001
```

```
Fold  1
Performance Training =  0.5779264624217211
Performance Validation =  0.6345809489550505

Fold  2
Performance Training =  0.5578115585413754
Performance Validation =  0.6642745291870935

Fold  3
Performance Training =  0.5695807936496767
Performance Validation =  0.4374490457374157

Fold  4
Performance Training =  0.6689713928549597
Performance Validation =  0.41163847620705485

Average Performance in Training =  0.5935725518669333
Average Performance in Validation =  0.5369857500216537
-------------------------------------------------------

M Value =  8
Lambda Value =  0.71

Fold  1
Performance Training =  0.5770411320400515
Performance Validation =  0.6335399905877804

Fold  2
Performance Training =  0.556919854847882
Performance Validation =  0.6630862843352945

Fold  3
Performance Training =  0.5687340386459026
Performance Validation =  0.4359145760244899

Fold  4
Performance Training =  0.6681261687000193
Performance Validation =  0.41121742485242996

Average Performance in Training =  0.5927052985584638
Average Performance in Validation =  0.5359395689499986
-------------------------------------------------------

M Value =  8
Lambda Value =  0.72

Fold  1
Performance Training =  0.5761595044276875
Performance Validation =  0.6324861150750278

Fold  2
Performance Training =  0.5560308628524557
Performance Validation =  0.6618993194043057

Fold  3
Performance Training =  0.5678884795942454
```

```
Performance Validation =  0.434387432159833


Fold  4
Performance Training =  0.667280389197753
Performance Validation =  0.41079671504923254


Average Performance in Training =  0.5918398090180355
Average Performance in Validation =  0.5348923954220998
------------------------------------------------------

M Value =  8
Lambda Value =  0.73


Fold  1
Performance Training =  0.5752815170974963
Performance Validation =  0.6314199219048171


Fold  2
Performance Training =  0.5551445723213454
Performance Validation =  0.6607137152937114


Fold  3
Performance Training =  0.5670441246871596
Performance Validation =  0.4328675280743225


Fold  4
Performance Training =  0.6664341217344572
Performance Validation =  0.4103763163209587


Average Performance in Training =  0.5909760839601146
Average Performance in Validation =  0.5338443703984523
------------------------------------------------------

M Value =  8
Lambda Value =  0.74


Fold  1
Performance Training =  0.5744071116991252
Performance Validation =  0.630341986301846


Fold  2
Performance Training =  0.5542609745878735
Performance Validation =  0.6595295508535808


Fold  3
Performance Training =  0.5662009834377594
Performance Validation =  0.4313547812051146


Fold  4
Performance Training =  0.6655874326251415
Performance Validation =  0.4099562018304398


Average Performance in Training =  0.5901141255874749
Average Performance in Validation =  0.5327956300477453
------------------------------------------------------
```

```
M Value =  8
Lambda Value =  0.75

Fold  1
Performance Training =  0.5735362337066445
Performance Validation =  0.6292528604730901

Fold  2
Performance Training =  0.5533800623842935
Performance Validation =  0.6583469028844221

Fold  3
Performance Training =  0.5653590665281003
Performance Validation =  0.4298491122639848

Fold  4
Performance Training =  0.6647403870829796
Performance Validation =  0.4095363480884181

Average Performance in Training =  0.5892539374255045
Average Performance in Validation =  0.5317463059274788
------------------------------------------------------

M Value =  8
Lambda Value =  0.76

Fold  1
Performance Training =  0.5726688321304189
Performance Validation =  0.6281530747696575

Fold  2
Performance Training =  0.5525018296884425
Performance Validation =  0.6571658461419457

Fold  3
Performance Training =  0.5645183856702785
Performance Validation =  0.4283504450230443

Fold  4
Performance Training =  0.6638930491941402
Performance Validation =  0.4091167346850263

Average Performance in Training =  0.58839552417082
Average Performance in Validation =  0.5306965251549184
------------------------------------------------------

M Value =  8
Lambda Value =  0.77

Fold  1
Performance Training =  0.5718048592511971
Performance Validation =  0.6270431387718656

Fold  2
Performance Training =  0.5516262715839035
Performance Validation =  0.6559864533461149
```

Fold  3
Performance Training =  0.5636789534792832
Performance Validation =  0.4268587061164627


Fold  4
Performance Training =  0.6630454818974515
Performance Validation =  0.4086973440422319


Average Performance in Training =  0.5875388915529588
Average Performance in Validation =  0.5296464105691687
------------------------------------------------------


M Value =  8
Lambda Value =  0.78


Fold  1
Performance Training =  0.5709442703745986
Performance Validation =  0.6259235423038629


Fold  2
Performance Training =  0.5507533841324832
Performance Validation =  0.6548087951939524


Fold  3
Performance Training =  0.562840783356608
Performance Validation =  0.42537382485681907


Fold  4
Performance Training =  0.6621977469684113
Performance Validation =  0.40827816118549476


Average Performance in Training =  0.5866840462080253
Average Performance in Validation =  0.5285960808850323
------------------------------------------------------


M Value =  8
Lambda Value =  0.79


Fold  1
Performance Training =  0.5700870236043296
Performance Validation =  0.6247947563834828


Fold  2
Performance Training =  0.5498831642579491
Performance Validation =  0.6536329403756773


Fold  3
Performance Training =  0.5620038893837356
Performance Validation =  0.4238957330649539


Fold  4
Performance Training =  0.6613499050070981
Performance Validation =  0.4078591735330378


Average Performance in Training =  0.5858309955632781

```
Average Performance in Validation =  0.527545650839288
-------------------------------------------------------


M Value =  8
Lambda Value =  0.8

Fold  1
Performance Training =  0.5692330796326185
Performance Validation =  0.6236572341124951

Fold  2
Performance Training =  0.5490156096400451
Performance Validation =  0.6524589555937543

Fold  3
Performance Training =  0.5611682862246742
Performance Validation =  0.42242436491217594

Fold  4
Performance Training =  0.6605020154295802
Performance Validation =  0.40744037070128836

Average Performance in Training =  0.5849797477317296
Average Performance in Validation =  0.5264952313299285
-------------------------------------------------------


M Value =  8
Lambda Value =  0.81

Fold  1
Performance Training =  0.5683824015464836
Performance Validation =  0.622511411511925

Fold  2
Performance Training =  0.5481507186179071
Performance Validation =  0.651286905584489

Fold  3
Performance Training =  0.560333989036811
Performance Validation =  0.42095965677387914

Fold  4
Performance Training =  0.6596541364624695
Performance Validation =  0.40702174432516736

Average Performance in Training =  0.5841303114159178
Average Performance in Validation =  0.5254449295488651
-------------------------------------------------------


M Value =  8
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.567534954648574
Performance Validation =  0.621357708306693
```

```
Fold  2
Performance Training =  0.547288490102074
Performance Validation =  0.6501168531418415


Fold  3
Performance Training =  0.5595010133893888
Performance Validation =  0.41950154709363474


Fold  4
Performance Training =  0.6588063251402836
Performance Validation =  0.4066032878920288


Average Performance in Training =  0.5832826958200801
Average Performance in Validation =  0.5243948491085495
-----------------------------------------------------

M Value =  8
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.5666907062914253
Performance Validation =  0.620196528663414


Fold  2
Performance Training =  0.5464289234943649
Performance Validation =  0.6489488591431617


Fold  3
Performance Training =  0.5586693751890024
Performance Validation =  0.4180499762569717


Fold  4
Performance Training =  0.65795863730533
Performance Validation =  0.4061849965881543


Average Performance in Training =  0.5824369105700307
Average Performance in Validation =  0.5233450901629254
-----------------------------------------------------

M Value =  8
Lambda Value =  0.84

Fold  1
Performance Training =  0.5658496257240826
Performance Validation =  0.6190282618848832


Fold  2
Performance Training =  0.5455720186149513
Performance Validation =  0.6477829825765684


Fold  3
Performance Training =  0.5578390906115327
Performance Validation =  0.4166048864740599


Fold  4
Performance Training =  0.6571111276098351
```

```
Performance Validation =  0.4057668671568042

Average Performance in Training =  0.5815929656401004
Average Performance in Validation =  0.5222957495230789
-------------------------------------------------------

M Value =  8
Lambda Value =  0.85

Fold  1
Performance Training =  0.5650116839501174
Performance Validation =  0.6178532830644307

Fold  2
Performance Training =  0.5447177756360224
Performance Validation =  0.6466192805697442

Fold  3
Performance Training =  0.5570101760400094
Performance Validation =  0.41516622167062034

Fold  4
Performance Training =  0.656263849520085
Performance Validation =  0.40534889776691574

Average Performance in Training =  0.5807508712865586
Average Performance in Validation =  0.5212469207679278
-------------------------------------------------------

M Value =  8
Lambda Value =  0.86

Fold  1
Performance Training =  0.5641768535961582
Performance Validation =  0.616671953703074

Fold  2
Performance Training =  0.5438661950214856
Performance Validation =  0.6454578084199121

Fold  3
Performance Training =  0.5561826480079205
Performance Validation =  0.4137339273864472

Fold  4
Performance Training =  0.6554168553223559
Performance Validation =  0.40493108789161014

Average Performance in Training =  0.5799106379869801
Average Performance in Validation =  0.5201986943502608
-------------------------------------------------------

M Value =  8
Lambda Value =  0.87

Fold  1
```

Performance Training =  0.5633451087901239
Performance Validation =  0.6154846222921175


Fold  2
Performance Training =  0.5430172774721961
Performance Validation =  0.6442986196248086


Fold  3
Performance Training =  0.5553565231475344
Performance Validation =  0.41230795068094106


Fold  4
Performance Training =  0.6545701961304297
Performance Validation =  0.40451343819575303


Average Performance in Training =  0.579072276385071
Average Performance in Validation =  0.519151157698405
------------------------------------------------------

M Value =  8
Lambda Value =  0.88

Fold  1
Performance Training =  0.5625164250484151
Performance Validation =  0.6142916248636561


Fold  2
Performance Training =  0.542171023876256
Performance Validation =  0.6431417659144725


Fold  3
Performance Training =  0.5545318181428376
Performance Validation =  0.4108882400451349


Fold  4
Performance Training =  0.6537239218945257
Performance Validation =  0.4040959504318633


Average Performance in Training =  0.5782357972405086
Average Performance in Validation =  0.5181043953137817
------------------------------------------------------

M Value =  8
Lambda Value =  0.89

Fold  1
Performance Training =  0.5616907791713825
Performance Validation =  0.6130932855111919


Fold  2
Performance Training =  0.5413274352639573
Performance Validation =  0.6419872972836888


Fold  3
Performance Training =  0.5537085496867142
Performance Validation =  0.4094747453197348

```
Fold  4
Performance Training =  0.652878081411476
Performance Validation =  0.4036786273437354

Average Performance in Training =  0.5774012113833825
Average Performance in Validation =  0.5170584888645877
------------------------------------------------------

M Value =  8
Lambda Value =  0.9

Fold  1
Performance Training =  0.5608681491464416
Performance Validation =  0.6118899168824271

Fold  2
Performance Training =  0.5404865127669822
Performance Validation =  0.6408352620249455

Fold  3
Performance Training =  0.5528867344420422
Performance Validation =  0.40806741761872234

Fold  4
Performance Training =  0.6520327223359992
Performance Validation =  0.40326147257718514

Average Performance in Training =  0.5765685296728663
Average Performance in Validation =  0.51601351727582
------------------------------------------------------

M Value =  8
Lambda Value =  0.91

Fold  1
Performance Training =  0.5600485140582645
Performance Validation =  0.6106818206461035

Fold  2
Performance Training =  0.5396482575815085
Performance Validation =  0.6396857067617764

Fold  3
Performance Training =  0.5520663890063825
Performance Validation =  0.4066662092581027

Fold  4
Performance Training =  0.651187891192943
Performance Validation =  0.4028444905973838

Average Performance in Training =  0.5757377629597746
Average Performance in Validation =  0.5149695568158417
------------------------------------------------------

M Value =  8
```

```
Lambda Value =  0.92

Fold  1
Performance Training =  0.5592318540055123
Performance Validation =  0.6094692879346151

Fold  2
Performance Training =  0.5388126709348958
Performance Validation =  0.6385386764823748

Fold  3
Performance Training =  0.5512475298799894
Performance Validation =  0.4052710736894367

Fold  4
Performance Training =  0.6503436333903663
Performance Validation =  0.4024276866122831

Average Performance in Training =  0.574908922052691
Average Performance in Validation =  0.5139266811796774
----------------------------------------------------

M Value =  8
Lambda Value =  0.93

Fold  1
Performance Training =  0.5584181500236245
Performance Validation =  0.6082525997639794

Fold  2
Performance Training =  0.537979754055655
Performance Validation =  0.6373942145733711

Fold  3
Performance Training =  0.5504301734368731
Performance Validation =  0.4038819654378015

Fold  4
Performance Training =  0.6494999932333572
Performance Validation =  0.4020110665016774

Average Performance in Training =  0.5740820176873774
Average Performance in Validation =  0.5128849615692074
----------------------------------------------------

M Value =  8
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.5576073840132139
Performance Validation =  0.6070320274326386

Fold  2
Performance Training =  0.5371495081464248
Performance Validation =  0.636252362853686
```

Fold  3
Performance Training =  0.549614335898676
Performance Validation =  0.40249884004385295

Fold  4
Performance Training =  0.6486570139384826
Performance Validation =  0.40159463675148444

Average Performance in Training =  0.5732570604991993
Average Performance in Validation =  0.5118444667704155
----------------------------------------------------

M Value =  8
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.5567995386736555
Performance Validation =  0.6058078329004204

Fold  2
Performance Training =  0.5363219343597165
Performance Validation =  0.6351131616083787

Fold  3
Performance Training =  0.5488000333111429
Performance Validation =  0.4011216540097189

Fold  4
Performance Training =  0.647814737648782
Performance Validation =  0.40117840439286034

Average Performance in Training =  0.5724340609983243
Average Performance in Validation =  0.5108052632278446
----------------------------------------------------

M Value =  8
Lambda Value =  0.96

Fold  1
Performance Training =  0.5559945974414879
Performance Validation =  0.6045802691489313

Fold  2
Performance Training =  0.5354970337761848
Performance Validation =  0.633976649622408

Fold  3
Performance Training =  0.5479872815229772
Performance Validation =  0.39975036474841874

Fold  4
Performance Training =  0.646973205449221
Performance Validation =  0.40076237694579486

Average Performance in Training =  0.5716130295474677
Average Performance in Validation =  0.5097674151163882

```
---------------------------------------------------
M Value =  8
Lambda Value =  0.97

Fold  1
Performance Training =  0.5551925444332733
Performance Validation =  0.6033495805244999

Fold  2
Performance Training =  0.5346748073852253
Performance Validation =  0.6328428642142554

Fold  3
Performance Training =  0.5471760961668996
Performance Validation =  0.39838493053659296

Fold  4
Performance Training =  0.6461324573825321
Performance Validation =  0.4003465623668576

Average Performance in Training =  0.5707939763419826
Average Performance in Validation =  0.5087309844105514
---------------------------------------------------

M Value =  8
Lambda Value =  0.98

Fold  1
Performance Training =  0.5543933643925941
Performance Validation =  0.6021160030647624

Fold  2
Performance Training =  0.5338552560676978
Performance Validation =  0.6317118412693348

Fold  3
Performance Training =  0.5463664926427318
Performance Validation =  0.3970253104702831

Fold  4
Performance Training =  0.645292532465374
Performance Validation =  0.3999309690007956

Average Performance in Training =  0.5699769113920994
Average Performance in Validation =  0.5076960309512939
---------------------------------------------------

M Value =  8
Lambda Value =  0.99

Fold  1
Performance Training =  0.5535970426408845
Performance Validation =  0.6008797648098534

Fold  2
```

```
Performance Training =  0.5330383805806029
Performance Validation =  0.6305836152731552


Fold  3
Performance Training =  0.5455584861023499
Performance Validation =  0.39567146442356604


Fold  4
Performance Training =  0.6444534687047496
Performance Validation =  0.3995156055357041


Average Performance in Training =  0.5691618445071467
Average Performance in Validation =  0.5066626125105698
------------------------------------------------------

M Value =  8
Lambda Value =  1.0

Fold  1
Performance Training =  0.5528035650318246
Performance Validation =  0.5996410860991347


Fold  2
Performance Training =  0.5322241815435487
Performance Validation =  0.6294582193441771


Fold  3
Performance Training =  0.5447520914363541
Performance Validation =  0.39432335300984034


Fold  4
Performance Training =  0.6436153031146252
Performance Validation =  0.39910048096151407


Average Performance in Training =  0.568348785281588
Average Performance in Validation =  0.5056307848536665
------------------------------------------------------

M Value =  8
Lambda Value =  1.01

Fold  1
Performance Training =  0.5520129179090315
Performance Validation =  0.5984001798542915


Fold  2
Performance Training =  0.5314126594268538
Performance Validation =  0.6283356852663329


Fold  3
Performance Training =  0.5439473232623246
Performance Validation =  0.39298093754557417


Fold  4
Performance Training =  0.6427780717327061
Performance Validation =  0.3986856045315561
```

```
Average Performance in Training =  0.5675377430827291
Average Performance in Validation =  0.5046006017994387
----------------------------------------------------

M Value =  8
Lambda Value =  1.02

Fold  1
Performance Training =  0.5512250880668232
Performance Validation =  0.5971572518495941

Fold  2
Performance Training =  0.530603814541154
Performance Validation =  0.6272160435211707

Fold  3
Performance Training =  0.543144195914536
Performance Validation =  0.3916441800163565

Fold  4
Performance Training =  0.6419418096373166
Performance Validation =  0.39827098572698494

Average Performance in Training =  0.5667287270399575
Average Performance in Validation =  0.5035721152785265
----------------------------------------------------

M Value =  8
Lambda Value =  1.03

Fold  1
Performance Training =  0.5504400627138274
Performance Validation =  0.5959125009700539

Fold  2
Performance Training =  0.5297976470283821
Performance Validation =  0.6260993233195944

Fold  3
Performance Training =  0.54234272343501
Performance Validation =  0.39031304304508807

Fold  4
Performance Training =  0.6411065509643532
Performance Validation =  0.39785663422386086

Average Performance in Training =  0.5659217460353931
Average Performance in Validation =  0.5025453753896493
----------------------------------------------------

M Value =  8
Lambda Value =  1.04

Fold  1
Performance Training =  0.549657829439235
```

Performance Validation =  0.594666119458151

Fold  2
Performance Training =  0.5289941568540075
Performance Validation =  0.6249855526331747

Fold  3
Performance Training =  0.541542919565808
Performance Validation =  0.38898748986216736

Fold  4
Performance Training =  0.6402723289242618
Performance Validation =  0.3974425598626966

Average Performance in Training =  0.565116808695828
Average Performance in Validation =  0.5015204304540474
------------------------------------------------------

M Value =  8
Lambda Value =  1.05

Fold  1
Performance Training =  0.5488783761815133
Performance Validation =  0.5934182931497737

Fold  2
Performance Training =  0.528193343800426
Performance Validation =  0.623874758225003

Fold  3
Performance Training =  0.5407447977424561
Performance Validation =  0.38766748427754594

Fold  4
Performance Training =  0.6394391758190175
Performance Validation =  0.39702877262030245

Average Performance in Training =  0.5643139233858532
Average Performance in Validation =  0.5004973270681563
------------------------------------------------------

M Value =  8
Lambda Value =  1.06

Fold  1
Performance Training =  0.5481016911993999
Performance Validation =  0.5921692016999528

Fold  2
Performance Training =  0.5273952074614001
Performance Validation =  0.6227669656800787

Fold  3
Performance Training =  0.5399483710884148
Performance Validation =  0.3863529906545057

```
Fold  4
Performance Training =  0.6386071230590746
Performance Validation =  0.3966152825837608

