

Hw1

March 28, 2025

```
[1]: import numpy as np
import pandas as pd
import time
from sklearn.model_selection import train_test_split, KFold
from sklearn.preprocessing import StandardScaler
import matplotlib.pyplot as plt

# 1. Create proper column names
column_names = ['id', 'diagnosis']
feature_prefixes = ['radius', 'texture', 'perimeter', 'area',
                    'smoothness', 'compactness', 'concavity',
                    'concave_points', 'symmetry', 'fractal_dimension']

# Create mean, se, and worst for each feature
for prefix in feature_prefixes:
    column_names.extend([f'{prefix}_mean',
                        f'{prefix}_se',
                        f'{prefix}_worst'])

# 2. Load and prepare the data
data = pd.read_csv('breast+cancer+wisconsin+diagnostic/wdbc.data',
                  header=None,
                  names=column_names)

# 3. Convert diagnosis to binary (M=1, B=0)
data['diagnosis'] = (data['diagnosis'] == 'M').astype(int)

# 4. Separate features and target
X = data.drop(['id', 'diagnosis'], axis=1)
y = data['diagnosis']

# 5. Scale the features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

class KNNClassifier:
    def __init__(self, k=3):
        self.k = k
```

```

def euclidean_distance(self, x1, x2):
    return np.sqrt(np.sum((x1 - x2) ** 2))

def fit(self, X, y):
    self.X_train = np.array(X)
    self.y_train = np.array(y)

def predict(self, X):
    X = np.array(X)
    predictions = []

    for x in X:
        distances = [self.euclidean_distance(x, x_train) for x_train in self.
↪X_train]
        k_indices = np.argsort(distances)[:self.k]
        k_nearest_labels = self.y_train[k_indices]
        most_common = np.bincount(k_nearest_labels).argmax()
        predictions.append(most_common)

    return np.array(predictions)

def confusion_matrix(y_true, y_pred):
    tp = np.sum((y_true == 1) & (y_pred == 1))
    tn = np.sum((y_true == 0) & (y_pred == 0))
    fp = np.sum((y_true == 0) & (y_pred == 1))
    fn = np.sum((y_true == 1) & (y_pred == 0))
    return np.array([[tn, fp], [fn, tp]])

#set up k-fold cross validation
kf = KFold(n_splits = 6, shuffle = True, random_state = 42)
fold = 0
for train_index, test_index in kf.split(X_scaled):
    fold += 1
    start_time = time.time()

    # Split data for the current fold
    X_train, X_test = X_scaled[train_index], X_scaled[test_index]
    y_train, y_test = y.iloc[train_index], y.iloc[test_index]

    # Train and evaluate for current fold
    knn = KNNClassifier(k=3)
    knn.fit(X_train, y_train)
    y_pred = knn.predict(X_test)

    end_time = time.time()
    runtime = end_time - start_time

```

```

cm = confusion_matrix(np.array(y_test), y_pred)
accuracy = np.mean(y_pred == np.array(y_test))

print(f"Fold {fold}")
print(f"Accuracy: {accuracy:.4f}")
print("Confusion Matrix:")
print(cm)
print(f"Runtime (sec): {runtime:.4f}\n")

```

```

Fold 1
Accuracy: 0.9368
Confusion Matrix:
[[58  3]
 [ 3 31]]
Runtime (sec): 0.1543

```

```

Fold 2
Accuracy: 0.9789
Confusion Matrix:
[[60  1]
 [ 1 33]]
Runtime (sec): 0.1599

```

```

Fold 3
Accuracy: 0.9684
Confusion Matrix:
[[65  0]
 [ 3 27]]
Runtime (sec): 0.2048

```

```

Fold 4
Accuracy: 0.9684
Confusion Matrix:
[[57  0]
 [ 3 35]]
Runtime (sec): 0.1848

```

```

Fold 5
Accuracy: 0.9684
Confusion Matrix:
[[55  0]
 [ 3 37]]
Runtime (sec): 0.1701

```

```

Fold 6
Accuracy: 0.9362
Confusion Matrix:

```

```
[[57  1]
 [ 5 31]]
Runtime (sec): 0.1502
```

```
[2]: '''
Part 1 - KNN Classifier using Euclidean Distance
In this part, a custom KNN classifier was implemented and evaluated on the
    ↳breast cancer dataset
using 6-fold cross validation. The confusion matrices and high accuracy across
    ↳folds indicate that
the model reliably distinguishes between benign and malignant cases. Compared to
    ↳other classifiers
such as decision trees or SVMs, KNN is simple to implement and interpret;
    ↳however, it can be
computationally intense when scaling to larger datasets. Its performance in our
    ↳experiment
demonstrates that even this “lazy-learning” method can provide competitive
    ↳results when careful
pre-processing (like scaling features) is applied. In a practical setting, one
    ↳might prefer SVMs or
ensemble approaches for improved generalization and faster prediction times when
    ↳handling large
numbers of test samples.
'''
```

```
[2]: '\nPart 1 - KNN Classifier using Euclidean Distance\nIn this part, a custom KNN
classifier was implemented and evaluated on the breast cancer dataset\nusing
6-fold cross validation. The confusion matrices and high accuracy across folds
indicate that\nthe model reliably distinguishes between benign and malignant
cases. Compared to other classifiers\nsuch as decision trees or SVMs, KNN is
simple to implement and interpret; however, it can be\ncomputationally intense
when scaling to larger datasets. Its performance in our experiment\ndemonstrates
that even this “lazy-learning” method can provide competitive results when
careful\npre-processing (like scaling features) is applied. In a practical
setting, one might prefer SVMs or\nensemble approaches for improved
generalization and faster prediction times when handling large\nnumbers of test
samples.\n'
```

```
[3]: import numpy as np
import pandas as pd
from sklearn.model_selection import KFold
from sklearn.metrics import mean_squared_error
from sklearn.preprocessing import StandardScaler
import time

data = pd.read_csv("bike+sharing+dataset/hour.csv")
```

```

feature_cols = ['season', 'yr', 'mnth', 'hr', 'holiday', 'weekday', 'workingday',
'weathersit', 'temp', 'atemp', 'hum', 'windspeed']

X = data[feature_cols].values
y = data['cnt'].values

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

class KNNRegressor:
    def __init__(self, k=3):
        self.k = k

    def fit(self, X, y):
        self.X_train = np.array(X) # shape: (n_train, n_features)
        self.y_train = np.array(y) # shape: (n_train,)

    def predict(self, X):
        X = np.array(X) # shape: (n_test, n_features)
        # Compute Manhattan distances between each test and training instance in
        → a vectorized way:
        # We use broadcasting:
        # X[:, None, :] has shape (n_test, 1, n_features)
        # self.X_train has shape (n_train, n_features)
        # The subtraction produces an array of shape (n_test, n_train,
        → n_features)
        # Summing the absolute differences over axis=2 gives distances of shape
        → (n_test, n_train)
        distances = np.sum(np.abs(X[:, None, :] - self.X_train), axis=2)

        # Get the indices of the k smallest distances for each test sample.
        # np.argpartition is usually faster than argsort when you only need the
        → k smallest values.
        k_indices = np.argpartition(distances, self.k, axis=1)[:, :self.k]

        # Average the target values of the k nearest neighbors for each test
        → sample.
        predictions = np.mean(self.y_train[k_indices], axis=1)
        return predictions

kf = KFold(n_splits=6, shuffle=True, random_state=42)
fold = 0

for train_index, test_index in kf.split(X_scaled):
    fold += 1
    start_time = time.time()
    X_train, X_test = X_scaled[train_index], X_scaled[test_index]

```

```

y_train, y_test = y[train_index], y[test_index]

# Create and train the custom KNN regressor
knn_regressor = KNNRegressor(k = 3)
knn_regressor.fit(X_train, y_train)

# Predict the bike count on the test data
y_pred = knn_regressor.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)

end_time = time.time()
runtime = end_time - start_time

# Print performance measures for the current fold
print("Fold", fold)
print("Mean Squared Error: {:.4f}".format(mse))
print("Root mean Squared Error: {:.4f}".format(rmse))
print("Runtime (sec): {:.4f}".format(runtime))
print("-----\n")

```

```

Fold 1
Mean Squared Error: 10877.9503
Root mean Squared Error: 104.2974
Runtime (sec): 7.9422
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```

```

Fold 2
Mean Squared Error: 11411.8707
Root mean Squared Error: 106.8264
Runtime (sec): 4.6741
-----

```

```

Fold 3
Mean Squared Error: 11779.5558
Root mean Squared Error: 108.5337
Runtime (sec): 4.5920
-----

```

```

Fold 4
Mean Squared Error: 11183.0901
Root mean Squared Error: 105.7501
Runtime (sec): 3.9684
-----

```

```

Fold 5
Mean Squared Error: 12261.0396
Root mean Squared Error: 110.7296

```

Runtime (sec): 3.6992

Fold 6

Mean Squared Error: 11946.2836

Root mean Squared Error: 109.2991

Runtime (sec): 3.5447

```
[4]: '''
Part 2 - KNN Regressor using Manhattan Distance
For the regression task on bike-sharing counts, we implemented a custom KNN
    ↳regressor using
Manhattan (L1) distance. The performance was measured via mean squared error and
    ↳RMSE over 6
folds, showing a reasonable error range given the count magnitude. In comparison
    ↳with more
traditional regression models such as linear regression or SVR, KNN regression
    ↳is simple and non
parametric; however, it can be sensitive to irrelevant features and noisy data.
    ↳The significant
computational cost of KNN, especially for high-dimensional data, suggests that
    ↳while it is a good
baseline, other models might be more efficient for real-world applications.
    ↳Future work could
explore weighted distances or optimized nearest neighbor search methods to
    ↳further improve this approach
'''
```

```
[4]: '\nPart 2 - KNN Regressor using Manhattan Distance\nFor the regression task on
bike-sharing counts, we implemented a custom KNN regressor using\nManhattan (L1)
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SVR, KNN regression is simple and non\nparametric; however, it can be sensitive
to irrelevant features and noisy data. The significant\ncomputational cost of
KNN, especially for high-dimensional data, suggests that while it is a
good\nbaseline, other models might be more efficient for real-world
applications. Future work could\nexplore weighted distances or optimized nearest
neighbor search methods to further improve this approach\n'
```

```
[5]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.model_selection import KFold
from sklearn.svm import SVC
```

```

from sklearn.metrics import roc_curve, auc, confusion_matrix
from sklearn.preprocessing import StandardScaler
import time

#Define column names
column_names = ['id', 'diagnosis']
feature_prefixes = ['radius', 'texture', 'perimeter', 'area',
'smoothness', 'compactness', 'concavity',
'concave_points', 'symmetry', 'fractal_dimension']
for prefix in feature_prefixes:
    column_names.extend([f'{prefix}_mean', f'{prefix}_se', f'{prefix}_worst'])

#Load dataset
data = pd.read_csv('breast+cancer+wisconsin+diagnostic/wdbc.data',
header=None, names=column_names)

#convert diagnosis into binary and split into features and target
data['diagnosis'] = (data['diagnosis'] == 'M').astype(int)
X = data.drop(['id', 'diagnosis'], axis=1)
y = data['diagnosis']

#scale features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

#setup 6-fold cross validation

kf = KFold(n_splits=6, shuffle=True, random_state=42)
fold = 0

for train_index, test_index in kf.split(X_scaled):
    fold += 1
    start_time = time.time()
    # Create training and test data for the fold.
    X_train, X_test = X_scaled[train_index], X_scaled[test_index]
    y_train, y_test = y.iloc[train_index], y.iloc[test_index]

    # Initialize and train the linear SVM classifier.
    # We use probability=True so that we can get calibrated scores; however,
    ↪decision_function is used here.
    clf = SVC(kernel='linear', probability=True, random_state=42)
    clf.fit(X_train, y_train)

    # Get the decision scores for the test fold.
    decision_scores = clf.decision_function(X_test)

    # -----

```



```

# 3. ROC Curve and threshold selection
# -----
# Compute ROC curve data: fpr, tpr, and thresholds.
fpr, tpr, thresholds = roc_curve(y_test, decision_scores)
roc_auc = auc(fpr, tpr)

# Determine the best threshold. Using Youden's Index (maximizing TPR - FPR).
youden_index = tpr - fpr
best_index = np.argmax(youden_index)
best_threshold = thresholds[best_index]

# Use the best threshold to get adjusted predictions.
y_pred_adjusted = (decision_scores >= best_threshold).astype(int)

# Compute confusion matrix.
cm = confusion_matrix(y_test, y_pred_adjusted)

end_time = time.time()
runtime = end_time - start_time

# -----
# 4. Display performance and plot ROC curve
# -----
print(f"Fold {fold}")
print(f"Best threshold: {best_threshold:.4f}")
print(f"ROC AUC: {roc_auc:.4f}")
print("Confusion Matrix:")
print(cm)
print(f"Runtime (sec): {runtime:.4f}")
print("-----\n")