Average Performance in Training =  0.5635130982020724
Average Performance in Validation =  0.49947611015457444
-------------------------------------------------------

M Value =  8
Lambda Value =  1.07

Fold  1
Performance Training =  0.5473277630450235
Performance Validation =  0.5909190187989524

Fold  2
Performance Training =  0.526599747237465
Performance Validation =  0.6216621994352061

Fold  3
Performance Training =  0.5391536524105092
Performance Validation =  0.3850439738850703

Fold  4
Performance Training =  0.6377762011802522
Performance Validation =  0.3962020999263878

Average Performance in Training =  0.5627143409683125
Average Performance in Validation =  0.49845682301140415
-------------------------------------------------------

M Value =  8
Lambda Value =  1.08

Fold  1
Performance Training =  0.5465565805389943
Performance Validation =  0.5896679123792211

Fold  2
Performance Training =  0.5258069623322075
Performance Validation =  0.6205604828083902

Fold  3
Performance Training =  0.538360654195241
Performance Validation =  0.3837403993669235

Fold  4
Performance Training =  0.6369464398605448
Performance Validation =  0.39578923488553763

Average Performance in Training =  0.5619176592317469
Average Performance in Validation =  0.49743950736001813
-------------------------------------------------------

M Value =  8
Lambda Value =  1.09
```

```
Fold  1
Performance Training =  0.5457881327473311
Performance Validation =  0.5884160448136924

Fold  2
Performance Training =  0.525016851749349
Performance Validation =  0.6194618380277215

Fold  3
Performance Training =  0.537569388605907
Performance Validation =  0.3824422329817353

Fold  4
Performance Training =  0.6361178679368249
Performance Validation =  0.395376697742127

Average Performance in Training =  0.5611230602598529
Average Performance in Validation =  0.496424203391319
---------------------------------------------------

M Value =  9
Lambda Value =  0.01

Fold  1
Performance Training =  0.7071121577451902
Performance Validation =  0.5441038677915631

Fold  2
Performance Training =  0.6974683154200602
Performance Validation =  0.7610358484603521

Fold  3
Performance Training =  0.6843849765472441
Performance Validation =  0.6462304289438021

Fold  4
Performance Training =  0.7564968720957356
Performance Validation =  0.5345830725323302

Average Performance in Training =  0.7113655804520574
Average Performance in Validation =  0.6214883044320119
---------------------------------------------------

M Value =  9
Lambda Value =  0.02

Fold  1
Performance Training =  0.6899013611347975
Performance Validation =  0.4899181382398764

Fold  2
Performance Training =  0.6710355212336381
Performance Validation =  0.7552229169973699

Fold  3
```

Performance Training =  0.6635739234622683
Performance Validation =  0.6155359449898777


Fold  4
Performance Training =  0.7418923084020909
Performance Validation =  0.5029665085715332


Average Performance in Training =  0.6916007785581987
Average Performance in Validation =  0.5909108771996643
-------------------------------------------------------


M Value =  9
Lambda Value =  0.03

Fold  1
Performance Training =  0.6801504954867155
Performance Validation =  0.47872806794424416


Fold  2
Performance Training =  0.6562216242188561
Performance Validation =  0.750156859595963


Fold  3
Performance Training =  0.6522249983022287
Performance Validation =  0.5982935415989853


Fold  4
Performance Training =  0.7339873755675843
Performance Validation =  0.4865204700023269


Average Performance in Training =  0.6806461233938461
Average Performance in Validation =  0.5784247347853798
-------------------------------------------------------


M Value =  9
Lambda Value =  0.04

Fold  1
Performance Training =  0.6735563126619661
Performance Validation =  0.4821371141759012


Fold  2
Performance Training =  0.6467608882617393
Performance Validation =  0.7464044149362659


Fold  3
Performance Training =  0.6450579842792827
Performance Validation =  0.5869623884898072


Fold  4
Performance Training =  0.7290402471389432
Performance Validation =  0.4762980653936759


Average Performance in Training =  0.6736038580854828
Average Performance in Validation =  0.5729504957489125
-------------------------------------------------------

M Value =  9
Lambda Value =  0.05

Fold  1
Performance Training =  0.6685730377729122
Performance Validation =  0.49085626788785064

Fold  2
Performance Training =  0.6401234449108884
Performance Validation =  0.7435267892477075

Fold  3
Performance Training =  0.6400493983250415
Performance Validation =  0.5786944497732192

Fold  4
Performance Training =  0.7256175682713446
Performance Validation =  0.46923510429396453

Average Performance in Training =  0.6685908623200467
Average Performance in Validation =  0.5705781528006855
------------------------------------------------------

M Value =  9
Lambda Value =  0.06

Fold  1
Performance Training =  0.6645336186479786
Performance Validation =  0.5013448511088227

Fold  2
Performance Training =  0.6351431029164427
Performance Validation =  0.7412130219061572

Fold  3
Performance Training =  0.6362904066910454
Performance Validation =  0.5722136752071736

Fold  4
Performance Training =  0.7230745101697436
Performance Validation =  0.4640061340495889

Average Performance in Training =  0.6647604096063027
Average Performance in Validation =  0.5696944205679356
------------------------------------------------------

M Value =  9
Lambda Value =  0.07

Fold  1
Performance Training =  0.6611061756999361
Performance Validation =  0.5121276975620948

Fold  2
Performance Training =  0.631214889528048

```
Performance Validation =  0.7392734507577257


Fold  3
Performance Training =  0.6333171832686072
Performance Validation =  0.5668678521796434


Fold  4
Performance Training =  0.7210812711895487
Performance Validation =  0.45994351753799634


Average Performance in Training =  0.6616798799215351
Average Performance in Validation =  0.5695531295093651
------------------------------------------------------

M Value =  9
Lambda Value =  0.08

Fold  1
Performance Training =  0.658106767261835
Performance Validation =  0.5225711685959136


Fold  2
Performance Training =  0.6279954478972687
Performance Validation =  0.7375910396575155


Fold  3
Performance Training =  0.6308694964831705
Performance Validation =  0.5622898040115314


Fold  4
Performance Training =  0.7194524329497566
Performance Validation =  0.4566731658907135


Average Performance in Training =  0.6591060361480077
Average Performance in Validation =  0.5697812945389185
------------------------------------------------------

M Value =  9
Lambda Value =  0.09

Fold  1
Performance Training =  0.6554243899160838
Performance Validation =  0.5324133771701253


Fold  2
Performance Training =  0.6252759292216454
Performance Validation =  0.7360909916310323


Fold  3
Performance Training =  0.628790426062286
Performance Validation =  0.5582571354558021


Fold  4
Performance Training =  0.7180760172331389
Performance Validation =  0.4539682891387551
```

```
Average Performance in Training =  0.6568916906082884
Average Performance in Validation =  0.5701824483489287
-------------------------------------------------------

M Value =  9
Lambda Value =  0.1

Fold  1
Performance Training =  0.65298727238264
Performance Validation =  0.5415646288563714

Fold  2
Performance Training =  0.6229221511472949
Performance Validation =  0.7347237179889856

Fold  3
Performance Training =  0.6269798324537452
Performance Validation =  0.5546272135075503

Fold  4
Performance Training =  0.7168805181687371
Performance Validation =  0.451682796199413

Average Performance in Training =  0.6549424435381043
Average Performance in Validation =  0.5706495891380801
-------------------------------------------------------

M Value =  9
Lambda Value =  0.11

Fold  1
Performance Training =  0.6507463017072468
Performance Validation =  0.5500163758968419

Fold  2
Performance Training =  0.6208439954878751
Performance Validation =  0.7334552177780276

Fold  3
Performance Training =  0.6253708197674724
Performance Validation =  0.5513042561910426

Fold  4
Performance Training =  0.7158181911141088
Performance Validation =  0.4497179380034302

Average Performance in Training =  0.6531948270191759
Average Performance in Validation =  0.5711234469673356
-------------------------------------------------------

M Value =  9
Lambda Value =  0.12

Fold  1
Performance Training =  0.6486662580991553
Performance Validation =  0.5577975889013486
```

```
Fold  2
Performance Training =  0.6189786804187138
Performance Validation =  0.7322614741516755


Fold  3
Performance Training =  0.6239169808213307
Performance Validation =  0.5482214667800966


Fold  4
Performance Training =  0.7148559744469474
Performance Validation =  0.4480043057286712


Average Performance in Training =  0.6516044734465368
Average Performance in Validation =  0.571571208890448
-----------------------------------------------------


M Value =  9
Lambda Value =  0.13


Fold  1
Performance Training =  0.6467208887039989
Performance Validation =  0.5649532013619802


Fold  2
Performance Training =  0.617281102833865
Performance Validation =  0.7311250760510002


Fold  3
Performance Training =  0.6225850857031714
Performance Validation =  0.5453307670900268


Fold  4
Performance Training =  0.7139702716305434
Performance Validation =  0.44649151230529327


Average Performance in Training =  0.6501393372178946
Average Performance in Validation =  0.5719751392020751
-----------------------------------------------------


M Value =  9
Lambda Value =  0.14


Fold  1
Performance Training =  0.6448899908233223
Performance Validation =  0.5715333253045028


Fold  2
Performance Training =  0.6157180019797135
Performance Validation =  0.7300331127408681


Fold  3
Performance Training =  0.621350690149219
Performance Validation =  0.5425966118981483


Fold  4
```

```
Performance Training =  0.7131438082077359
Performance Validation =  0.445141976170358

Average Performance in Training =  0.6487756227899977
Average Performance in Validation =  0.5723262565284692
-----------------------------------------------------

M Value =  9
Lambda Value =  0.15

Fold  1
Performance Training =  0.6431576044840116
Performance Validation =  0.5775879054719679

Fold  2
Performance Training =  0.6142642929549041
Performance Validation =  0.7289758208653225

Fold  3
Performance Training =  0.6201953912701084
Performance Validation =  0.5399921103118368

Fold  4
Performance Training =  0.7123636622444097
Performance Validation =  0.4439270163680986

Average Performance in Training =  0.6474952377383585
Average Performance in Validation =  0.5726207132543064
-----------------------------------------------------

M Value =  9
Lambda Value =  0.16

Fold  1
Performance Training =  0.6415108463953132
Performance Validation =  0.5831641817835066

Fold  2
Performance Training =  0.6129006852256447
Performance Validation =  0.7279456905582691

Fold  3
Performance Training =  0.6191050534139535
Performance Validation =  0.5374965090116479

Fold  4
Performance Training =  0.7116199876107365
Performance Validation =  0.4428243104353351

Average Performance in Training =  0.6462841431614119
Average Performance in Validation =  0.5728576729471897
-----------------------------------------------------

M Value =  9
Lambda Value =  0.17
```

```
Fold  1
Performance Training =  0.639939130161826
Performance Validation =  0.5883056172284313

Fold  2
Performance Training =  0.6116120902123032
Performance Validation =  0.726936859794417

Fold  3
Performance Training =  0.6180686268038948
Performance Validation =  0.5350935099828928

Fold  4
Performance Training =  0.7109051617452297
Performance Validation =  0.44181618764940367

Average Performance in Training =  0.6451312522308135
Average Performance in Validation =  0.5730380436637862
------------------------------------------------------

M Value =  9
Lambda Value =  0.18

Fold  1
Performance Training =  0.6384336277445217
Performance Validation =  0.5930515876452156

Fold  2
Performance Training =  0.6103865289562179
Performance Validation =  0.7259446945604991

Fold  3
Performance Training =  0.6170773401805623
Performance Validation =  0.5327701164088463

Fold  4
Performance Training =  0.7102132019771605
Performance Validation =  0.44088845188681647

Average Performance in Training =  0.6440276747146156
Average Performance in Validation =  0.5731637126253444
------------------------------------------------------

M Value =  9
Lambda Value =  0.19

Fold  1
Performance Training =  0.6369868866455834
Performance Validation =  0.5974374581391211

Fold  2
Performance Training =  0.6092143656524289
Performance Validation =  0.7249654917316792

Fold  3
Performance Training =  0.6161241361707491
```

```
Performance Validation =  0.5305158224850303


Fold  4
Performance Training =  0.7095393566140584
Performance Validation =  0.44002955030345736


Average Performance in Training =  0.642966186270705
Average Performance in Validation =  0.573237080664822
-------------------------------------------------------


M Value =  9
Lambda Value =  0.2


Fold  1
Performance Training =  0.6355925506675075
Performance Validation =  0.6014948440907143


Fold  2
Performance Training =  0.6080877588346079
Performance Validation =  0.7239962647710207


Fold  3
Performance Training =  0.6152032681774995
Performance Validation =  0.5283220328931094


Fold  4
Performance Training =  0.7088798126294886
Performance Validation =  0.439229973788845


Average Performance in Training =  0.6419408475772759
Average Performance in Validation =  0.5732607788859223
-------------------------------------------------------


M Value =  9
Lambda Value =  0.21


Fold  1
Performance Training =  0.6342451514699547
Performance Validation =  0.605251948004499


Fold  2
Performance Training =  0.6070002611826166
Performance Validation =  0.7230345864651344


Fold  3
Performance Training =  0.6143100071892158
Performance Validation =  0.5261816391186331


Fold  4
Performance Training =  0.7082314828935719
Performance Validation =  0.4384818164027411


Average Performance in Training =  0.6409467256838397
Average Performance in Validation =  0.5732374974977519
-------------------------------------------------------
```

```
M Value =  9
Lambda Value =  0.22

Fold  1
Performance Training =  0.6329399497446012
Performance Validation =  0.6087339144619239

Fold  2
Performance Training =  0.6059465228571137
Performance Validation =  0.7220784716679742

Fold  3
Performance Training =  0.6134404249165926
Performance Validation =  0.5240887050684525

Fold  4
Performance Training =  0.7075918487601676
Performance Validation =  0.43777844615237327

Average Performance in Training =  0.6399796865696188
Average Performance in Validation =  0.5731698843376809
-----------------------------------------------------

M Value =  9
Lambda Value =  0.23

Fold  1
Performance Training =  0.631672811967674
Performance Validation =  0.6119631735858367

Fold  2
Performance Training =  0.6049220682617054
Performance Validation =  0.7211262885887761

Fold  3
Performance Training =  0.6125912309107345
Performance Validation =  0.5220382302582266

Fold  4
Performance Training =  0.7069588418794703
Performance Validation =  0.4371142552177899

Average Performance in Training =  0.6390362382548961
Average Performance in Validation =  0.5730604869126573
-----------------------------------------------------

M Value =  9
Lambda Value =  0.24

Fold  1
Performance Training =  0.6304401132002146
Performance Validation =  0.6149597589750335

Fold  2
Performance Training =  0.6039231257474102
Performance Validation =  0.7201766907670621
```

Fold  3
Performance Training =  0.6117596485007406
Performance Validation =  0.5200259689720228


Fold  4
Performance Training =  0.7063307542641071
Performance Validation =  0.43648446783659745


Average Performance in Training =  0.6381134104281181
Average Performance in Validation =  0.572911721637679
------------------------------------------------------


M Value =  9
Lambda Value =  0.25


Fold  1
Performance Training =  0.6292386593244551
Performance Validation =  0.6177415945965539


Fold  2
Performance Training =  0.6029464960678486
Performance Validation =  0.7192285642600211


Fold  3
Performance Training =  0.6109433190775679
Performance Validation =  0.5180482904255601


Fold  4
Performance Training =  0.7057061690118815
Performance Validation =  0.4358849906843483


Average Performance in Training =  0.6372086608704384
Average Performance in Validation =  0.5727258599916208
------------------------------------------------------


M Value =  9
Lambda Value =  0.26


Fold  1
Performance Training =  0.6280656240353912
Performance Validation =  0.6203247497028306


Fold  2
Performance Training =  0.6019894495924899
Performance Validation =  0.7182809861686807


Fold  3
Performance Training =  0.6101402273697443
Performance Validation =  0.5161020693873981


Fold  4
Performance Training =  0.7050839063388927
Performance Validation =  0.435312295018215


Average Performance in Training =  0.6363198018341296

Average Performance in Validation =  0.5725050250692811
------------------------------------------------------

M Value =  9
Lambda Value =  0.27

Fold  1
Performance Training =  0.6269184972107041
Performance Validation =  0.6227236631921601

Fold  2
Performance Training =  0.6010496451358768
Performance Validation =  0.7173331917226897

Fold  3
Performance Training =  0.6093486424677806
Performance Validation =  0.5141845997152721

Fold  4
Performance Training =  0.7044629811040377
Performance Validation =  0.43476332286981234

Average Performance in Training =  0.6354449414795997
Average Performance in Validation =  0.5722511943749835
------------------------------------------------------

M Value =  9
Lambda Value =  0.28

Fold  1
Performance Training =  0.6257950421802305
Performance Validation =  0.6249513399301692

Fold  2
Performance Training =  0.6001250652271758
Performance Validation =  0.7163845479015638

Fold  3
Performance Training =  0.6085670708067193
Performance Validation =  0.5122935253372629

Fold  4
Performance Training =  0.7038425690591263
Performance Validation =  0.4342354116633821

Average Performance in Training =  0.6345824368183131
Average Performance in Validation =  0.5719662062080945
------------------------------------------------------

M Value =  9
Lambda Value =  0.29

Fold  1
Performance Training =  0.624693260045965
Performance Validation =  0.6270195219544002

```
Fold  2
Performance Training =  0.5992139640211542
Performance Validation =  0.7154345321030994


Fold  3
Performance Training =  0.60779421833062
Performance Validation =  0.5104267846589534


Fold  4
Performance Training =  0.7032219797960211
Performance Validation =  0.4337262331055136


Average Performance in Training =  0.63373085554844
Average Performance in Validation =  0.5716517679554917
-----------------------------------------------------

M Value =  9
Lambda Value =  0.3

Fold  1
Performance Training =  0.6236113596527636
Performance Validation =  0.6289388375136393


Fold  2
Performance Training =  0.5983148250288666
Performance Validation =  0.7144827147492161


Fold  3
Performance Training =  0.607028959781072
Performance Validation =  0.5085825654089414


Fold  4
Performance Training =  0.7026006348852915
Performance Validation =  0.4332337432410749


Average Performance in Training =  0.6328889448369984
Average Performance in Validation =  0.5713094652282179
-----------------------------------------------------

M Value =  9
Lambda Value =  0.31

Fold  1
Performance Training =  0.6225477321354602
Performance Validation =  0.6307189307314265


Fold  2
Performance Training =  0.5974263265488169
Performance Validation =  0.7135287449931449


Fold  3
Performance Training =  0.6062703135669805
Performance Validation =  0.5067592676767281


Fold  4
Performance Training =  0.7019780500767694
```

Performance Validation =  0.43275614132774787

Average Performance in Training =  0.6320556055820068
Average Performance in Validation =  0.5709407711822618
--------------------------------------------------------

M Value =  9
Lambda Value =  0.32

Fold  1
Performance Training =  0.6215009292075342
Performance Validation =  0.6323685744332805

Fold  2
Performance Training =  0.5965473131904094
Performance Validation =  0.7125723388915077

Fold  3
Performance Training =  0.6055174210468537
Performance Validation =  0.5049554734370576

Fold  4
Performance Training =  0.7013538207057701
Performance Validation =  0.4322918357358162

Average Performance in Training =  0.6312298710376418
Average Performance in Validation =  0.5705470556244155
--------------------------------------------------------

M Value =  9
Lambda Value =  0.33

Fold  1
Performance Training =  0.6204696445350488
Performance Validation =  0.6338957683979005

Fold  2
Performance Training =  0.5956767722574268
Performance Validation =  0.7116132695520451

Fold  3
Performance Training =  0.6047695293293642
Performance Validation =  0.5031699212524743

Fold  4
Performance Training =  0.7007276096497295
Performance Validation =  0.431839415489934

Average Performance in Training =  0.6304108889428923
Average Performance in Validation =  0.5701295936730885
--------------------------------------------------------

M Value =  9
Lambda Value =  0.34

Fold  1

```
Performance Training =  0.6194526976744765
Performance Validation =  0.6353078250151645


Fold  2
Performance Training =  0.5948138140387105
Performance Validation =  0.7106513588774159


Fold  3
Performance Training =  0.6040259769016426
Performance Validation =  0.501401485141572


Fold  4
Performance Training =  0.7000991373293297
Performance Validation =  0.4313976263762378


Average Performance in Training =  0.6295979064860397
Average Performance in Validation =  0.5696895738525976
─────────────────────────────────────────────────

M Value =  9
Lambda Value =  0.35000000000000003


Fold  1
Performance Training =  0.6184490201561843
Performance Validation =  0.6366114440742681


Fold  2
Performance Training =  0.5939576552629637
Performance Validation =  0.7096864706080271


Fold  3
Performance Training =  0.6032861815473824
Performance Validation =  0.499649156822744


Fold  4
Performance Training =  0.6994681733601988
Performance Validation =  0.43096535076968656


Average Performance in Training =  0.6287902575816824
Average Performance in Validation =  0.5692281055686814
─────────────────────────────────────────────────

M Value =  9
Lambda Value =  0.36


Fold  1
Performance Training =  0.6174576433751118
Performance Validation =  0.6378127781707484


Fold  2
Performance Training =  0.5931076051334969
Performance Validation =  0.7087185044294904


Fold  3
Performance Training =  0.6025496301322701
Performance Validation =  0.49791203071171675
```

```
Fold  4
Performance Training =  0.6988345295460472
Performance Validation =  0.4305415905129897

Average Performance in Training =  0.6279873520467315
Average Performance in Validation =  0.5687462259562364
------------------------------------------------------

M Value =  9
Lambda Value =  0.37

Fold  1
Performance Training =  0.616477688012482
Performance Validation =  0.6389174900135652

Fold  2
Performance Training =  0.5922630534801563
Performance Validation =  0.7077473909583138

Fold  3
Performance Training =  0.6018158699223359
Performance Validation =  0.49618929118003163

Fold  4
Performance Training =  0.6981980539688498
Performance Validation =  0.4301254523141742

Average Performance in Training =  0.627188666345956
Average Performance in Validation =  0.5682449061165212
------------------------------------------------------

M Value =  9
Lambda Value =  0.38

Fold  1
Performance Training =  0.6155083547615412
Performance Validation =  0.6399308027322692

Fold  2
Performance Training =  0.5914234606592335
Performance Validation =  0.706773087456499

Fold  3
Performance Training =  0.6010845011685773
Performance Validation =  0.4944802016810316

Fold  4
Performance Training =  0.6975586259814937
Performance Validation =  0.42971613523498386

Average Performance in Training =  0.6263937356427114
Average Performance in Validation =  0.567725056776196
------------------------------------------------------

M Value =  9
```

Lambda Value =  0.39

Fold  1
Performance Training =  0.614548916169449
Performance Validation =  0.6408575441276567

Fold  2
Performance Training =  0.5905883489047936
Performance Validation =  0.7057955741545826

Fold  3
Performance Training =  0.6003551707437838
Performance Validation =  0.4927840954271828

Fold  4
Performance Training =  0.6969161519469553
Performance Validation =  0.4293129199244834

Average Performance in Training =  0.6256021469412454
Average Performance in Validation =  0.5671875334084764
----------------------------------------------------

M Value =  9
Lambda Value =  0.4

Fold  1
Performance Training =  0.6135987094388251
Performance Validation =  0.6417021856746903

Fold  2
Performance Training =  0.589757294891674
Performance Validation =  0.7048148510852938

Fold  3
Performance Training =  0.5996275666585381
Performance Validation =  0.4911003673629276

Fold  4
Performance Training =  0.6962705615982593
Performance Validation =  0.4289151593168461

Average Performance in Training =  0.6248135331468241
Average Performance in Validation =  0.5666331408599394
----------------------------------------------------

M Value =  9
Lambda Value =  0.41000000000000003

Fold  1
Performance Training =  0.6126571300578574
Performance Validation =  0.642468876971177

Fold  2
Performance Training =  0.5889299233151646
Performance Validation =  0.7038309353478944

Fold  3
Performance Training =  0.5989014133156858
Performance Validation =  0.4894284672249901


Fold  4
Performance Training =  0.695621804917199
Performance Validation =  0.428522270563542


Average Performance in Training =  0.6240275679014767
Average Performance in Validation =  0.5660626375269009
----------------------------------------------------

M Value =  9
Lambda Value =  0.42

Fold  1
Performance Training =  0.6117236261485495
Performance Validation =  0.643161476227264


Fold  2
Performance Training =  0.5881059013278613
Performance Validation =  0.7028438587374941


Fold  3
Performance Training =  0.5981764673881758
Performance Validation =  0.48776789351986805


Fold  4
Performance Training =  0.6949698494486043
Performance Validation =  0.42813372801096117


Average Performance in Training =  0.6232439610782977
Average Performance in Validation =  0.5654767391238968
----------------------------------------------------

M Value =  9
Lambda Value =  0.43

Fold  1
Performance Training =  0.6107976934396339
Performance Validation =  0.6437835773068633


Fold  2
Performance Training =  0.5872849337024997
Performance Validation =  0.7018536656850167


Fold  3
Performance Training =  0.5974525142255735
Performance Validation =  0.486118188278334


Fold  4
Performance Training =  0.6943146779819
Performance Validation =  0.42774905706726984


Average Performance in Training =  0.6224624548374018
Average Performance in Validation =  0.564876122084371

```
---------------------------------------------------

M Value =  9
Lambda Value =  0.44

Fold  1
Performance Training =  0.6098788707846692
Performance Validation =  0.644338533760497

Fold  2
Performance Training =  0.586466758612301
Performance Validation =  0.7008604114626864

Fold  3
Performance Training =  0.5967293647109373
Performance Validation =  0.48447893247116613

Fold  4
Performance Training =  0.6936562865437004
Performance Validation =  0.42736782882873725

Average Performance in Training =  0.6216828201629019
Average Performance in Validation =  0.5642614266307717
---------------------------------------------------

M Value =  9
Lambda Value =  0.45

Fold  1
Performance Training =  0.6089667361574372
Performance Validation =  0.6448294802281036

Fold  2
Performance Training =  0.5856511439387071
Performance Validation =  0.6998641606173301

Fold  3
Performance Training =  0.596006852502948
Performance Validation =  0.4828497419897262

Fold  4
Performance Training =  0.6929946826548341
Performance Validation =  0.426989655357244

Average Performance in Training =  0.6209048538134816
Average Performance in Validation =  0.563633259548101
---------------------------------------------------

M Value =  9
Lambda Value =  0.46

Fold  1
Performance Training =  0.6080609030664277
Performance Validation =  0.6452593515382159

Fold  2
```

```
Performance Training =  0.5848378840312798
Performance Validation =  0.6988649855998531


Fold  3
Performance Training =  0.595284831608921
Performance Validation =  0.48123026411106296


Fold  4
Performance Training =  0.6923298838130372
Performance Validation =  0.42661418551814934


Average Performance in Training =  0.6201283756299164
Average Performance in Validation =  0.5629921966918203
------------------------------------------------------

M Value =  9
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.6071610173383131
Performance Validation =  0.6456308997856081


Fold  2
Performance Training =  0.5840267968566776
Performance Validation =  0.6978629655642218


Fold  3
Performance Training =  0.5945631742430677
Performance Validation =  0.4796201743800875


Fold  4
Performance Training =  0.6916619161689017
Performance Validation =  0.42624110130207926


Average Performance in Training =  0.61935322615174
Average Performance in Validation =  0.5623387852579992
------------------------------------------------------

M Value =  9
Lambda Value =  0.48

Fold  1
Performance Training =  0.6062667542271416
Performance Validation =  0.6459467096314494


Fold  2
Performance Training =  0.5832177214835974
Performance Validation =  0.6968581853133655


Fold  3
Performance Training =  0.5938417689315448
Performance Validation =  0.4780191738520543


Fold  4
Performance Training =  0.6909908133678948
Performance Validation =  0.42587011456600554
```

Average Performance in Training =  0.6185792645025447
Average Performance in Validation =  0.5616735458407187
------------------------------------------------------

M Value =  9
Lambda Value =  0.49

Fold  1
Performance Training =  0.6053778158117543
Performance Validation =  0.6462092120375941

Fold  2
Performance Training =  0.5824105158587664
Performance Validation =  0.6958507343728078

Fold  3
Performance Training =  0.5931205188317483
Performance Validation =  0.4764269866473463

Fold  4
Performance Training =  0.6903166155355371
Performance Validation =  0.42550096413875726

Average Performance in Training =  0.6178063665094515
Average Performance in Validation =  0.5609969742991263
------------------------------------------------------

M Value =  9
Lambda Value =  0.5

Fold  1
Performance Training =  0.6044939286488338
Performance Validation =  0.6464206966187898

Fold  2
Performance Training =  0.5816050548358701
Performance Validation =  0.6948407061756401

Fold  3
Performance Training =  0.592399340238188
Performance Validation =  0.47484335777781406

Fold  4
Performance Training =  0.6896393683863662
Performance Validation =  0.42513341324425846

Average Performance in Training =  0.6170344230273145
Average Performance in Validation =  0.5603095434541256
------------------------------------------------------

M Value =  9
Lambda Value =  0.51

Fold  1
Performance Training =  0.6036148416531688

```
Performance Validation = 0.6465833227727074


Fold  2
Performance Training = 0.5808012284249369
Performance Validation = 0.6938281973448162


Fold  3
Performance Training = 0.5916781612513587
Performance Validation = 0.47326805120995263


Fold  4
Performance Training = 0.6889591224402398
Performance Validation = 0.4247672472025499


Average Performance in Training = 0.6162633384424261
Average Performance in Validation = 0.5596117046325064
------------------------------------------------------


M Value =  9
Lambda Value =  0.52


Fold  1
Performance Training = 0.6027403241803023
Performance Validation = 0.6466991297271834


Fold  2
Performance Training = 0.579998940234424
Performance Validation = 0.6928133070607034


Fold  3
Performance Training = 0.5909569205894083
Performance Validation = 0.4717008481352397


Fold  4
Performance Training = 0.6882759323319745
Performance Validation = 0.42440227137435316


Average Performance in Training = 0.6154930293340273
Average Performance in Validation = 0.5589038890743698
------------------------------------------------------


M Value =  9
Lambda Value =  0.53


Fold  1
Performance Training = 0.6018701642897961
Performance Validation = 0.6467700456264054


Fold  2
Performance Training = 0.5791981060821871
Performance Validation = 0.6917961365035031


Fold  3
Performance Training = 0.5902355665252592
Performance Validation = 0.4701415454221973
```

```
Fold  4
Performance Training =  0.6875898562023472
Performance Validation =  0.4240383093197093

Average Performance in Training =  0.6147234232748975
Average Performance in Validation =  0.5581865092179539
------------------------------------------------------

M Value =  9
Lambda Value =  0.54

Fold  1
Performance Training =  0.6010041671699795
Performance Validation =  0.6467978957625145

Fold  2
Performance Training =  0.578398652754839
Performance Validation =  0.6907767883615417

Fold  3
Performance Training =  0.5895140559342285
Performance Validation =  0.46858995422823424

Fold  4
Performance Training =  0.6869009551602082
Performance Validation =  0.42367520114526025

Average Performance in Training =  0.6139544577548138
Average Performance in Validation =  0.5574599598743877
------------------------------------------------------

M Value =  9
Lambda Value =  0.55

Fold  1
Performance Training =  0.6001421537073488
Performance Validation =  0.646784410045977

Fold  2
Performance Training =  0.5776005168978149
Performance Validation =  0.6897553663976428

Fold  3
Performance Training =  0.5887923534392248
Performance Validation =  0.46704589875239677

Fold  4
Performance Training =  0.6862092928068746
Performance Validation =  0.4233128020181649

Average Performance in Training =  0.6131860792128158
Average Performance in Validation =  0.5567246193035453
------------------------------------------------------

M Value =  9
Lambda Value =  0.56
```

```
Fold  1
Performance Training =  0.5992839591857457
Performance Validation =  0.6467312297966619

Fold  2
Performance Training =  0.5768036440208216
Performance Validation =  0.6887319750667891

Fold  3
Performance Training =  0.5880704306423066
Performance Validation =  0.46550921511262733

Fold  4
Performance Training =  0.6855149348152016
Performance Validation =  0.42295098082754146

Average Performance in Training =  0.6124182421660189
Average Performance in Validation =  0.5559808502009049
----------------------------------------------------

M Value =  9
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.5984294321021688
Performance Validation =  0.6466399139276977

Fold  2
Performance Training =  0.5760079876053801
Performance Validation =  0.6877067191791617

Fold  3
Performance Training =  0.5873482654328572
Performance Validation =  0.4639797503333358

Fold  4
Performance Training =  0.6848179485567587
Performance Validation =  0.422589618976808

Average Performance in Training =  0.6116509084242912
Average Performance in Validation =  0.5552290006042508
----------------------------------------------------

M Value =  9
Lambda Value =  0.58

Fold  1
Performance Training =  0.5975784330875623
Performance Validation =  0.6465119445856236

Fold  2
Performance Training =  0.5752135083028835
Performance Validation =  0.6866797036033883

Fold  3
```

```
Performance Training = 0.5866258413638712
Performance Validation = 0.4624573614308951


Fold  4
Performance Training = 0.6841184027713962
Performance Validation = 0.4222286092924137


Average Performance in Training =  0.6108840463814282
Average Performance in Validation =  0.5544694047280802
-------------------------------------------------------


M Value =  9
Lambda Value =  0.59


Fold  1
Performance Training = 0.5967308339222357
Performance Validation = 0.6463487323028769


Fold  2
Performance Training = 0.5744201732130745
Performance Validation = 0.6856510330054577


Fold  3
Performance Training = 0.5859031470889151
Performance Validation = 0.4609419145862662


Fold  4
Performance Training = 0.6834163672742583
Performance Validation = 0.42186785503626323


Average Performance in Training =  0.6101176303746209
Average Performance in Validation =  0.5537023837327161
-------------------------------------------------------


M Value =  9
Lambda Value =  0.6


Fold  1
Performance Training = 0.595886516636706
Performance Validation = 0.6461516207121796


Fold  2
Performance Training = 0.5736279552340942
Performance Validation = 0.6846208116193329


Fold  3
Performance Training = 0.5851801758532491
Performance Validation = 0.45943328439529685


Fold  4
Performance Training = 0.6827119126959136
Performance Validation = 0.4215072690107061


Average Performance in Training =  0.6093516401049908
Average Performance in Validation =  0.5529282464343789
-------------------------------------------------------
```

```
M Value =  9
Lambda Value =  0.61

Fold  1
Performance Training =  0.5950453726897571
Performance Validation =  0.6459218908666992

Fold  2
Performance Training =  0.5728368324763601
Performance Validation =  0.6835891430457453

Fold  3
Performance Training =  0.5844569250333798
Performance Validation =  0.45793135318842115

Fold  4
Performance Training =  0.6820051102518351
Performance Validation =  0.42114677274631074

Average Performance in Training =  0.608586060112833
Average Performance in Validation =  0.5521472899617941
------------------------------------------------------

M Value =  9
Lambda Value =  0.62

Fold  1
Performance Training =  0.5942073022163913
Performance Validation =  0.6456607652049237

Fold  2
Performance Training =  0.5720467877334552
Performance Validation =  0.682556130076091

Fold  3
Performance Training =  0.5837333957199904
Performance Validation =  0.4564360104124161

Fold  4
Performance Training =  0.6812960315379286
Performance Validation =  0.42078629576380344

Average Performance in Training =  0.6078208793019414
Average Performance in Validation =  0.5513598003643085
------------------------------------------------------

M Value =  9
Lambda Value =  0.63

Fold  1
Performance Training =  0.5933722133391209
Performance Validation =  0.6453694111948306

Fold  2
Performance Training =  0.5712578080040245
```

Performance Validation =  0.681521874538692

Fold  3
Performance Training =  0.5830095923398095
Performance Validation =  0.4549471520678636

Fold  4
Performance Training =  0.6805847483492098
Performance Validation =  0.42042577490256716

Average Performance in Training =  0.6070560905080411
Average Performance in Validation =  0.5505660531759883
------------------------------------------------------

M Value =  9
Lambda Value =  0.64

Fold  1
Performance Training =  0.592540021536735
Performance Validation =  0.6450489446881252

Fold  2
Performance Training =  0.5704698840593844
Performance Validation =  0.68486477165007

Fold  3
Performance Training =  0.5822855223124628
Performance Validation =  0.4534646801965909

Fold  4
Performance Training =  0.6798713325190877
Performance Validation =  0.42006515370897657

Average Performance in Training =  0.6062916901069175
Average Performance in Validation =  0.5497663139396749
------------------------------------------------------

M Value =  9
Lambda Value =  0.65

Fold  1
Performance Training =  0.5917106490652756
Performance Validation =  0.6447004330119902

Fold  2
Performance Training =  0.5696830100521543
Performance Validation =  0.679450037473648

Fold  3
Performance Training =  0.5815611957388213
Performance Validation =  0.45198850241409816

Fold  4
Performance Training =  0.6791558557770094
Performance Validation =  0.4197043818785985

```
Average Performance in Training =  0.6055276776583152
Average Performance in Validation =  0.5489608386945837
------------------------------------------------------


M Value =  9
Lambda Value =  0.66

Fold  1
Performance Training =  0.5908840244264983
Performance Validation =  0.6443248978228191

Fold  2
Performance Training =  0.5688971831617574
Performance Validation =  0.6784126536703028

Fold  3
Performance Training =  0.5808366251177417
Performance Validation =  0.45051853148249754

Fold  4
Performance Training =  0.6784383896224873
Performance Validation =  0.4193434147469748

Average Performance in Training =  0.6047640555821212
Average Performance in Validation =  0.5481498744306486
------------------------------------------------------


M Value =  9
Lambda Value =  0.67

Fold  1
Performance Training =  0.590060081879562
Performance Validation =  0.6439233177438426

Fold  2
Performance Training =  0.568112403273104
Performance Validation =  0.677374422561864

Fold  3
Performance Training =  0.5801118250884353
Performance Validation =  0.4490546849200343

Fold  4
Performance Training =  0.6777190052137638
Performance Validation =  0.4189822128242675

Average Performance in Training =  0.6040008288637163
Average Performance in Validation =  0.547333659512502
------------------------------------------------------


M Value =  9
Lambda Value =  0.68

Fold  1
Performance Training =  0.5892387609921196
Performance Validation =  0.6434966308062331
```

```
Fold  2
Performance Training =  0.5673286726851754
Performance Validation =  0.6763354394832644


Fold  3
Performance Training =  0.5793868121960037
Performance Validation =  0.4475968846436561


Fold  4
Performance Training =  0.6769977732695582
Performance Validation =  0.41862074136957583


Average Performance in Training =  0.6032380047857142
Average Performance in Validation =  0.5465124240756823
----------------------------------------------------


M Value =  9
Lambda Value =  0.6900000000000001


Fold  1
Performance Training =  0.5884200062273517
Performance Validation =  0.6430457367112692


Fold  2
Performance Training =  0.5665459958465837
Performance Validation =  0.6752957982356644


Fold  3
Performance Training =  0.5786616046779426
Performance Validation =  0.4461450566414933


Fold  4
Performance Training =  0.6762747639825275
Performance Validation =  0.4182589700011733


Average Performance in Training =  0.6024755926836014
Average Performance in Validation =  0.5456863903974001
----------------------------------------------------


M Value =  9
Lambda Value =  0.7000000000000001


Fold  1
Performance Training =  0.5876037665638258
Performance Validation =  0.6425714989293303


Fold  2
Performance Training =  0.5657643791155025
Performance Validation =  0.6742555910348035