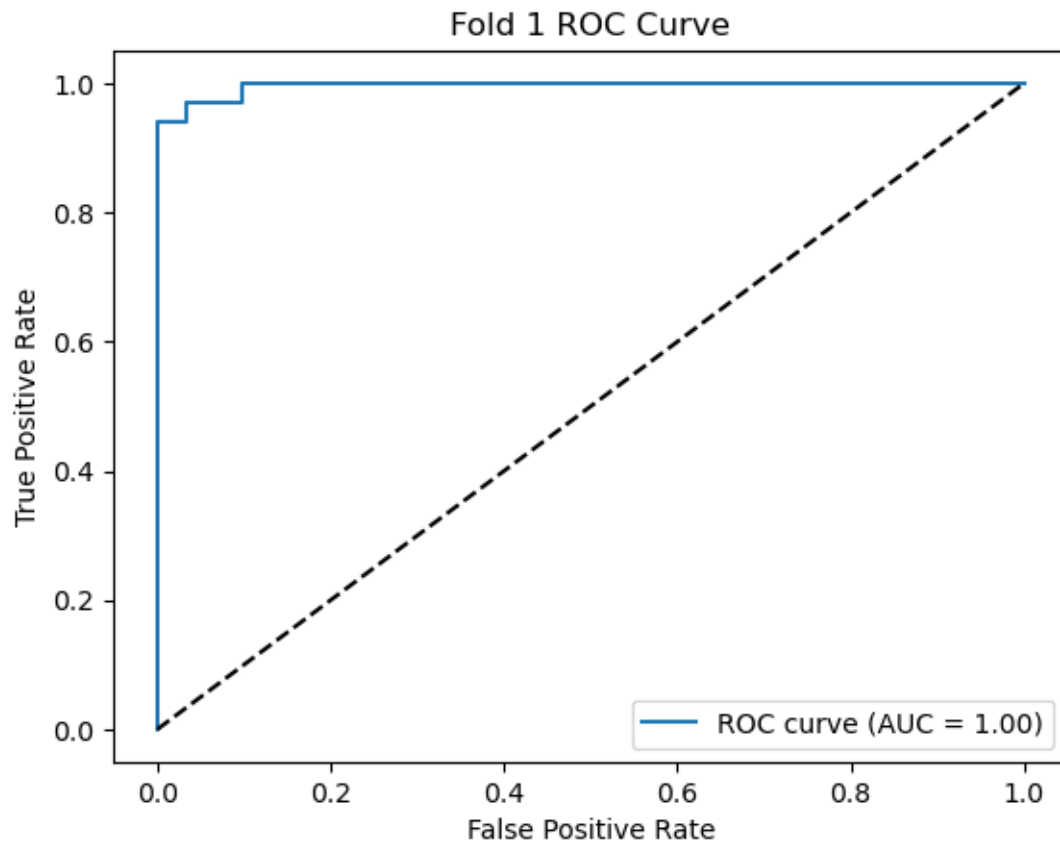
# Optionally, display the ROC curve for this fold.
plt.figure()
plt.plot(fpr, tpr, label=f'ROC curve (AUC = {roc_auc:.2f})')
plt.plot([0, 1], [0, 1], 'k--')
plt.xlabel("False Positive Rate")
plt.ylabel("True Positive Rate")
plt.title(f'Fold {fold} ROC Curve')
plt.legend(loc="lower right")
plt.show()

```

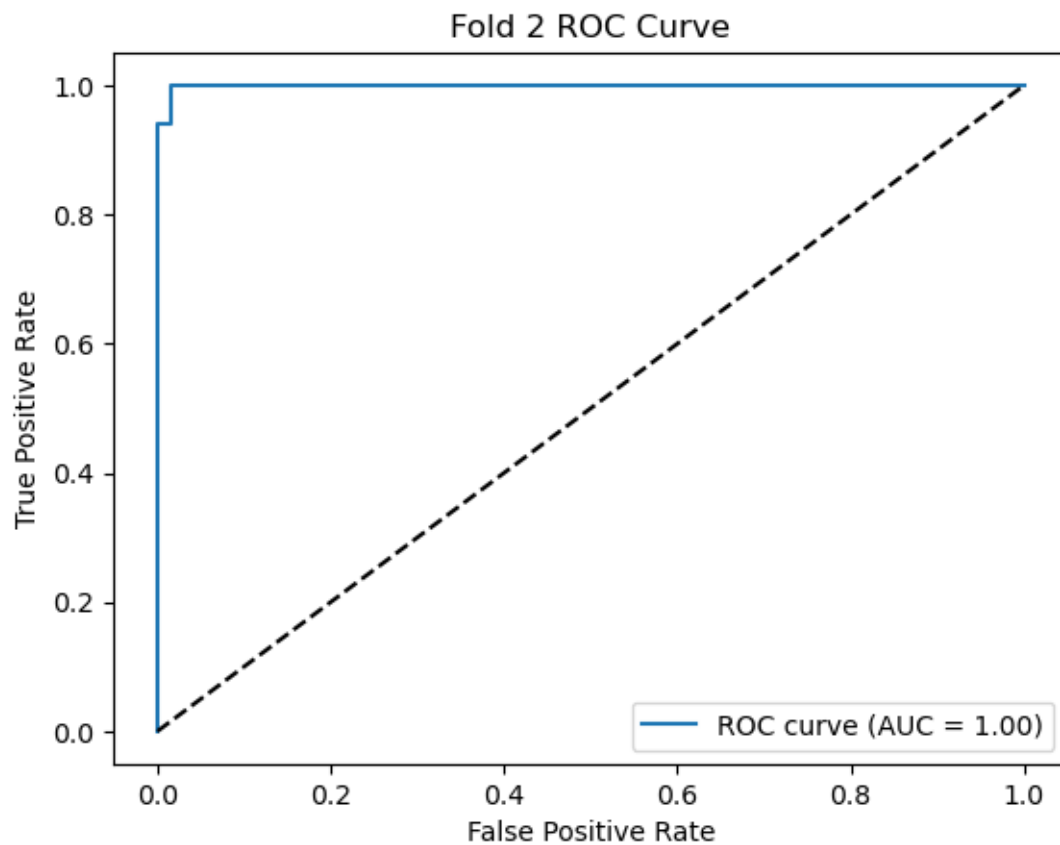
```