Fold  3
Performance Training =  0.5779362222696434
Performance Validation =  0.4446991306724475


Fold  4
```

```
Performance Training =  0.675550046943217
Performance Validation =  0.41789687233931994

Average Performance in Training =  0.6017136037230472
Average Performance in Validation =  0.5448557732439754
------------------------------------------------------

M Value =  9
Lambda Value =  0.71

Fold  1
Performance Training =  0.5867899951453557
Performance Validation =  0.6420747466499295

Fold  2
Performance Training =  0.5649838305416338
Performance Validation =  0.6732149084684246

Fold  3
Performance Training =  0.577210686027132
Performance Validation =  0.4432590399903865

Fold  4
Performance Training =  0.6748236910734156
Performance Validation =  0.4175344256786446

Average Performance in Training =  0.6009520506968842
Average Performance in Validation =  0.5440207801968463
------------------------------------------------------

M Value =  9
Lambda Value =  0.72

Fold  1
Performance Training =  0.5859786489583094
Performance Validation =  0.6415562765955353

Fold  2
Performance Training =  0.5642043596681231
Performance Validation =  0.6721738394618287

Fold  3
Performance Training =  0.5764850181654597
Performance Validation =  0.44182472109068127

Fold  4
Performance Training =  0.6740957645679491
Performance Validation =  0.41717161068740793

Average Performance in Training =  0.6001909478399603
Average Performance in Validation =  0.5431816119588633
------------------------------------------------------

M Value =  9
Lambda Value =  0.73
```

```
Fold  1
Performance Training =  0.5851696885340505
Performance Validation =  0.6410168547107195

Fold  2
Performance Training =  0.5634259773515538
Performance Validation =  0.6711324712506839

Fold  3
Performance Training =  0.5757592419113252
Performance Validation =  0.44039611347709606

Fold  4
Performance Training =  0.6733663348440452
Performance Validation =  0.416808411131226

Average Performance in Training =  0.5994303106602437
Average Performance in Validation =  0.5423384626424314
------------------------------------------------------

M Value =  9
Lambda Value =  0.74

Fold  1
Performance Training =  0.5843630776744104
Performance Validation =  0.6404572177370262

Fold  2
Performance Training =  0.5626486955983369
Performance Validation =  0.6700908893603237

Fold  3
Performance Training =  0.5750333813686472
Performance Validation =  0.4389731594471845

Fold  4
Performance Training =  0.6726354684975029
Performance Validation =  0.4164448136190838

Average Performance in Training =  0.5986701557847243
Average Performance in Validation =  0.5414915200409046
------------------------------------------------------

M Value =  9
Lambda Value =  0.75

Fold  1
Performance Training =  0.5835587831982871
Performance Validation =  0.6398780746829577

Fold  2
Performance Training =  0.5618725274159899
Performance Validation =  0.6690491775908407

Fold  3
Performance Training =  0.5743074613959336
```

Performance Validation =  0.4375558038945909


Fold  4
Performance Training =  0.6719032312649702
Performance Validation =  0.416080807369675


Average Performance in Training =  0.5979105008187953
Average Performance in Validation =  0.5406409658845162
------------------------------------------------------

M Value =  9
Lambda Value =  0.76


Fold  1
Performance Training =  0.5827567747076321
Performance Validation =  0.6392801081975925


Fold  2
Performance Training =  0.5610974866779382
Performance Validation =  0.6680074180073503


Fold  3
Performance Training =  0.5735815074944004
Performance Validation =  0.4361439941267572


Fold  4
Performance Training =  0.6711696879917171
Performance Validation =  0.41571638399630007


Average Performance in Training =  0.5971513642179219
Average Performance in Validation =  0.539786976082
------------------------------------------------------

M Value =  9
Lambda Value =  0.77


Fold  1
Performance Training =  0.581957024371248
Performance Validation =  0.6386639758555566


Fold  2
Performance Training =  0.5603235880006214
Performance Validation =  0.6669656909348676


Fold  3
Performance Training =  0.5728555457059095
Performance Validation =  0.4347376796967336


Fold  4
Performance Training =  0.670434902604346
Performance Validation =  0.41535153730872854


Average Performance in Training =  0.5963927651705312
Average Performance in Validation =  0.5389297209489715
------------------------------------------------------

```
M Value =  9
Lambda Value =  0.78

Fold  1
Performance Training =  0.5811595067249626
Performance Validation =  0.6380303113603241

Fold  2
Performance Training =  0.5595508466317916
Performance Validation =  0.6659240749572887

Fold  3
Performance Training =  0.5721296025198608
Performance Validation =  0.4333368122478626

Fold  4
Performance Training =  0.6696989380879438
Performance Validation =  0.41498626313057996

Average Performance in Training =  0.5956347234911397
Average Performance in Validation =  0.5380693654240137
----------------------------------------------------

M Value =  9
Lambda Value =  0.79

Fold  1
Performance Training =  0.5803641984868578
Performance Validation =  0.6373797256722357

Fold  2
Performance Training =  0.5587792783490075
Performance Validation =  0.6648826469200285

Fold  3
Performance Training =  0.5714037047882798
Performance Validation =  0.43194134537029405

Fold  4
Performance Training =  0.6689618564672261
Performance Validation =  0.4146205591309139

Average Performance in Training =  0.5948772595228428
Average Performance in Validation =  0.537206069273368
----------------------------------------------------

M Value =  9
Lambda Value =  0.8

Fold  1
Performance Training =  0.5795710783863697
Performance Validation =  0.6367128080669949

Fold  2
Performance Training =  0.5580088993674215
Performance Validation =  0.6638414819359046
```

```
Fold  3
Performance Training =  0.5706778796483872
Performance Validation =  0.43055123446828325


Fold  4
Performance Training =  0.6682237187912723
Performance Validation =  0.4142544246688461


Average Performance in Training =  0.5941203940483626
Average Performance in Validation =  0.5363399872850072
-------------------------------------------------------


M Value =  9
Lambda Value =  0.81


Fold  1
Performance Training =  0.5787801270061534
Performance Validation =  0.6360301271299267


Fold  2
Performance Training =  0.5572397262560376
Performance Validation =  0.6628006533938948


Fold  3
Performance Training =  0.5699521544520253
Performance Validation =  0.42916643663744036


Fold  4
Performance Training =  0.6674845851214901
Performance Validation =  0.4138878606501112


Average Performance in Training =  0.5933641482089267
Average Performance in Validation =  0.5354712694528433
-------------------------------------------------------


M Value =  9
Lambda Value =  0.8200000000000001


Fold  1
Performance Training =  0.5779913266357222
Performance Validation =  0.6353322316907928


Fold  2
Performance Training =  0.5564717758617033
Performance Validation =  0.6617602329704408


Fold  3
Performance Training =  0.5692265567013611
Performance Validation =  0.4277869105510914


Fold  4
Performance Training =  0.6667445145224811
Performance Validation =  0.41352086939459853


Average Performance in Training =  0.5926085434303169
```

```
Average Performance in Validation =  0.5346000611517309
-------------------------------------------------------

M Value =  9
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.57720466113594
Performance Validation =  0.6346196517035589

Fold  2
Performance Training =  0.5557050652401568
Performance Validation =  0.6607202906430003

Fold  3
Performance Training =  0.5685011139903354
Performance Validation =  0.42641261635499605

Fold  4
Performance Training =  0.6660035650555121
Performance Validation =  0.4131534545139647

Average Performance in Training =  0.591853601355486
Average Performance in Validation =  0.5337265033038799
-------------------------------------------------------

M Value =  9
Lambda Value =  0.84

Fold  1
Performance Training =  0.5764201158135327
Performance Validation =  0.633892899075108

Fold  2
Performance Training =  0.5549396115935266
Performance Validation =  0.6596808947055699

Fold  3
Performance Training =  0.5677758539513865
Performance Validation =  0.42504351556979336

Fold  4
Performance Training =  0.665261793774331
Performance Validation =  0.41278562079851777

Average Performance in Training =  0.5910993437831942
Average Performance in Validation =  0.5328507325372472
-------------------------------------------------------

M Value =  9
Lambda Value =  0.85

Fold  1
Performance Training =  0.5756376773048484
Performance Validation =  0.6331524684465752
```

```
Fold  2
Performance Training =  0.5541754322137173
Performance Validation =  0.6586421117859422


Fold  3
Performance Training =  0.5670508042070082
Performance Validation =  0.423679571000525


Fold  4
Performance Training =  0.6645192567230804
Performance Validation =  0.4124173741126329


Average Performance in Training =  0.5903457926121636
Average Performance in Validation =  0.5319728813364188
------------------------------------------------------

M Value =  9
Lambda Value =  0.86

Fold  1
Performance Training =  0.5748573334681615
Performance Validation =  0.6323988379306651


Fold  2
Performance Training =  0.5534125444311878
Performance Validation =  0.6576040068644741


Fold  3
Performance Training =  0.5663259923257412
Performance Validation =  0.42232074665269137


Fold  4
Performance Training =  0.6637760089360951
Performance Validation =  0.41204872129802583


Average Performance in Training =  0.5895929697902964
Average Performance in Validation =  0.531093078186464
------------------------------------------------------

M Value =  9
Lambda Value =  0.87

Fold  1
Performance Training =  0.5740790732838774
Performance Validation =  0.6316324698080158


Fold  2
Performance Training =  0.5526509655686508
Performance Validation =  0.6565666432941646


Fold  3
Performance Training =  0.5656014457822431
Performance Validation =  0.42096700765433903


Fold  4
Performance Training =  0.6630321044393901
```

```
Performance Validation =  0.41167967008426476

Average Performance in Training =  0.5888408972685404
Average Performance in Validation =  0.530211447710196
--------------------------------------------------------

M Value =  9
Lambda Value =  0.88

Fold  1
Performance Training =  0.5733028867620391
Performance Validation =  0.6308538111854549

Fold  2
Performance Training =  0.5518907128992854
Performance Validation =  0.6555300828218729

Fold  3
Performance Training =  0.5648771919210941
Performance Validation =  0.4196183201836965

Fold  4
Performance Training =  0.6622875962536541
Performance Validation =  0.41131022900596337

Average Performance in Training =  0.5880895969590182
Average Performance in Validation =  0.5293281107992469
--------------------------------------------------------

M Value =  9
Lambda Value =  0.89

Fold  1
Performance Training =  0.5725287648565924
Performance Validation =  0.6300632946187266

Fold  2
Performance Training =  0.5511318036090698
Performance Validation =  0.6544943856105008

Fold  3
Performance Training =  0.5641532579240423
Performance Validation =  0.4182746514019484

Fold  4
Performance Training =  0.6615425363985945
Performance Validation =  0.41094040732613724

Average Performance in Training =  0.5873390906970748
Average Performance in Validation =  0.5284431847393283
--------------------------------------------------------

M Value =  9
Lambda Value =  0.9

Fold  1
```

```
Performance Training =  0.5717566993859067
Performance Validation =  0.6292613387020891


Fold  2
Performance Training =  0.5503742547628929
Performance Validation =  0.6534596102620037


Fold  3
Performance Training =  0.5634296707804056
Performance Validation =  0.4169359693907444


Fold  4
Performance Training =  0.6607969758984823
Performance Validation =  0.4105702149652489


Average Performance in Training =  0.5865894002069219
Average Performance in Validation =  0.5275567833300215
─────────────────────────────────────────────────

M Value =  9
Lambda Value =  0.91


Fold  1
Performance Training =  0.5709866829590879
Performance Validation =  0.628448348626975


Fold  2
Performance Training =  0.5496180832741235
Performance Validation =  0.6524258138410963


Fold  3
Performance Training =  0.5627064572603792
Performance Validation =  0.4156022430940923


Fold  4
Performance Training =  0.6600509647887713
Performance Validation =  0.4101996624355152


Average Performance in Training =  0.5858405470705905
Average Performance in Validation =  0.5266690169994197
─────────────────────────────────────────────────

M Value =  9
Lambda Value =  0.92


Fold  1
Performance Training =  0.5702187089076605
Performance Validation =  0.6276247167117414


Fold  2
Performance Training =  0.548863305877345
Performance Validation =  0.6513930518995326


Fold  3
Performance Training =  0.5619836438910105
Performance Validation =  0.41427344226429785
```

```
Fold  4
Performance Training =  0.6593045521236627
Performance Validation =  0.40982876078007413

Average Performance in Training =  0.5850925526999196
Average Performance in Validation =  0.5257799929139114
----------------------------------------------------

M Value =  9
Lambda Value =  0.93

Fold  1
Performance Training =  0.5694527712222224
Performance Validation =  0.6267908229043826

Fold  2
Performance Training =  0.5481099391039903
Performance Validation =  0.6503613785008515

Fold  3
Performance Training =  0.5612612569346307
Performance Validation =  0.4129495374116755

Fold  4
Performance Training =  0.6585577859845165
Performance Validation =  0.40945752151665105

Average Performance in Training =  0.58434543831134
Average Performance in Validation =  0.5248898150833902
----------------------------------------------------

M Value =  9
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.5686888644937109
Performance Validation =  0.6259470352599239

Fold  2
Performance Training =  0.5473579992606337
Performance Validation =  0.6493308462454976

Fold  3
Performance Training =  0.5605393223695436
Performance Validation =  0.41163049975770694

Fold  4
Performance Training =  0.6578107134890023
Performance Validation =  0.4090859565853866

Average Performance in Training =  0.5835992249032227
Average Performance in Validation =  0.5239985844621288
----------------------------------------------------

M Value =  9
```

```
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.5679269838589516
Performance Validation =  0.6250937103941029

Fold  2
Performance Training =  0.5466075024097148
Performance Validation =  0.648301506296223

Fold  3
Performance Training =  0.5598178658727946
Performance Validation =  0.41031630119144835

Fold  4
Performance Training =  0.6570633808009058
Performance Validation =  0.4087140783005204

Average Performance in Training =  0.5828539332355916
Average Performance in Validation =  0.5231063990455737
-----------------------------------------------------

M Value =  9
Lambda Value =  0.96

Fold  1
Performance Training =  0.567167124950171
Performance Validation =  0.6242311939147935

Fold  2
Performance Training =  0.5458584643524929
Performance Validation =  0.6472734084036955

Fold  3
Performance Training =  0.5590969128048466
Performance Validation =  0.40900691422890134

Fold  4
Performance Training =  0.6563158331405066
Performance Validation =  0.40834189930564646

Average Performance in Training =  0.5821095838120043
Average Performance in Validation =  0.5222133539632592
-----------------------------------------------------

M Value =  9
Lambda Value =  0.97

Fold  1
Performance Training =  0.5664092838481993
Performance Validation =  0.623359820832568

Fold  2
Performance Training =  0.5451109006140419
Performance Validation =  0.6462466009322463
```

Fold  3
Performance Training =  0.5583764881960198
Performance Validation =  0.4077023119751655


Fold  4
Performance Training =  0.6555681147954553
Performance Validation =  0.4079694325322777


Average Performance in Training =  0.581366196863429
Average Performance in Validation =  0.5213195415680644
------------------------------------------------------

M Value =  9
Lambda Value =  0.98

Fold  1
Performance Training =  0.5656534570390908
Performance Validation =  0.6224799159516341


Fold  2
Performance Training =  0.5443648264301144
Performance Validation =  0.6452211308856846


Fold  3
Performance Training =  0.5576566167345447
Performance Validation =  0.40640246808916025


Fold  4
Performance Training =  0.6548202691320824
Performance Validation =  0.4075966911614819


Average Performance in Training =  0.5806237923339581
Average Performance in Validation =  0.5204250515219901
------------------------------------------------------

M Value =  9
Lambda Value =  0.99

Fold  1
Performance Training =  0.5648996413739236
Performance Validation =  0.6215917942423391


Fold  2
Performance Training =  0.5436202567357191
Performance Validation =  0.6441970439331335


Fold  3
Performance Training =  0.5569373227561063
Performance Validation =  0.4051073567507316


Fold  4
Performance Training =  0.6540723386070757
Performance Validation =  0.4072236885883658


Average Performance in Training =  0.5798823898682062
Average Performance in Validation =  0.5195299708786425

```
--------------------------------------------------------

M Value =  9
Lambda Value =  1.0

Fold  1
Performance Training =  0.5641478340315524
Performance Validation =  0.6206957611963297

Fold  2
Performance Training =  0.5428772061552642
Performance Validation =  0.6431743844348284

Fold  3
Performance Training =  0.5562186302347569
Performance Validation =  0.4038169526299814

Fold  4
Performance Training =  0.6533243647794782
Performance Validation =  0.406850438389202

Average Performance in Training =  0.579142008800263
Average Performance in Validation =  0.5186343841625853
--------------------------------------------------------

M Value =  9
Lambda Value =  1.01

Fold  1
Performance Training =  0.5633980324841021
Performance Validation =  0.6197921131653723

Fold  2
Performance Training =  0.5421356889941367
Performance Validation =  0.6421531954678357

Fold  3
Performance Training =  0.5555005627750865
Performance Validation =  0.4025312308586535

Fold  4
Performance Training =  0.6525763883229458
Performance Validation =  0.4064769542910107

Average Performance in Training =  0.5784026681440677
Average Performance in Validation =  0.517738373445718
--------------------------------------------------------

M Value =  9
Lambda Value =  1.02

Fold  1
Performance Training =  0.5626502344650157
Performance Validation =  0.618881137684787

Fold  2
```

```
Performance Training =  0.541395719231593
Performance Validation =  0.6411335188516536


Fold  3
Performance Training =  0.5547831436055537
Performance Validation =  0.4012501670034412


Fold  4
Performance Training =  0.6518284490382316
Performance Validation =  0.4061032501434203


Average Performance in Training =  0.5776643865850986
Average Performance in Validation =  0.5168420184208256
------------------------------------------------------

M Value =  9
Lambda Value =  1.03

Fold  1
Performance Training =  0.5619044379394695
Performance Validation =  0.6179631137823635


Fold  2
Performance Training =  0.5406573105148494
Performance Validation =  0.6401153951736518


Fold  3
Performance Training =  0.5540663955728786
Performance Validation =  0.39997373704107864


Fold  4
Performance Training =  0.651080585865843
Performance Validation =  0.4057293398926479


Average Performance in Training =  0.5769271824732602
Average Performance in Validation =  0.5159453964724354
------------------------------------------------------

M Value =  9
Lambda Value =  1.04

Fold  1
Performance Training =  0.5611606410769963
Performance Validation =  0.6170383122735809


Fold  2
Performance Training =  0.5399204761542709
Performance Validation =  0.6390988638143286


Fold  3
Performance Training =  0.5533503411374154
Performance Validation =  0.3987019173350851


Fold  4
Performance Training =  0.6503328368988459
Performance Validation =  0.40535523755744685
```

Average Performance in Training =  0.5761910738168821
Average Performance in Validation =  0.5150485827451103
------------------------------------------------------

M Value =  9
Lambda Value =  1.05

Fold  1
Performance Training =  0.5604188422261583
Performance Validation =  0.616106996043893

Fold  2
Performance Training =  0.5391852291195606
Performance Validation =  0.6380839629723464

Fold  3
Performance Training =  0.5526350023694224
Performance Validation =  0.3974346846140666

Fold  4
Performance Training =  0.6495852393957735
Performance Validation =  0.404980957206885

Average Performance in Training =  0.5754560782777287
Average Performance in Validation =  0.5141516502092978
------------------------------------------------------

M Value =  9
Lambda Value =  1.06

Fold  1
Performance Training =  0.559679039891129
Performance Validation =  0.6151694203187874

Fold  2
Performance Training =  0.5384515820368656
Performance Validation =  0.6370707296893297

Fold  3
Performance Training =  0.5519204009461578
Performance Validation =  0.39617201595144635

Fold  4
Performance Training =  0.6488378297936139
Performance Validation =  0.40460651293982597

Average Performance in Training =  0.5747222131669416
Average Performance in Validation =  0.5132546697248473
------------------------------------------------------

M Value =  9
Lambda Value =  1.07

Fold  1
Performance Training =  0.5589412327100501

```
Performance Validation =  0.6142258329222832


Fold  2
Performance Training =  0.5377195471867173
Performance Validation =  0.6360591998743962


Fold  3
Performance Training =  0.5512065581497321
Performance Validation =  0.394913888746542


Fold  4
Performance Training =  0.6480906437208476
Performance Validation =  0.4042319188659943


Average Performance in Training =  0.5739894954418368
Average Performance in Validation =  0.5123577101023039
------------------------------------------------------


M Value =  9
Lambda Value =  1.08


Fold  1
Performance Training =  0.5582054194350423
Performance Validation =  0.6132764745244905


Fold  2
Performance Training =  0.5369891365027306
Performance Validation =  0.635049408328407


Fold  3
Performance Training =  0.550493494865655
Performance Validation =  0.3936602807068925


Fold  4
Performance Training =  0.6473437160105087
Performance Validation =  0.40385718908851054


Average Performance in Training =  0.5732579417034842
Average Performance in Validation =  0.5114608381620751
------------------------------------------------------


M Value =  9
Lambda Value =  1.09


Fold  1
Performance Training =  0.5574715989137521
Performance Validation =  0.6123215788788061


Fold  2
Performance Training =  0.5362603615709969
Performance Validation =  0.6340413887679164


Fold  3
Performance Training =  0.549781231582019
Performance Validation =  0.3924111698317462
```

```
Fold  4
Performance Training =  0.6465970807132491
Performance Validation =  0.4034823376878044

Average Performance in Training =  0.5725275681950043
Average Performance in Validation =  0.5105641187915683
-------------------------------------------------------

M Value =  10
Lambda Value =  0.01

Fold  1
Performance Training =  0.7108007760539846
Performance Validation =  0.5873818059759841

Fold  2
Performance Training =  0.704843696695225
Performance Validation =  0.7616396858223571

Fold  3
Performance Training =  0.6906664947949153
Performance Validation =  0.6522819192299261

Fold  4
Performance Training =  0.7597548010553068
Performance Validation =  0.542945700258866

Average Performance in Training =  0.7165164421498578
Average Performance in Validation =  0.6360622778217834
-------------------------------------------------------

M Value =  10
Lambda Value =  0.02

Fold  1
Performance Training =  0.6919243906665349
Performance Validation =  0.5153137593278079

Fold  2
Performance Training =  0.6778872014792476
Performance Validation =  0.7576119529625277

Fold  3
Performance Training =  0.6690299458688291
Performance Validation =  0.6211680991569607

Fold  4
Performance Training =  0.744927868666794
Performance Validation =  0.5088654290971903

Average Performance in Training =  0.6959423516703513
Average Performance in Validation =  0.6007398101361217
-------------------------------------------------------

M Value =  10
Lambda Value =  0.03
```

```
Fold  1
Performance Training =  0.6806574368150928
Performance Validation =  0.4856923968075605


Fold  2
Performance Training =  0.6611779974644176
Performance Validation =  0.7523110467378102


Fold  3
Performance Training =  0.6559230916774976
Performance Validation =  0.6021571649137287


Fold  4
Performance Training =  0.7360593945016265
Performance Validation =  0.49005928579878655


Average Performance in Training =  0.6834544801146587
Average Performance in Validation =  0.5825549735644715
--------------------------------------------------

M Value =  10
Lambda Value =  0.04

Fold  1
Performance Training =  0.6730988924489065
Performance Validation =  0.4752192693576097


Fold  2
Performance Training =  0.6500297990648664
Performance Validation =  0.7479642346030793


Fold  3
Performance Training =  0.6472811447685485
Performance Validation =  0.5892879479913051


Fold  4
Performance Training =  0.7302533840520697
Performance Validation =  0.47818989087384334


Average Performance in Training =  0.6751658050835978
Average Performance in Validation =  0.5726653357064593
--------------------------------------------------

M Value =  10
Lambda Value =  0.05

Fold  1
Performance Training =  0.6675564440550863
Performance Validation =  0.47386378393244766


Fold  2
Performance Training =  0.6420740375654308
Performance Validation =  0.7445060412932907


Fold  3
```

```
Performance Training =  0.6411548330800776
Performance Validation =  0.5798481953749932


Fold  4
Performance Training =  0.7261575118183449
Performance Validation =  0.47001671627682307


Average Performance in Training =  0.6692357066297349
Average Performance in Validation =  0.5670586842193887
-------------------------------------------------------


M Value =  10
Lambda Value =  0.06


Fold  1
Performance Training =  0.6632251609113509
Performance Validation =  0.47706021199642357


Fold  2
Performance Training =  0.6360925130919517
Performance Validation =  0.7417044530473484


Fold  3
Performance Training =  0.6365657767670692
Performance Validation =  0.5725000249984216


Fold  4
Performance Training =  0.7230998800016405
Performance Validation =  0.4640405349899329


Average Performance in Training =  0.664745832693003
Average Performance in Validation =  0.5638263062580317
-------------------------------------------------------


M Value =  10
Lambda Value =  0.07


Fold  1
Performance Training =  0.6596800215281065
Performance Validation =  0.4825567379282659


Fold  2
Performance Training =  0.6314087556754531
Performance Validation =  0.7393757158728551


Fold  3
Performance Training =  0.632978691978621
Performance Validation =  0.566517387696136


Fold  4
Performance Training =  0.7207148710130278
Performance Validation =  0.4594754692842672


Average Performance in Training =  0.661195585048802
Average Performance in Validation =  0.561981327695381
-------------------------------------------------------
```

```
M Value =  10
Lambda Value =  0.08

Fold  1
Performance Training =  0.6566767970645044
Performance Validation =  0.48917323049391404

Fold  2
Performance Training =  0.6276202875797994
Performance Validation =  0.7373909113951649

Fold  3
Performance Training =  0.6300783358299082
Performance Validation =  0.5614744857412923

Fold  4
Performance Training =  0.7187878787132885
Performance Validation =  0.45587034155410844

Average Performance in Training =  0.6582908247968752
Average Performance in Validation =  0.5609772422961199
------------------------------------------------------

M Value =  10
Lambda Value =  0.09

Fold  1
Performance Training =  0.6540653288199494
Performance Validation =  0.49626494700494894

Fold  2
Performance Training =  0.6244736758936182
Performance Validation =  0.7356606648467576

Fold  3
Performance Training =  0.6276676938863678
Performance Validation =  0.5571057713053529

Fold  4
Performance Training =  0.717185090434499
Performance Validation =  0.45294767650822587

Average Performance in Training =  0.6558479472586085
Average Performance in Validation =  0.5604947649163213
------------------------------------------------------

M Value =  10
Lambda Value =  0.1

Fold  1
Performance Training =  0.6517480762274257
Performance Validation =  0.5034707840560027

Fold  2
Performance Training =  0.621801772740612
```

Performance Validation =  0.7341221985250885


Fold  3
Performance Training =  0.6256175819234905
Performance Validation =  0.5532372639834466


Fold  4
Performance Training =  0.7158189227379732
Performance Validation =  0.4505273964218346


Average Performance in Training =  0.6537465884073753
Average Performance in Validation =  0.5603394107465931
------------------------------------------------------

M Value =  10
Lambda Value =  0.11


Fold  1
Performance Training =  0.6496587268495465
Performance Validation =  0.5105867785878377


Fold  2
Performance Training =  0.6194900449206098
Performance Validation =  0.7327305537992537


Fold  3
Performance Training =  0.6238398906107958
Performance Validation =  0.5497502945812125


Fold  4
Performance Training =  0.7146297387831262
Performance Validation =  0.4484874780006516


Average Performance in Training =  0.6519046002910196
Average Performance in Validation =  0.5603887762422388
------------------------------------------------------

M Value =  10
Lambda Value =  0.12


Fold  1
Performance Training =  0.6477504403931074
Performance Validation =  0.5174989915791772


Fold  2
Performance Training =  0.6174574667093616
Performance Validation =  0.731452880083781


Fold  3
Performance Training =  0.6222725240262463
Performance Validation =  0.5465611714968663


Fold  4
Performance Training =  0.7135755814048094
Performance Validation =  0.4467422579408037

```
Average Performance in Training =  0.6502640031333812
Average Performance in Validation =  0.560563825275157
-------------------------------------------------------

M Value =  10
Lambda Value =  0.13

Fold  1
Performance Training =  0.6459890381918189
Performance Validation =  0.5241463146519587

Fold  2
Performance Training =  0.615645148669514
Performance Validation =  0.7302647144469468

Fold  3
Performance Training =  0.6208704933105547
Performance Validation =  0.5436091870222156

Fold  4
Performance Training =  0.712626111764061
Performance Validation =  0.44522979678725283

Average Performance in Training =  0.6487826979839871
Average Performance in Validation =  0.5608125032270935
-------------------------------------------------------

M Value =  10
Lambda Value =  0.14

Fold  1
Performance Training =  0.6443488773178566
Performance Validation =  0.5304991278768001

Fold  2
Performance Training =  0.6140092904581127
Performance Validation =  0.7291475224122511

Fold  3
Performance Training =  0.6196004259038517
Performance Validation =  0.5408492356185668

Fold  4
Performance Training =  0.7117588764357579
Performance Validation =  0.4439041759602196

Average Performance in Training =  0.6474293675288947
Average Performance in Validation =  0.5611000154669594
-------------------------------------------------------

M Value =  10
Lambda Value =  0.15

Fold  1
Performance Training =  0.6428102529003568
Performance Validation =  0.536546708236461
```

```
Fold  2
Performance Training =  0.6125166586082245
Performance Validation =  0.728087041678884

Fold  3
Performance Training =  0.6184370575729194
Performance Validation =  0.5382471028966069

Fold  4
Performance Training =  0.7109569240242392
Performance Validation =  0.44273061783725853

Average Performance in Training =  0.646180223276435
Average Performance in Validation =  0.5614028676623026
------------------------------------------------------

M Value =  10
Lambda Value =  0.16

Fold  1
Performance Training =  0.6413577066695374
Performance Validation =  0.5422896371950117

Fold  2
Performance Training =  0.6111415956249752
Performance Validation =  0.7270721446354245

Fold  3
Performance Training =  0.6173609210312753
Performance Validation =  0.5357763634980363

Fold  4
Performance Training =  0.7102072353111957
Performance Validation =  0.4416822907117651

Average Performance in Training =  0.6450168646592458
Average Performance in Validation =  0.5617051090100593
------------------------------------------------------

M Value =  10
Lambda Value =  0.17

Fold  1
Performance Training =  0.6399788923966985
Performance Validation =  0.5477351467703979

Fold  2
Performance Training =  0.6098639889128802
Performance Validation =  0.7260940422204487

Fold  3
Performance Training =  0.6163567814465281
Performance Validation =  0.5334162819802133

Fold  4
```

```
Performance Training =  0.7094996608298537
Performance Validation =  0.4407381563275753


Average Performance in Training =  0.6439248308964901
Average Performance in Validation =  0.5619959068246588
------------------------------------------------------


M Value =  10
Lambda Value =  0.18


Fold  1
Performance Training =  0.6386637944895108
Performance Validation =  0.5528942343217507


Fold  2
Performance Training =  0.6086678590069352
Performance Validation =  0.7251457166435933


Fold  3
Performance Training =  0.6154125521070473
Performance Validation =  0.5311503579793352


Fold  4
Performance Training =  0.7088261845167205
Performance Validation =  0.4398814831228429


Average Performance in Training =  0.6428925975300535
Average Performance in Validation =  0.5622679480168805
------------------------------------------------------


M Value =  10
Lambda Value =  0.19


Fold  1
Performance Training =  0.6374041768993586
Performance Validation =  0.5577798629897649


Fold  2
Performance Training =  0.6075403577619302
Performance Validation =  0.7242215103947529


Fold  3
Performance Training =  0.6145185269247384
Performance Validation =  0.5289652962895119


Fold  4
Performance Training =  0.708180402486114
Performance Validation =  0.43909879641913874


Average Performance in Training =  0.6419108660180353
Average Performance in Validation =  0.5625163665232921
------------------------------------------------------


M Value =  10
Lambda Value =  0.2
```

```
Fold  1
Performance Training =  0.6361931860521903
Performance Validation =  0.5624058391914082

Fold  2
Performance Training =  0.6064710441843009
Performance Validation =  0.7233168238626164

Fold  3
Performance Training =  0.6136668269058583
Performance Validation =  0.5268502638270354

Fold  4
Performance Training =  0.7075571470799809
Performance Validation =  0.43837912248092925

Average Performance in Training =  0.6409720510555825
Average Performance in Validation =  0.5627380123404973
------------------------------------------------------

M Value =  10
Lambda Value =  0.21

Fold  1
Performance Training =  0.6350250591533344
Performance Validation =  0.5667861176416296

Fold  2
Performance Training =  0.6054513521814272
Performance Validation =  0.7224278896764089

Fold  3
Performance Training =  0.6128509941489703
Performance Validation =  0.5247963443874832

Fold  4
Performance Training =  0.7069522110930913
Performance Validation =  0.43771343456020007

Average Performance in Training =  0.6400699041442057
Average Performance in Validation =  0.5629309465664305
------------------------------------------------------

M Value =  10
Lambda Value =  0.22

Fold  1
Performance Training =  0.6338949060902075
Performance Validation =  0.5709343788017014

Fold  2
Performance Training =  0.6044741934399476
Performance Validation =  0.7215516020808572

Fold  3
Performance Training =  0.6120656894778935
```

```
Performance Validation =  0.5227961323647675


Fold  4
Performance Training =  0.7063621423832807
Performance Validation =  0.437094240502803

Average Performance in Training =  0.6391992328478323
Average Performance in Validation =  0.5630940884375323
------------------------------------------------------

M Value =  10
Lambda Value =  0.23

Fold  1
Performance Training =  0.632798543720766
Performance Validation =  0.5748637808941041

Fold  2
Performance Training =  0.6035336570507654
Performance Validation =  0.7206853863515482

Fold  3
Performance Training =  0.6113064641176469
Performance Validation =  0.5208434257774343

Fold  4
Performance Training =  0.7057840887816187
Performance Validation =  0.43651527132817747

Average Performance in Training =  0.6383556884176993
Average Performance in Validation =  0.563226966087816
------------------------------------------------------

M Value =  10
Lambda Value =  0.24

Fold  1
Performance Training =  0.6317323681024616
Performance Validation =  0.5785868239647026

Fold  2
Performance Training =  0.6026247794617402
Performance Validation =  0.71982709772992

Fold  3
Performance Training =  0.6105695850911244
Performance Validation =  0.5189329913711112

Fold  4
Performance Training =  0.7052156795071163
Performance Validation =  0.43597124298881496

Average Performance in Training =  0.6375356030406106
Average Performance in Validation =  0.5633295390136372
------------------------------------------------------
```

```
M Value =  10
Lambda Value =  0.25

Fold  1
Performance Training =  0.6306932546427032
Performance Validation =  0.5821152856461449

Fold  2
Performance Training =  0.6017433662689344
Performance Validation =  0.718974942390582

Fold  3
Performance Training =  0.609851900143678
Performance Validation =  0.5170603827778593

Fold  4
Performance Training =  0.7046549334492335
Performance Validation =  0.43545767194202745

Average Performance in Training =  0.6367358636261372
Average Performance in Validation =  0.5634020706891534
------------------------------------------------------

M Value =  10
Lambda Value =  0.26

Fold  1
Performance Training =  0.6296784791032656
Performance Validation =  0.5854602023838286

Fold  2
Performance Training =  0.6008858527086448
Performance Validation =  0.7181274150418508

Fold  3
Performance Training =  0.6091507321300103
Performance Validation =  0.5152217982412371

Fold  4
Performance Training =  0.704100187481761
Performance Validation =  0.43497073082149296

Average Performance in Training =  0.6359538128559203
Average Performance in Validation =  0.5634450366221023
------------------------------------------------------

M Value =  10
Lambda Value =  0.27

Fold  1
Performance Training =  0.6286856543942945
Performance Validation =  0.5886318789707583

Fold  2
Performance Training =  0.6000491933835488
Performance Validation =  0.7172832492180322
```

```
Fold  3
Performance Training =  0.608463795623269
Performance Validation =  0.5134139682003002


Fold  4
Performance Training =  0.7035500398890355
Performance Validation =  0.4345071343570258


Average Performance in Training =  0.635187170822537
Average Performance in Validation =  0.5634590576865292
------------------------------------------------------


M Value =  10
Lambda Value =  0.28


Fold  1
Performance Training =  0.6277126794757613
Performance Validation =  0.5916399151484832


Fold  2
Performance Training =  0.5992307743130802
Performance Validation =  0.7164413773527436


Fold  3
Performance Training =  0.6077891304703955
Performance Validation =  0.5116340656564877


Fold  4
Performance Training =  0.7030033053186133
Performance Validation =  0.4340640483692956


Average Performance in Training =  0.6344339723944625
Average Performance in Validation =  0.5634448516317525
------------------------------------------------------


M Value =  10
Lambda Value =  0.29


Fold  1
Performance Training =  0.6267576976526053
Performance Validation =  0.5944932419101971


Fold  2
Performance Training =  0.5984283422038605
Performance Validation =  0.7156008984605499


Fold  3
Performance Training =  0.6071250484024999
Performance Validation =  0.509879634102335


Fold  4
Performance Training =  0.7024589786146949
Performance Validation =  0.4336390165511692


Average Performance in Training =  0.6336925167184151
```

Average Performance in Validation =  0.5634031977560627
----------------------------------------------------

M Value =  10
Lambda Value =  0.3

Fold  1
Performance Training =  0.625819062238011
Performance Validation =  0.597200162704628

Fold  2
Performance Training =  0.5976399471279017
Performance Validation =  0.7147610517885338

Fold  3
Performance Training =  0.606470089798093
Performance Validation =  0.5081485291161603

Fold  4
Performance Training =  0.701916205558347
Performance Validation =  0.4332299010920976

Average Performance in Training =  0.6329613261805882
Average Performance in Validation =  0.5633349111753548
----------------------------------------------------

M Value =  10
Lambda Value =  0.31

Fold  1
Performance Training =  0.6248953080549591
Performance Validation =  0.5997683964410002

Fold  2
Performance Training =  0.5968638957317027
Performance Validation =  0.713921195190627

Fold  3
Performance Training =  0.6058229884120648
Performance Validation =  0.5064388706852981

Fold  4
Performance Training =  0.7013742590264
Performance Validation =  0.4328348341732219

Average Performance in Training =  0.6322391128062816
Average Performance in Validation =  0.5632408241225368
----------------------------------------------------

M Value =  10
Lambda Value =  0.32

Fold  1
Performance Training =  0.6239851276076691
Performance Validation =  0.6022051203284646

```
Fold  2
Performance Training =  0.5960987127842953
Performance Validation =  0.7130807872667999


Fold  3
Performance Training =  0.605182642406095
Performance Validation =  0.5047490040213527


Fold  4
Performance Training =  0.7008325194362646
Performance Validation =  0.4324521780706516


Average Performance in Training =  0.631524750558581
Average Performance in Validation =  0.5631217724218172
----------------------------------------------------


M Value =  10
Lambda Value =  0.33

Fold  1
Performance Training =  0.6230873510213342
Performance Validation =  0.6045170113385632


Fold  2
Performance Training =  0.5953431093790802
Performance Validation =  0.7122393725251914


Fold  3
Performance Training =  0.604548090402508
Performance Validation =  0.5030774671491887


Fold  4
Performance Training =  0.7002904586065992
Performance Validation =  0.43208049212860267


Average Performance in Training =  0.6308172523523804
Average Performance in Validation =  0.5629785857853865
----------------------------------------------------


M Value =  10
Lambda Value =  0.34

Fold  1
Performance Training =  0.6222009290475738
Performance Validation =  0.6067102855816704


Fold  2
Performance Training =  0.5945959564829353
Performance Validation =  0.711396568987977


Fold  3
Performance Training =  0.6039184915718288
Performance Validation =  0.5014229639381291


Fold  4
Performance Training =  0.6997476263598513
```

```
Performance Validation =  0.4317185052553082

Average Performance in Training =  0.6301157508655473
Average Performance in Validation =  0.5628120809407712
------------------------------------------------------

M Value =  10
Lambda Value =  0.35000000000000003

Fold  1
Performance Training =  0.6213249185831031
Performance Validation =  0.6087907352206199

Fold  2
Performance Training =  0.5938562628116111
Performance Validation =  0.7105520577854081

Fold  3
Performance Training =  0.6032931089814064
Performance Validation =  0.4997843415353854

Fold  4
Performance Training =  0.6992036393404458
Performance Validation =  0.43136509288922376

Average Performance in Training =  0.6294194824291416
Average Performance in Validation =  0.5626230568576593
------------------------------------------------------

M Value =  10
Lambda Value =  0.36

Fold  1
Performance Training =  0.62045847026339
Performance Validation =  0.6107637627624831

Fold  2
Performance Training =  0.5931231562275828
Performance Validation =  0.7097055743771663

Fold  3
Performance Training =  0.6026712955973985
Performance Validation =  0.4981605713831925

Fold  4
Performance Training =  0.6986581716346821
Performance Validation =  0.43101925760699444

Average Performance in Training =  0.6287277734307634
Average Performance in Validation =  0.5624122915324591
------------------------------------------------------

M Value =  10
Lambda Value =  0.37

Fold  1
```

```
Performance Training =  0.6196008177808692
Performance Validation =  0.6126344127096286


Fold  2
Performance Training =  0.5923958680230414
Performance Validation =  0.7088569011132722


Fold  3
Performance Training =  0.6020524824587328
Performance Validation =  0.49655073317095355


Fold  4
Performance Training =  0.69811094686443
Performance Validation =  0.4306801127162315


Average Performance in Training =  0.6280400287817683
Average Performance in Validation =  0.5621805399275215
----------------------------------------------------


M Value =  10
Lambda Value =  0.38


Fold  1
Performance Training =  0.6187512686453814
Performance Validation =  0.6144074006392206


Fold  2
Performance Training =  0.5916737195793706
Performance Validation =  0.7080058609036227


Fold  3
Performance Training =  0.6014361686391777
Performance Validation =  0.4949540012048702


Fold  4
Performance Training =  0.6975617314931502
Performance Validation =  0.43034686830864755


Average Performance in Training =  0.62735572208927
Average Performance in Validation =  0.5619285327640904
----------------------------------------------------


M Value =  10
Lambda Value =  0.39


Fold  1
Performance Training =  0.6179091961577179
Performance Validation =  0.616087139833047


Fold  2
Performance Training =  0.5909561109945853
Performance Validation =  0.7071523118097274


Fold  3
Performance Training =  0.6008219126894512
Performance Validation =  0.4933696327793585
```

```
Fold  4
Performance Training =  0.6970103291344221
Performance Validation =  0.4300188193522474

Average Performance in Training =  0.6266743872440441
Average Performance in Validation =  0.5616569759435951
----------------------------------------------------

M Value =  10
Lambda Value =  0.4

Fold  1
Performance Training =  0.6170740324090866
Performance Validation =  0.6176777656087238

Fold  2
Performance Training =  0.5902425113486693
Performance Validation =  0.7062961424072565

Fold  3
Performance Training =  0.6002093253106691
Performance Validation =  0.49179695821468894

Fold  4
Performance Training =  0.6964565756936254
Performance Validation =  0.4296953354820171

Average Performance in Training =  0.6259956111905126
Average Performance in Validation =  0.5613665504281715
----------------------------------------------------

M Value =  10
Lambda Value =  0.41000000000000003

Fold  1
Performance Training =  0.6162452621526131
Performance Validation =  0.619183157516925

Fold  2
Performance Training =  0.5895324503386496
Performance Validation =  0.7054372677958306

Fold  3
Performance Training =  0.5995980630571828
Performance Validation =  0.4902353722880183

Fold  4
Performance Training =  0.6959003352053053
Performance Validation =  0.4293758522123208

Average Performance in Training =  0.6253190276884377
Average Performance in Validation =  0.5610579124532737
----------------------------------------------------

M Value =  10
```

```
Lambda Value =  0.42

Fold  1
Performance Training =  0.6154224174195903
Performance Validation =  0.6206069595725974

Fold  2
Performance Training =  0.5888255110643519
Performance Validation =  0.704575626154634

Fold  3
Performance Training =  0.5989878229039738
Performance Validation =  0.48868432683524743

Fold  4
Performance Training =  0.6953414962540426
Performance Validation =  0.4290598633447429

Average Performance in Training =  0.6246443119104896
Average Performance in Validation =  0.5607316939768054
-----------------------------------------------------

M Value =  10
Lambda Value =  0.43

Fold  1
Performance Training =  0.6146050727746137
Performance Validation =  0.6219525986850041

Fold  2
Performance Training =  0.5881213237849872
Performance Validation =  0.7037111757602199

Fold  3
Performance Training =  0.5983783375433243
Performance Validation =  0.48714332434073404

Fold  4
Performance Training =  0.6947799688868228
Performance Validation =  0.42874691438554813

Average Performance in Training =  0.623971175747437
Average Performance in Validation =  0.5603885032928765
-----------------------------------------------------

M Value =  10
Lambda Value =  0.44

Fold  1
Performance Training =  0.6137928411210825
Performance Validation =  0.623223301444318

Fold  2
Performance Training =  0.587419560498206
Performance Validation =  0.7028438923972311
```

Fold 3
Performance Training = 0.5977693712992362
Performance Validation = 0.48561191236416534


Fold 4
Performance Training = 0.6942156819410767
Performance Validation = 0.4284365968193028


Average Performance in Training = 0.6232993637149004
Average Performance in Validation = 0.5600289257562543
-----------------------------------------------------

M Value = 10
Lambda Value = 0.45

Fold 1
Performance Training = 0.6129853699826707
Performance Validation = 0.6244221094130484


Fold 2
Performance Training = 0.5867199302186352
Performance Validation = 0.7019737671043575


Fold 3
Performance Training = 0.5971607165671962
Performance Validation = 0.48408967867950503


Fold 4
Performance Training = 0.693648580725623
Performance Validation = 0.4281285431114319


Average Performance in Training = 0.6226286493735312
Average Performance in Validation = 0.5596535245770857
-----------------------------------------------------

M Value = 10
Lambda Value = 0.46

Fold 1
Performance Training = 0.6121823381979665
Performance Validation = 0.6255518930601434


Fold 2
Performance Training = 0.5860221748535368
Performance Validation = 0.7011008042073417


Fold 3
Performance Training = 0.5965521907023976
Performance Validation = 0.4825762470220427


Fold 4
Performance Training = 0.6930786250023077
Performance Validation = 0.4278224223336795


Average Performance in Training = 0.6219588321890521
Average Performance in Validation = 0.5592628416558019

```
--------------------------------------------------------

M Value =  10
Lambda Value =  0.47000000000000003

Fold  1
Performance Training =  0.6113834529749985
Performance Validation =  0.6266153644645942

Fold  2
Performance Training =  0.5853260655899994
Performance Validation =  0.7002250195985871

Fold  3
Performance Training =  0.5959436332921673
Performance Validation =  0.4810712733565212

Fold  4
Performance Training =  0.6925057872247633
Performance Validation =  0.4275179363238023

Average Performance in Training =  0.6212897347704821
Average Performance in Validation =  0.5588573984358762
--------------------------------------------------------

M Value =  10
Lambda Value =  0.48

Fold  1
Performance Training =  0.6105884472602822
Performance Validation =  0.6276150889046479

Fold  2
Performance Training =  0.5846313997218362
Performance Validation =  0.699346439229291

Fold  3
Performance Training =  0.5953349037586837
Performance Validation =  0.479574442593373

Fold  4
Performance Training =  0.6919300509977397
Performance Validation =  0.4272148163049917

Average Performance in Training =  0.6206212004346354
Average Performance in Validation =  0.5584376967580759
--------------------------------------------------------

M Value =  10
Lambda Value =  0.49

Fold  1
Performance Training =  0.6097970773835837
Performance Validation =  0.6285534954383016

Fold  2
```

```
Performance Training =  0.5839379978556649
Performance Validation =  0.6984650977852838


Fold  3
Performance Training =  0.5947258792465718
Performance Validation =  0.4780854656915391


Fold  4
Performance Training =  0.6913514097262693
Performance Validation =  0.42691281990220575


Average Performance in Training =  0.6199530910530224
Average Performance in Validation =  0.5580042197043326
------------------------------------------------------

M Value =  10
Lambda Value =  0.5

Fold  1
Performance Training =  0.6090091209450987
Performance Validation =  0.6294328865709491


Fold  2
Performance Training =  0.5832457014449886
Performance Validation =  0.697581037522131


Fold  3
Performance Training =  0.59411645275698
Performance Validation =  0.47660407709586294


Fold  4
Performance Training =  0.6907698654286953
Performance Validation =  0.42661172850225415


Average Performance in Training =  0.6192852851439407
Average Performance in Validation =  0.5575574324227992
------------------------------------------------------

M Value =  10
Lambda Value =  0.51

Fold  1
Performance Training =  0.6082243749163521
Performance Validation =  0.6302554470969446


Fold  2
Performance Training =  0.5825543706088352
Performance Validation =  0.6966943072386648


Fold  3
Performance Training =  0.5935065314955565
Performance Validation =  0.4751300324649076


Fold  4
Performance Training =  0.690185427691553
Performance Validation =  0.4263113449124676
```

```
Average Performance in Training =  0.6186176761780742
Average Performance in Validation =  0.5570977829282462
------------------------------------------------------

M Value =  10
Lambda Value =  0.52

Fold  1
Performance Training =  0.6074426539300195
Performance Validation =  0.6310232521933986

Fold  2
Performance Training =  0.5818638821979751
Performance Validation =  0.695804961371159

Fold  3
Performance Training =  0.5928960354065875
Performance Validation =  0.4736631066515984

Fold  4
Performance Training =  0.6895981127475928
Performance Validation =  0.42601149127947646

Average Performance in Training =  0.6179501710705437
Average Performance in Validation =  0.5566257028739081
------------------------------------------------------

M Value =  10
Lambda Value =  0.53

Fold  1
Performance Training =  0.6066637887371651
Performance Validation =  0.6317382748369142

Fold  2
Performance Training =  0.5811741280771145
Performance Validation =  0.6949130591929036

Fold  3
Performance Training =  0.5922848958696
Performance Validation =  0.4722030919045771

Fold  4
Performance Training =  0.6890079426609803
Performance Validation =  0.42571200723519165

Average Performance in Training =  0.6172826888362151
Average Performance in Validation =  0.5561416082923967
------------------------------------------------------

M Value =  10
Lambda Value =  0.54

Fold  1
Performance Training =  0.6058876248131806
```

Performance Validation =  0.6324023926068718

Fold  2
Performance Training =  0.5804850135959831
Performance Validation =  0.6940186641060704

Fold  3
Performance Training =  0.5916730545381242
Performance Validation =  0.47074979626274116

Fold  4
Performance Training =  0.6884149446060128
Performance Validation =  0.42541274824176456

Average Performance in Training =  0.6166151593883252
Average Performance in Validation =  0.555645900304362
------------------------------------------------------

M Value =  10
Lambda Value =  0.55

Fold  1
Performance Training =  0.6051140210961131
Performance Validation =  0.6330173939326538

Fold  2
Performance Training =  0.579796456226049
Performance Validation =  0.6931218430145771

Fold  3
Performance Training =  0.5910604623031648
Performance Validation =  0.46930304211928675

Fold  4
Performance Training =  0.6878191502276241
Performance Validation =  0.425113584111253

Average Performance in Training =  0.6159475224632378
Average Performance in Validation =  0.5551389657944427
------------------------------------------------------

M Value =  10
Lambda Value =  0.56

Fold  1
Performance Training =  0.6043428488430925
Performance Validation =  0.6335849838363861

Fold  2
Performance Training =  0.5791083843427913
Performance Validation =  0.6922226657681804

Fold  3
Performance Training =  0.5904470783663283
Performance Validation =  0.4678626649348758

```
Fold  4
Performance Training =  0.6872205950735981
Performance Validation =  0.42481439767904483

Average Performance in Training =  0.6152797266564525
Average Performance in Validation =  0.5546211780546217
------------------------------------------------------

M Value =  10
Lambda Value =  0.5700000000000001

Fold  1
Performance Training =  0.6035739905923416
Performance Validation =  0.6341067892177256

Fold  2
Performance Training =  0.5784207361361928
Performance Validation =  0.6913212046693367

Fold  3
Performance Training =  0.5898328694096102
Performance Validation =  0.4664285120822691

Fold  4
Performance Training =  0.6866193180897712
Performance Validation =  0.42451508361291956

Average Performance in Training =  0.614611728556979
Average Performance in Validation =  0.5540928973955628
------------------------------------------------------

M Value =  10
Lambda Value =  0.58

Fold  1
Performance Training =  0.6028073392197475
Performance Validation =  0.6345843637224868

Fold  2
Performance Training =  0.5777334586344209
Performance Validation =  0.6904175340354786

Fold  3
Performance Training =  0.5892178088505611
Performance Validation =  0.4650004418071477

Fold  4
Performance Training =  0.6860153611706986
Performance Validation =  0.4242155473420347

Average Performance in Training =  0.613943491968857
Average Performance in Validation =  0.553554471726787
------------------------------------------------------

M Value =  10
Lambda Value =  0.59
```

```
Fold  1
Performance Training =  0.6020427970802886
Performance Validation =  0.635019192232848

Fold  2
Performance Training =  0.5770465068276421
Performance Validation =  0.6895117298102985

Fold  3
Performance Training =  0.5886018761730369
Performance Validation =  0.46357832229183793

Fold  4
Performance Training =  0.6854087687592463
Performance Validation =  0.4239157040921605

Average Performance in Training =  0.6132749872100535
Average Performance in Validation =  0.5530062371067862
----------------------------------------------------

M Value =  10
Lambda Value =  0.6

Fold  1
Performance Training =  0.6012802752257382
Performance Validation =  0.6354126950130812

Fold  2
Performance Training =  0.5763598428805893
Performance Validation =  0.688603869218448

Fold  3
Performance Training =  0.5879850563249969
Performance Validation =  0.4621620308103367

Fold  4
Performance Training =  0.6847995874894236
Performance Validation =  0.42361547801525223

Average Performance in Training =  0.612606190480187
Average Performance in Validation =  0.5524485182642795
----------------------------------------------------

M Value =  10
Lambda Value =  0.61

Fold  1
Performance Training =  0.6005196926910445
Performance Validation =  0.6357662315414356

Fold  2
Performance Training =  0.575673435423956
Performance Validation =  0.6876940304587653

Fold  3
```

```
Performance Training =  0.587367339175 8977
Performance Validation =  0.46075145296456377


Fold  4
Performance Training =  0.6841878658675089
Performance Validation =  0.423314801402944


Average Performance in Training =  0.6119370832896017
Average Performance in Validation =  0.5518816290919272
------------------------------------------------------


M Value =  10
Lambda Value =  0.62


Fold  1
Performance Training =  0.5997609758426508
Performance Validation =  0.6360811040558003


Fold  2
Performance Training =  0.574987258915924
Performance Validation =  0.6867822924317313


Fold  3
Performance Training =  0.5867487190271501
Performance Validation =  0.4593464819929479


Fold  4
Performance Training =  0.6835736539871362
Performance Validation =  0.4230136139748415


Average Performance in Training =  0.6112676519432152
Average Performance in Validation =  0.5513058731138303
------------------------------------------------------


M Value =  10
Lambda Value =  0.63


Fold  1
Performance Training =  0.5990040577827573
Performance Validation =  0.6363585608380804


Fold  2
Performance Training =  0.5743012930662013
Performance Validation =  0.6858687344973906


Fold  3
Performance Training =  0.5861291941699253
Performance Validation =  0.4579470181436217


Fold  4
Performance Training =  0.6829570032745604
Performance Validation =  0.42271186223360624


Average Performance in Training =  0.610597887073361
Average Performance in Validation =  0.5507215439281747
------------------------------------------------------
```

M Value =  10
Lambda Value =  0.64

Fold  1
Performance Training =  0.5982488778041897
Performance Validation =  0.6365997992598283

Fold  2
Performance Training =  0.573615522315876
Performance Validation =  0.6849534362604215

Fold  3
Performance Training =  0.585508766485263
Performance Validation =  0.4565529681053535

Fold  4
Performance Training =  0.6823379662607751
Performance Validation =  0.4224094988797892

Average Performance in Training =  0.609927783216526
Average Performance in Validation =  0.5501289256263481
------------------------------------------------------

M Value =  10
Lambda Value =  0.65

Fold  1
Performance Training =  0.5974953808911042
Performance Validation =  0.6368059686094909

Fold  2
Performance Training =  0.5729299353671803
Performance Validation =  0.684036477379417

Fold  3
Performance Training =  0.5848874410820604
Performance Validation =  0.4551642444902446

Fold  4
Performance Training =  0.6817165963775669
Performance Validation =  0.4221064822801992

Average Performance in Training =  0.6092573384294779
Average Performance in Validation =  0.549528293189838
------------------------------------------------------

M Value =  10
Lambda Value =  0.66

Fold  1
Performance Training =  0.5967435172612711
Performance Validation =  0.6369781727197005

Fold  2
Performance Training =  0.5722445247579618

```
Performance Validation =  0.6831179373977988


Fold  3
Performance Training =  0.5842652259690133
Performance Validation =  0.4537807653628305


Fold  4
Performance Training =  0.6810929477749265
Performance Validation =  0.4218027759843268


Average Performance in Training =  0.6085865539407932
Average Performance in Validation =  0.5489199128661642
-----------------------------------------------------

M Value =  10
Lambda Value =  0.67

Fold  1
Performance Training =  0.5959932419461178
Performance Validation =  0.637117472411314


Fold  2
Performance Training =  0.5715592864762596
Performance Validation =  0.682197895594074


Fold  3
Performance Training =  0.5836421317570565
Performance Validation =  0.4524024538109451


Fold  4
Performance Training =  0.6804670751575578
Performance Validation =  0.42149834828396127


Average Performance in Training =  0.607915433834248
Average Performance in Validation =  0.5483040425250736
-----------------------------------------------------

M Value =  10
Lambda Value =  0.68

Fold  1
Performance Training =  0.5952445144051111
Performance Validation =  0.6372248877693188


Fold  2
Performance Training =  0.5708742196109062
Performance Validation =  0.6812764308493968


Fold  3
Performance Training =  0.5830181713892237
Performance Validation =  0.4510292375541144


Fold  4
Performance Training =  0.6798390336384688
Performance Validation =  0.4211931718170346
```

```
Average Performance in Training =  0.6072439847609274
Average Performance in Validation =  0.5476809319961333
-------------------------------------------------------

M Value =  10
Lambda Value =  0.6900000000000001

Fold  1
Performance Training =  0.5944972981713977
Performance Validation =  0.6373014002643319

Fold  2
Performance Training =  0.5701893260345375
Performance Validation =  0.6803536215306397

Fold  3
Performance Training =  0.5823933598952125
Performance Validation =  0.449661048585848

Fold  4
Performance Training =  0.6792088786078762
Performance Validation =  0.4208872231745442

Average Performance in Training =  0.6065722156772559
Average Performance in Validation =  0.5470508233888409
-------------------------------------------------------

M Value =  10
Lambda Value =  0.7000000000000001

Fold  1
Performance Training =  0.5937515605259388
Performance Validation =  0.6373479547321677

Fold  2
Performance Training =  0.569504610115797
Performance Validation =  0.6794295453873662

Fold  3
Performance Training =  0.5817677141682189
Performance Validation =  0.44829782284649655

Fold  4
Performance Training =  0.6785766656158393
Performance Validation =  0.4205804826191102

Average Performance in Training =  0.6059001376064486
Average Performance in Validation =  0.5464139513962851
-------------------------------------------------------

M Value =  10
Lambda Value =  0.71

Fold  1
Performance Training =  0.5930072721976409
Performance Validation =  0.6373654612227736
```

Fold  2
Performance Training =  0.5688200784578687
Performance Validation =  0.6785042794612763


Fold  3
Performance Training =  0.5811412527618909
Performance Validation =  0.4469394999237457


Fold  4
Performance Training =  0.6779424502672361
Performance Validation =  0.42027293372554286


Average Performance in Training =  0.6052277634211591
Average Performance in Validation =  0.5457705435833347
----------------------------------------------------


M Value =  10
Lambda Value =  0.72


Fold  1
Performance Training =  0.5922644070872342
Performance Validation =  0.6373547967288771


Fold  2
Performance Training =  0.568135739660786
Performance Validation =  0.6775779000068523


Fold  3
Performance Training =  0.5805139957054661
Performance Validation =  0.4455860227781637


Fold  4
Performance Training =  0.67730628812782
Performance Validation =  0.41996456312729913


Average Performance in Training =  0.6045551076453266
Average Performance in Validation =  0.5451208206602981
----------------------------------------------------


M Value =  10
Lambda Value =  0.73


Fold  1
Performance Training =  0.5915229420128605
Performance Validation =  0.6373168068036925


Fold  2
Performance Training =  0.5674516041052373
Performance Validation =  0.6766504824220632


Fold  3
Performance Training =  0.5798859643353778
Performance Validation =  0.4442373374914286


Fold  4

```
Performance Training =  0.6766682346402622
Performance Validation =  0.41965536025445893

Average Performance in Training =  0.6038821862734345
Average Performance in Validation =  0.5444649967429108
----------------------------------------------------

M Value =  10
Lambda Value =  0.74

Fold  1
Performance Training =  0.5907828564755336
Performance Validation =  0.6372523070762517

Fold  2
Performance Training =  0.5667676837558278
Performance Validation =  0.6757221011881135

Fold  3
Performance Training =  0.5792571811417804
Performance Validation =  0.44289339303514674

Fold  4
Performance Training =  0.6760283450491804
Performance Validation =  0.41934531709836353

Average Performance in Training =  0.6032090166055806
Average Performance in Validation =  0.5438032795994688
----------------------------------------------------

M Value =  10
Lambda Value =  0.75

Fold  1
Performance Training =  0.5900441324427999
Performance Validation =  0.6371620846721688

Fold  2
Performance Training =  0.5660839919819676
Performance Validation =  0.6747928298173214

Fold  3
Performance Training =  0.5786276696286168
Performance Validation =  0.4415541410584174

Fold  4
Performance Training =  0.6753866743342701
Performance Validation =  0.41903442799564505

Average Performance in Training =  0.6025356170969136
Average Performance in Validation =  0.5431358708858882
----------------------------------------------------

M Value =  10
Lambda Value =  0.76
```

Fold  1
Performance Training =  0.5893067541490886
Performance Validation =  0.6370468995469394

Fold  2
Performance Training =  0.5654005433947494
Performance Validation =  0.673862740808309

Fold  3
Performance Training =  0.5779974541859804
Performance Validation =  0.44021953569239636

Fold  4
Performance Training =  0.6747432771507504
Performance Validation =  0.41872268942989554

Average Performance in Training =  0.6018620072201422
Average Performance in Validation =  0.5424629663693851
------------------------------------------------------

M Value =  10
Lambda Value =  0.77

Fold  1
Performance Training =  0.5885707079113784
Performance Validation =  0.6369074857383058

Fold  2
Performance Training =  0.5647173536983463
Performance Validation =  0.6729319056077764

Fold  3
Performance Training =  0.5773665599736647
Performance Validation =  0.4388895333704176

Fold  4
Performance Training =  0.6740982077764077
Performance Validation =  0.41841009984940325

Average Performance in Training =  0.6011882073399493
Average Performance in Validation =  0.5417847561414757
------------------------------------------------------

M Value =  10
Lambda Value =  0.78

Fold  1
Performance Training =  0.5878359819589287
Performance Validation =  0.6367445525436276

Fold  2
Performance Training =  0.5640344395545936
Performance Validation =  0.6720003945781896

Fold  3
Performance Training =  0.576735012814882

```
Performance Validation =  0.4375640926622336


Fold  4
Performance Training =  0.6734515200646071
Performance Validation =  0.41809665949954766


Average Performance in Training =  0.6005142385982529
Average Performance in Validation =  0.5411014248208996
-----------------------------------------------------

M Value =  10
Lambda Value =  0.79

Fold  1
Performance Training =  0.5871025662759384
Performance Validation =  0.6365587856277208


Fold  2
Performance Training =  0.5633518184595776
Performance Validation =  0.6710682769708011


Fold  3
Performance Training =  0.5761028390992626
Performance Validation =  0.43624317412120817


Fold  4
Performance Training =  0.6728032674026936
Performance Validation =  0.4177823702685626


Average Performance in Training =  0.599840122809368
Average Performance in Validation =  0.5404131517470732
-----------------------------------------------------

M Value =  10
Lambda Value =  0.8

Fold  1
Performance Training =  0.5863704524560991
Performance Validation =  0.6363508480661515


Fold  2
Performance Training =  0.5626695086311411
Performance Validation =  0.6701356209034637


Fold  3
Performance Training =  0.5754700656942967
Performance Validation =  0.43492674014329014


Fold  4
Performance Training =  0.6721535026752756
Performance Validation =  0.417467235545528


Average Performance in Training =  0.5991658823642032
Average Performance in Validation =  0.5397201111646084
-----------------------------------------------------
```

```
M Value =  10
Lambda Value =  0.81

Fold  1
Performance Training =  0.585639633568094
Performance Validation =  0.6361213813285782

Fold  2
Performance Training =  0.5619875289063452
Performance Validation =  0.6692024933427556

Fold  3
Performance Training =  0.5748367198644981
Performance Validation =  0.4336147548368141

Fold  4
Performance Training =  0.6715022782319195
Performance Validation =  0.4171512600895354

Average Performance in Training =  0.5984915401427142
Average Performance in Validation =  0.5390224723994208
------------------------------------------------------

M Value =  10
Lambda Value =  0.8200000000000001

Fold  1
Performance Training =  0.5849101040311813
Performance Validation =  0.6358710062063364

Fold  2
Performance Training =  0.5613058986480026
Performance Validation =  0.6682689600899854

Fold  3
Performance Training =  0.5742028291976099
Performance Validation =  0.43230718390217815

Fold  4
Performance Training =  0.6708496458588441
Performance Validation =  0.4168344499090917

Average Performance in Training =  0.5978171194339095
Average Performance in Validation =  0.538320400026898
------------------------------------------------------

M Value =  10
Lambda Value =  0.8300000000000001

Fold  1
Performance Training =  0.5841818595000743
Performance Validation =  0.6356003236881527

Fold  2
Performance Training =  0.5606246376594924
Performance Validation =  0.6673350857706877
```

Fold  3
Performance Training =  0.573568421537251
Performance Validation =  0.4310039945206109

Fold  4
Performance Training =  0.6701956567542353
Performance Validation =  0.4165168121508994

Average Performance in Training =  0.5971426438627633
Average Performance in Validation =  0.5376140540325877
------------------------------------------------------

M Value =  10
Lambda Value =  0.84

Fold  1
Performance Training =  0.5834548967583965
Performance Validation =  0.635309915787525

Fold  2
Performance Training =  0.5599437661071338
Performance Validation =  0.66640093382725

Fold  3
Performance Training =  0.5729335249214509
Performance Validation =  0.4297051552512433

Fold  4
Performance Training =  0.6695403615068425
Performance Validation =  0.41619835499723945

Average Performance in Training =  0.5964681373234559
Average Performance in Validation =  0.5369035899658143
------------------------------------------------------

M Value =  10
Lambda Value =  0.85

Fold  1
Performance Training =  0.5827292136200484
Performance Validation =  0.6350003463250529

Fold  2
Performance Training =  0.5592633044494708
Performance Validation =  0.6654665665143566

Fold  3
Performance Training =  0.572298167526578
Performance Validation =  0.42841063593582185

Fold  4
Performance Training =  0.6688838100775474
Performance Validation =  0.4158790875712489

Average Performance in Training =  0.5957936239184112

```
Average Performance in Validation =  0.53618915908662
-----------------------------------------------------


M Value =  10
Lambda Value =  0.86

Fold  1
Performance Training =  0.5820048088378862
Performance Validation =  0.6346721616687325

Fold  2
Performance Training =  0.5585832733728684
Performance Validation =  0.66453204489696

Fold  3
Performance Training =  0.5716623776162069
Performance Validation =  0.4271204076104619

Fold  4
Performance Training =  0.6682260517836281
Performance Validation =  0.41555901984945376

Average Performance in Training =  0.5951191279026474
Average Performance in Validation =  0.535470908506402
-----------------------------------------------------


M Value =  10
Lambda Value =  0.87

Fold  1
Performance Training =  0.5812816820191533
Performance Validation =  0.6343258914349978

Fold  2
Performance Training =  0.5579036937328927
Performance Validation =  0.6635974288505131

Fold  3
Performance Training =  0.5710261834945072
Performance Validation =  0.4258344424238427

Fold  4
Performance Training =  0.6675671352854678
Performance Validation =  0.41523816258096957

Average Performance in Training =  0.5944446736330052
Average Performance in Validation =  0.5347489813225808
-----------------------------------------------------


M Value =  10
Lambda Value =  0.88

Fold  1
Performance Training =  0.5805598335471578
Performance Validation =  0.6339620491530751
```

```
Fold  2
Performance Training =  0.5572245865009741
Performance Validation =  0.6626627770632328

Fold  3
Performance Training =  0.5703896134637891
Performance Validation =  0.4245527135613568

Fold  4
Performance Training =  0.6669071085754767
Performance Validation =  0.41491652721284145

Average Performance in Training =  0.5937702855218494
Average Performance in Validation =  0.5340235167476266
----------------------------------------------------

M Value =  10
Lambda Value =  0.89

Fold  1
Performance Training =  0.5798392645087245
Performance Validation =  0.633581132895022

Fold  2
Performance Training =  0.5565459727159193
Performance Validation =  0.6617281470401786

Fold  3
Performance Training =  0.5697526957858539
Performance Validation =  0.4232751951747472

Fold  4
Performance Training =  0.6662460189690222
Performance Validation =  0.4145941258210326

Average Performance in Training =  0.59309598799488
Average Performance in Validation =  0.5332946502327451
----------------------------------------------------

M Value =  10
Lambda Value =  0.9

Fold  1
Performance Training =  0.5791199766269961
Performance Validation =  0.6331836258736396

Fold  2
Performance Training =  0.555867873439857
Performance Validation =  0.6607935951089439

Fold  3
Performance Training =  0.569115458646839
Performance Validation =  0.4220018623167795

Fold  4
Performance Training =  0.6655839130971801
```

Performance Validation =  0.41427097104662125

Average Performance in Training =  0.592421805452718
Average Performance in Validation =  0.532562513586496
------------------------------------------------------

M Value =  10
Lambda Value =  0.91

Fold  1
Performance Training =  0.5784019721991852
Performance Validation =  0.6327699970102946

Fold  2
Performance Training =  0.555190309718253
Performance Validation =  0.659859176426796

Fold  3
Performance Training =  0.5684779301252789
Performance Validation =  0.4207326908805954

Fold  4
Performance Training =  0.6649208369011332
Performance Validation =  0.4139470760367997

Average Performance in Training =  0.5917477622359626
Average Performance in Validation =  0.5318272350886215
------------------------------------------------------

M Value =  10
Lambda Value =  0.92

Fold  1
Performance Training =  0.5776852540389114
Performance Validation =  0.6323407014745204

Fold  2
Performance Training =  0.5545133025436582
Performance Validation =  0.6589249449890993

Fold  3
Performance Training =  0.5678401381631133
Performance Validation =  0.4194676575433526

Fold  4
Performance Training =  0.6642568356280631
Performance Validation =  0.4136224543903031

Average Performance in Training =  0.5910738825934365
Average Performance in Validation =  0.5310889395993188
------------------------------------------------------

M Value =  10
Lambda Value =  0.93

Fold  1

```
Performance Training =  0.5769698254227917
Performance Validation =  0.6318961811971462


Fold  2
Performance Training =  0.553836872822874
Performance Validation =  0.6579909536388691


Fold  3
Performance Training =  0.5672021105394089
Performance Validation =  0.4182067397138599


Fold  4
Performance Training =  0.6635919538283976
Performance Validation =  0.41329712010693087


Average Performance in Training =  0.590400190653368
Average Performance in Validation =  0.5303477486642014
---------------------------------------------------

M Value =  10
Lambda Value =  0.9400000000000001

Fold  1
Performance Training =  0.5762556900409712
Performance Validation =  0.6314368653585558


Fold  2
Performance Training =  0.5531610413472621
Performance Validation =  0.6570572540773416


Fold  3
Performance Training =  0.5665638748465753
Performance Validation =  0.4169499154838736


Fold  4
Performance Training =  0.6629262353542783
Performance Validation =  0.41297108754084466


Average Performance in Training =  0.5897267103972718
Average Performance in Validation =  0.5296037806151539
---------------------------------------------------

M Value =  10
Lambda Value =  0.9500000000000001

Fold  1
Performance Training =  0.575542851951311
Performance Validation =  0.6309631708535911


Fold  2
Performance Training =  0.5524858287659358
Performance Validation =  0.6561238968754238


Fold  3
Performance Training =  0.5659254584688762
Performance Validation =  0.4156971635828024
```

```
Fold  4
Performance Training =  0.6622597233591373
Performance Validation =  0.4126443713573643

Average Performance in Training =  0.5890534656363151
Average Performance in Validation =  0.5288571506672954
--------------------------------------------------

M Value =  10
Lambda Value =  0.96

Fold  1
Performance Training =  0.5748313155369693
Performance Validation =  0.6304755027344843

Fold  2
Performance Training =  0.5518112555615966
Performance Validation =  0.6551909314859219

Fold  3
Performance Training =  0.565286888563052
Performance Validation =  0.4144484633355753

Fold  4
Performance Training =  0.6615924602982725
Performance Validation =  0.41231698649299153

Average Performance in Training =  0.5883804799899726
Average Performance in Validation =  0.5281079710122433
--------------------------------------------------

M Value =  10
Lambda Value =  0.97

Fold  1
Performance Training =  0.5741210854671304
Performance Validation =  0.6299742546331026

Fold  2
Performance Training =  0.5511373420288042
Performance Validation =  0.6542584062564549

Fold  3
Performance Training =  0.5646481920408841
Performance Validation =  0.4132037946234003

Fold  4
Performance Training =  0.6609244879303282
Performance Validation =  0.41198894811842746

Average Performance in Training =  0.5877077768667867
Average Performance in Validation =  0.5273563509078463
--------------------------------------------------

M Value =  10
```

Lambda Value =  0.98

Fold  1
Performance Training =  0.5734121666606613
Performance Validation =  0.6294598091637327

Fold  2
Performance Training =  0.5504641082544772
Performance Validation =  0.6533263684429502

Fold  3
Performance Training =  0.5640093955535528
Performance Validation =  0.4119631378472549

Fold  4
Performance Training =  0.6602558473195859
Performance Validation =  0.4116602716043578

Average Performance in Training =  0.5870353794470693
Average Performance in Validation =  0.5266023967645739
------------------------------------------------------

M Value =  10
Lambda Value =  0.99

Fold  1
Performance Training =  0.5727045642524815
Performance Validation =  0.6289325383075006

Fold  2
Performance Training =  0.5497915741004467
Performance Validation =  0.6523948642236574

Fold  3
Performance Training =  0.5633705254776372
Performance Validation =  0.4107264738938653

Fold  4
Performance Training =  0.659586578838993
Performance Validation =  0.41133097248980566

Average Performance in Training =  0.5863633106673896
Average Performance in Validation =  0.5258462122287072
------------------------------------------------------

M Value =  10
Lambda Value =  1.0

Fold  1
Performance Training =  0.5719982835624617
Performance Validation =  0.628392803779495

Fold  2
Performance Training =  0.5491197591878934
Performance Validation =  0.6514639387135888

```
Fold  3
Performance Training =  0.5627316079026382
Performance Validation =  0.4094937841040295


Fold  4
Performance Training =  0.6589167221738468
Performance Validation =  0.41100106645285894


Average Performance in Training =  0.5856915932067099
Average Performance in Validation =  0.525087898262493
-----------------------------------------------------

M Value =  10
Lambda Value =  1.01

Fold  1
Performance Training =  0.571293330066663
Performance Validation =  0.6278409573795473


Fold  2
Performance Training =  0.5484486828835161
Performance Validation =  0.6505336359793352


Fold  3
Performance Training =  0.5620926686198939
Performance Validation =  0.40826505024308124


Fold  4
Performance Training =  0.6582463163260726
Performance Validation =  0.4106705692836069


Average Performance in Training =  0.5850202494740364
Average Performance in Validation =  0.5243275532213927
-----------------------------------------------------

M Value =  10
Lambda Value =  1.02

Fold  1
Performance Training =  0.5705897093707628
Performance Validation =  0.6272773413275899


Fold  2
Performance Training =  0.547778364287294
Performance Validation =  0.6496039990541866


Fold  3
Performance Training =  0.5614537331127869
Performance Validation =  0.4070402544733823


Fold  4
Performance Training =  0.6575753996190317
Performance Validation =  0.4103394968591181


Average Performance in Training =  0.5843493015974688
Average Performance in Validation =  0.5235652729285691
```

--------------------------------------------------------

M Value =  10
Lambda Value =  1.03

Fold  1
Performance Training =  0.5698874271855059
Performance Validation =  0.6267022885844409

Fold  2
Performance Training =  0.5471088222217066
Performance Validation =  0.6486750699535049

Fold  3
Performance Training =  0.5608148265481342
Performance Validation =  0.4058193793286635

Fold  4
Performance Training =  0.6569040097028018
Performance Validation =  0.4100078651203203

Average Performance in Training =  0.5836787714145371
Average Performance in Validation =  0.5228011507467324
--------------------------------------------------------

M Value =  10
Lambda Value =  1.04

Fold  1
Performance Training =  0.5691864893040426
Performance Validation =  0.6261161231588

Fold  2
Performance Training =  0.5464400752223012
Performance Validation =  0.6477468896903016

Fold  3
Performance Training =  0.5601759737686713
Performance Validation =  0.404602407690113

Fold  4
Performance Training =  0.6562321835598828
Performance Validation =  0.4096756900506402

Average Performance in Training =  0.5830086804637244
Average Performance in Validation =  0.5220352776474637
--------------------------------------------------------

M Value =  10
Lambda Value =  1.05

Fold  1
Performance Training =  0.5684869015810228
Performance Validation =  0.6255191604012056

Fold  2

```
Performance Training =  0.5457721415294917
Performance Validation =  0.646819498290973


Fold  3
Performance Training =  0.5595371992865421
Performance Validation =  0.4033893227640648


Fold  4
Performance Training =  0.655559957511274
Performance Validation =  0.40934298765628274


Average Performance in Training =  0.5823390499770826
Average Performance in Validation =  0.5212677422781316
------------------------------------------------------


M Value =  10
Lambda Value =  1.06


Fold  1
Performance Training =  0.5677886699133223
Performance Validation =  0.6249117072856433


Fold  2
Performance Training =  0.5451050390814913
Performance Validation =  0.64589293481115


Fold  3
Performance Training =  0.5588985272777138
Performance Validation =  0.40218010806119764


Fold  4
Performance Training =  0.6548873672228881
Performance Validation =  0.4090097739480286


Average Performance in Training =  0.581669900873854
Average Performance in Validation =  0.5204986310265048
------------------------------------------------------


M Value =  10
Lambda Value =  1.07


Fold  1
Performance Training =  0.5670918002222898
Performance Validation =  0.6242940626794566


Fold  2
Performance Training =  0.5444387855082868
Performance Validation =  0.6449672373516302


Fold  3
Performance Training =  0.5582599815772488
Performance Validation =  0.40097474737712957


Fold  4
Performance Training =  0.6542144477122531
Performance Validation =  0.4086760649244474
```

```
Average Performance in Training =  0.5810012537550197
Average Performance in Validation =  0.519728028083166
_____


M Value =  10
Lambda Value =  1.08

Fold  1
Performance Training =  0.5663962984374071
Performance Validation =  0.6236665176021652

Fold  2
Performance Training =  0.543773398126567
Performance Validation =  0.6440424430743545

Fold  3
Performance Training =  0.5576215856753574
Performance Validation =  0.3997732247743132

Fold  4
Performance Training =  0.6535412333554773
Performance Validation =  0.40834187655642395

Average Performance in Training =  0.5803331288987021
Average Performance in Validation =  0.5189560155018142
_____


M Value =  10
Lambda Value =  1.09

Fold  1
Performance Training =  0.5657021704812673
Performance Validation =  0.6230293554737706

Fold  2
Performance Training =  0.5431088939355284
Performance Validation =  0.6431185882184003

Fold  3
Performance Training =  0.5569833627141765
Performance Validation =  0.39857552456513945

Fold  4
Performance Training =  0.6528677578944333
Performance Validation =  0.40800722477290785

Average Performance in Training =  0.5796655462563514
Average Performance in Validation =  0.5181826732575545
_____
```

In [32]: 
```python
plt.figure(figsize=(15,10))
plt.imshow(avg_valid);
plt.colorbar();
```
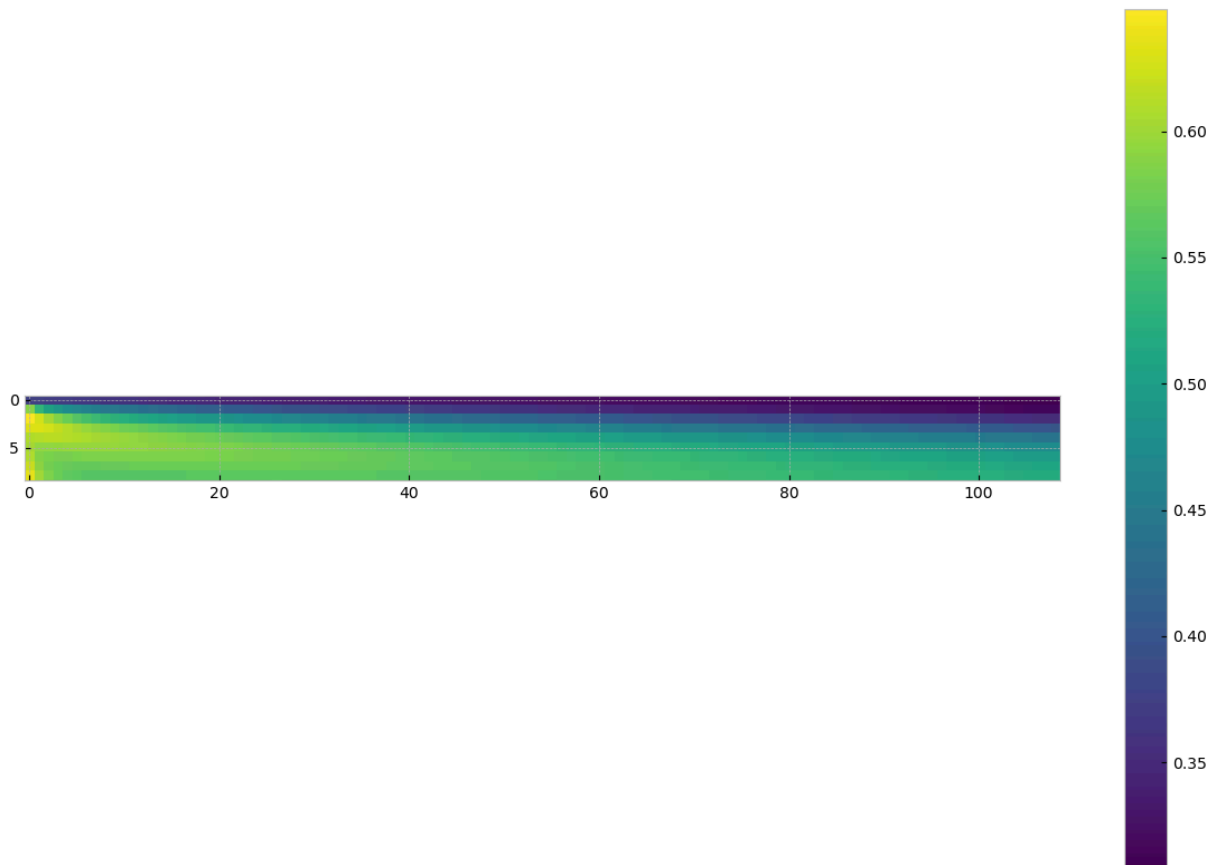
```
##################

# Note that we should be looking for the minimum MSE (not the maximum!)

best_m_val, best_lam_val = np.where(avg_valid==np.max(avg_valid))

print('Best M value = ', M_vals[best_m_val])
print('Best lambda value = ', lam_vals[best_lam_val])
```
```
Best M value =  [4]
Best lambda value =  [0.01]
```

## Refit the Model

Once the optimal hyperaparameters have been identified, the final model is trained using **all of the training data** (including the samples previously used for validation).

```
w, y_train = PolynomialRegression_reg(x_train, t_train, M_vals[best_m_val][0
y_test = PolynomialRegression_test(x_test, w)

fig=plt.figure(figsize=(10,5))
plt.scatter(x_train,t_train, label='Training Data')
plt.scatter(x_test,t_test, c='r', marker='^', label='Test Data')
plt.plot(x_train,y_train,'--r', label = 'Polynomial Regression')
plt.plot(x_true,t_true,'g', label = 'True Function')
plt.legend(bbox_to_anchor=(1.5, 1),fontsize=12,ncol=1)
```

```
plt.xlabel('Data Samples, $x$', fontsize=20)
plt.ylabel('Desired Labels, $t$', fontsize=20);
```
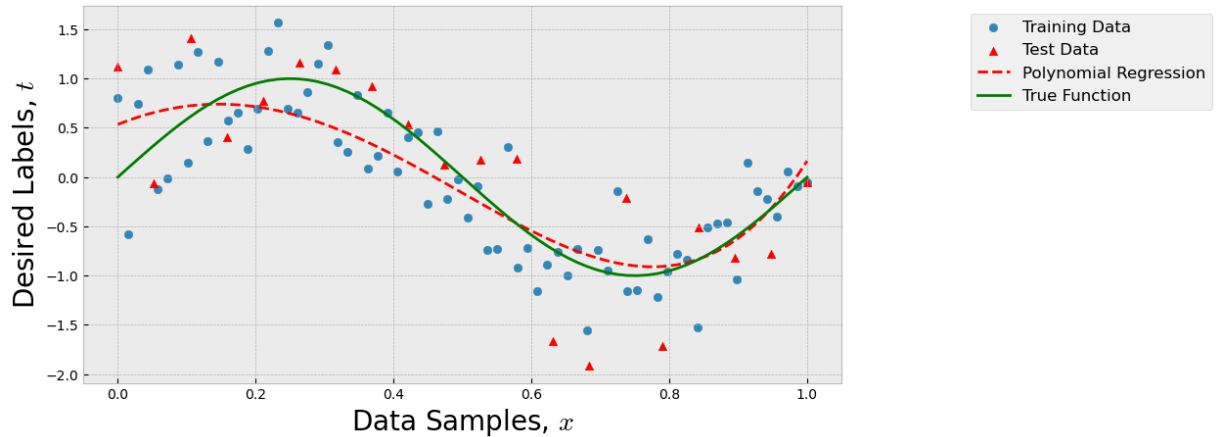


In [36]:
```
print('Training r2-score:', r2_score(t_train, y_train))
print('Test r2-score:', r2_score(t_test, y_test))

x_train.shape, x_test.shape
```

```
Training r2-score: 0.7072627327755109
Test r2-score: 0.6245592992253381
```

Out[36]: `((70,), (20,))`

## Discussion

- We select the set of hyperparameters $\{M, \lambda\}$ with the best performance score (e.g. smallest MSE or largest $r^2$).

- If the value of the hyperparameter falls at the edge of provided range of values, it is appropriate to expand the range of values for further exploration.

- Other performance measures can be used, for example, the coefficient of determination of the Q-Q plot for regression tasks, or accuracy score for classification tasks.

---

# Leave-One-Out Cross-Validation

One extreme case of cross-validation is the **leave-one-out** where given a dataset of $N$ instances, only one instance is left out as the validation set (instance) and training uses the $N-1$ instances. We then get $N$ separate pairs by leaving out a different instance at each iteration. This is typically used in applications such as medical diagnosis, where labeled data is hard to find. Leave-one-out **does not permit stratification**.

---

# The Curse of Dimensionality

The Curse of Dimensionality illustrates various phenomena that arise when we work with high-dimensional data spaces that would not otherwise occur in lower-dimensional settings (such as the 3-dimensional space).

> ## Our intuitions do not hold in high-dimensional spaces 🤔

Let's illustrate this with two examples.

## Example 1: Volume of a Crust

Consider two embedded spheres, $S_1$ and $S_2$, where sphere $S_1$ has radius $r$, sphere $S_2$ has radius $r - \epsilon$, with $0 < \epsilon < r$.

Let's calculate the ratio between the volume of the crust and the volume of the outer sphere $S_1$:

$$\text{ratio} = \frac{V_{crust}}{V_{S_1}} = \frac{V_{S_1} - V_{S_2}}{V_{S_1}}$$

- The $D$-dimensional volume of a sphere of radius $r$ in $D$-dimensional space is:
  $V = \frac{r^D \pi^{\frac{D}{2}}}{\Gamma\left(\frac{D}{2}+1\right)}$, then

$$
\begin{aligned}
\text{ratio} &= \frac{V_{S_1} - V_{S_2}}{V_{S_1}} \\[2mm]
&= 1 - \frac{V_{S_2}}{V_{S_1}} \\[2mm]
&= 1 - \frac{\frac{(r-\epsilon)^D \pi^{\frac{D}{2}}}{\Gamma\left(\frac{D}{2}+1\right)}}{\frac{r^D \pi^{\frac{D}{2}}}{\Gamma\left(\frac{D}{2}+1\right)}} \\[2mm]
&= 1 - \frac{(r-\epsilon)^D}{r^D} \\[2mm]
&= 1 - \frac{r^D \left(1 - \frac{\epsilon}{r}\right)^D}{r^D} \\[2mm]
&= 1 - \left(1 - \frac{\epsilon}{r}\right)^D
\end{aligned}
$$

- For a fixed value for $\epsilon$, a fixed radius $r$ and $\epsilon < r$, what happens as $D$ increases?

```
In [ ]:  # Crust volume between spheres with epsilon different radii and increasing d

         r = 1 # radius of outer sphere
         eps = 0.001 # epsilon value
         D = range(1,10000) # dimensionality
         RatioVol = [1-(1-eps/r)**d for d in D] # ratio of the volume as a function o
         plt.plot(D, RatioVol) # plotting results
         plt.ylabel('ratio$=1 - (1 - \epsilon/r)^D$',size=15)
         plt.xlabel('(Feature Space) Dimensionality, D',size=15);
```

🤯 Let's see another example!

## Example 2: Unit Porcupine

Consider the unit porcupine which is represented as a unit hypersphere inscribed within a unit hypercube.
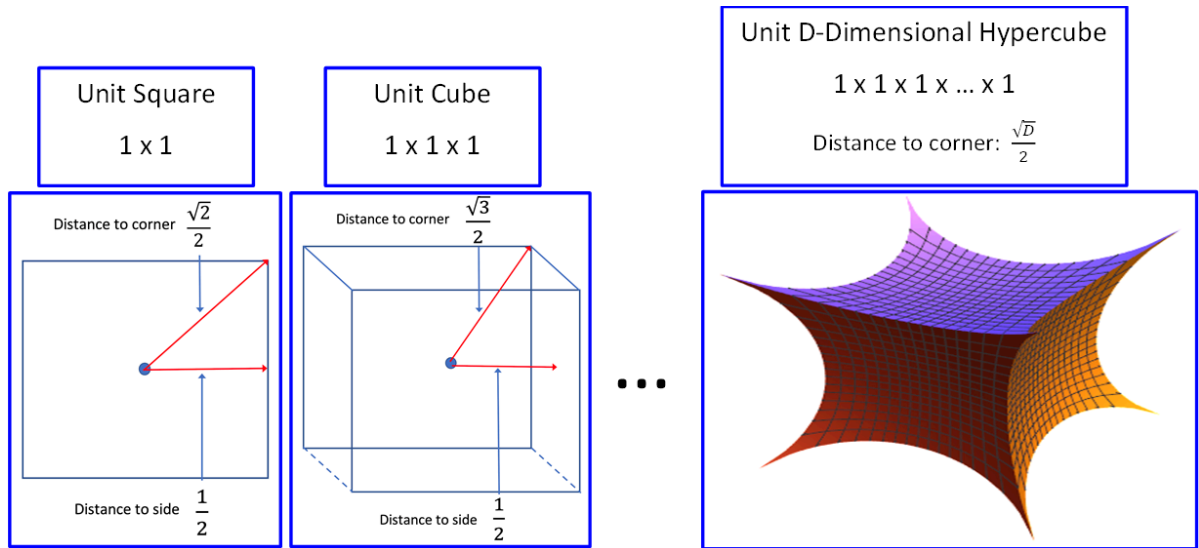
Recall that the $D$-dimensional volume of a $D$-dimensional cube with radius $r$ is $(2r)^D$.

- What happens to the ratio between the volume of the sphere and the volume of the cube as dimensionality $D$ increases?

$$\frac{V(\text{sphere})}{V(\text{cube})} = \frac{\dfrac{r^D \pi^{\frac{D}{2}}}{\Gamma\left(\frac{D}{2}+1\right)}}{(2r)^D}$$

$$= \frac{r^D \pi^{\frac{D}{2}}}{(2r)^D \Gamma\left(\frac{D}{2}+1\right)}$$

$$= \frac{\pi^{\frac{D}{2}}}{2^D \Gamma\left(\frac{D}{2}+1\right)}$$

In [41]: `Image('figures/hypercube.png',width=1000)`

Out[41]:



In [42]:
```python
# The Unit Porcupine (the unit hyper-sphere inscribed within the unit hyper-

import math

D = range(1,100) # dimensionality, D
V = [np.pi**(i/2)/(2**i*math.gamma(i/2 + 1)) for i in D] # ratio as a functi
dist_to_Corner = [math.sqrt(d)/2 for d in D] # distance

# plotting
plt.figure(figsize=(15,5))
plt.subplot(1,2,1); plt.plot(D, V)
plt.title('Ratio of Volume',size=15)
plt.xlabel('Dimensions, D',size=15)

plt.subplot(1,2,2)
plt.plot(D, dist_to_Corner)
plt.title('Distance to Corner of the Cube',size=15)
plt.xlabel('Dimensions, D',size=15);
```
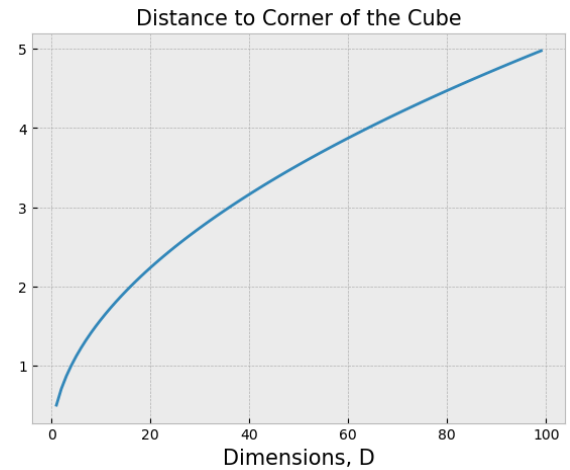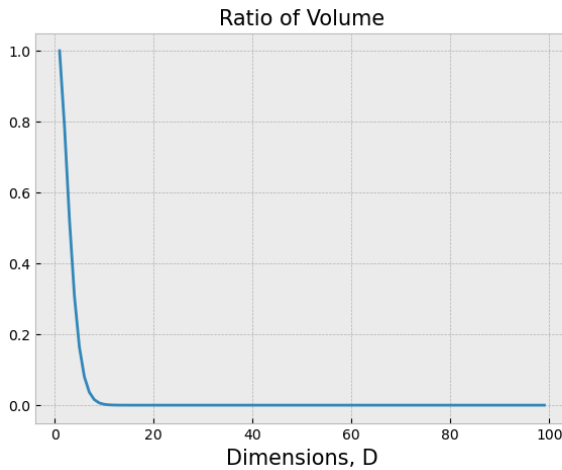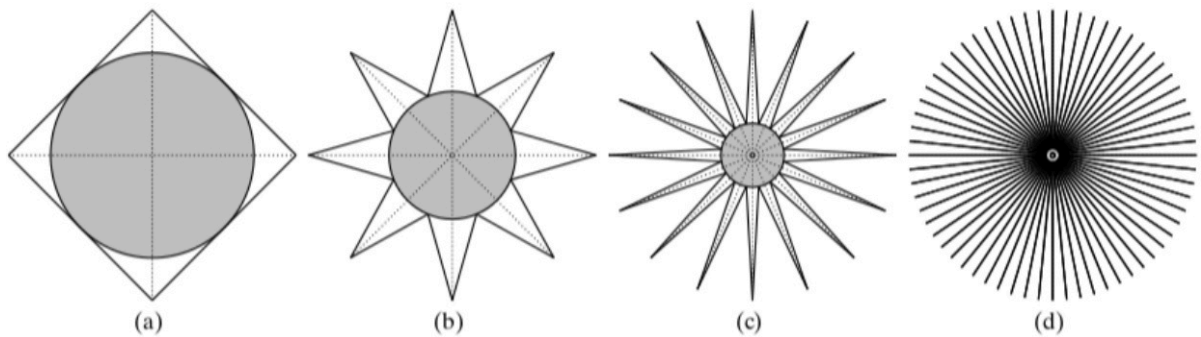
Ratio of Volume / Distance to Corner of the Cube plots with x-axis "Dimensions, D"

In [43]: `Image('figures/Unit Porcupine.jpg',width=800)`

Out[43]:



(a)     (b)     (c)     (d)

## Discussions

In the unit porcupine example, for higher-dimensionality $D$, all of the volume will reside in the "corners". So, distances between neighboring points is extremely large. The notion of **similarity** as measure by distances becomes a challenge.

As the dimensionality of the feature space increases, we need exponentially more data in order to explain a highly increasing volume.

We need to be careful choosing a model as that choice "injects" what we want the data to look like or follow a specific behavior. For example, in higher-dimensions, the tails of a Gaussian density function will become highly dense.

Always employ the **Occam's Razor** principle: the simplest model that works for our data is usually the most appropriate and sufficient. Model simplicity can mean different things, but we can consider a model to be complex if it has too many hyperparameter values to configure.

When we are in a high-dimensional input space (such as images), much of that space is empty. The input data can be represented in only a few *degrees of freedom* of variability. We say that the data in *embedded* in a **manifold** of equal dimensionality as the degrees of freedom (which is drastically smaller than the input space dimensionality). We will

study a few dimensionality reduction and manifold learning techniques later on in this course.

And again, intuitions or assumptions do not always hold in higher dimensions.