Fold 1
Best threshold: 0.3146
ROC AUC: 0.9961
Confusion Matrix:
[[61  0]
 [ 2 32]]
Runtime (sec): 0.0232

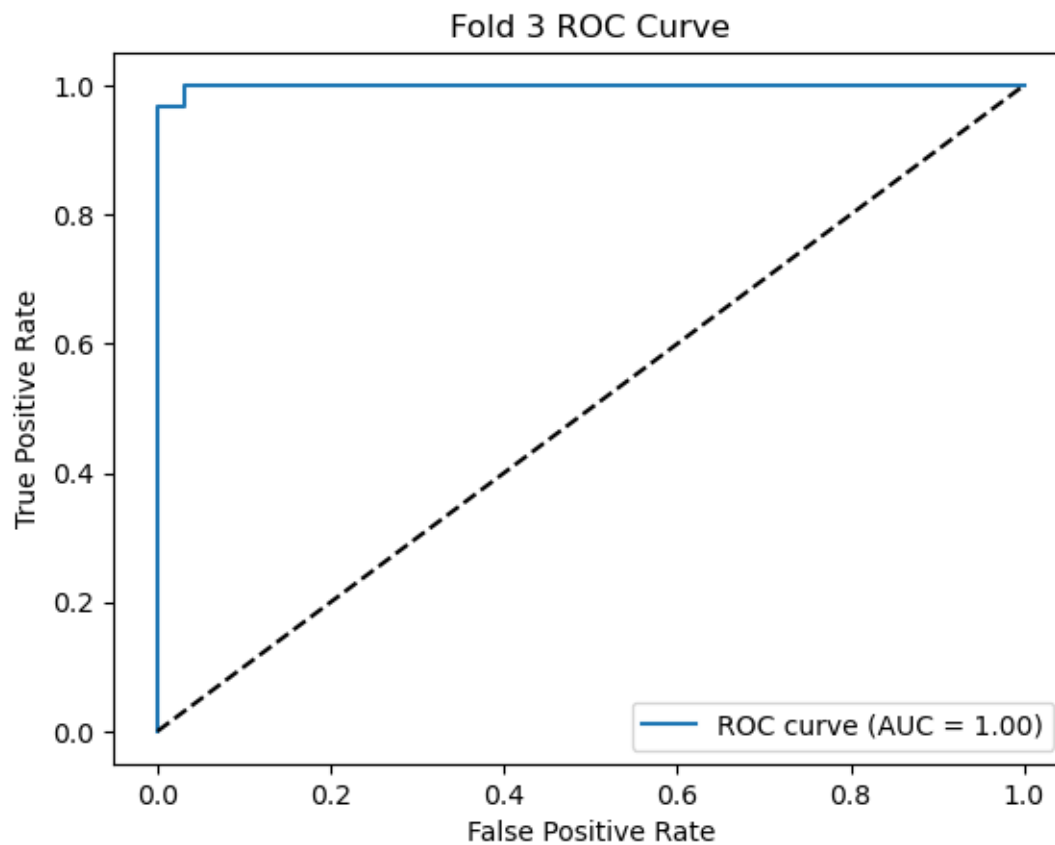
```



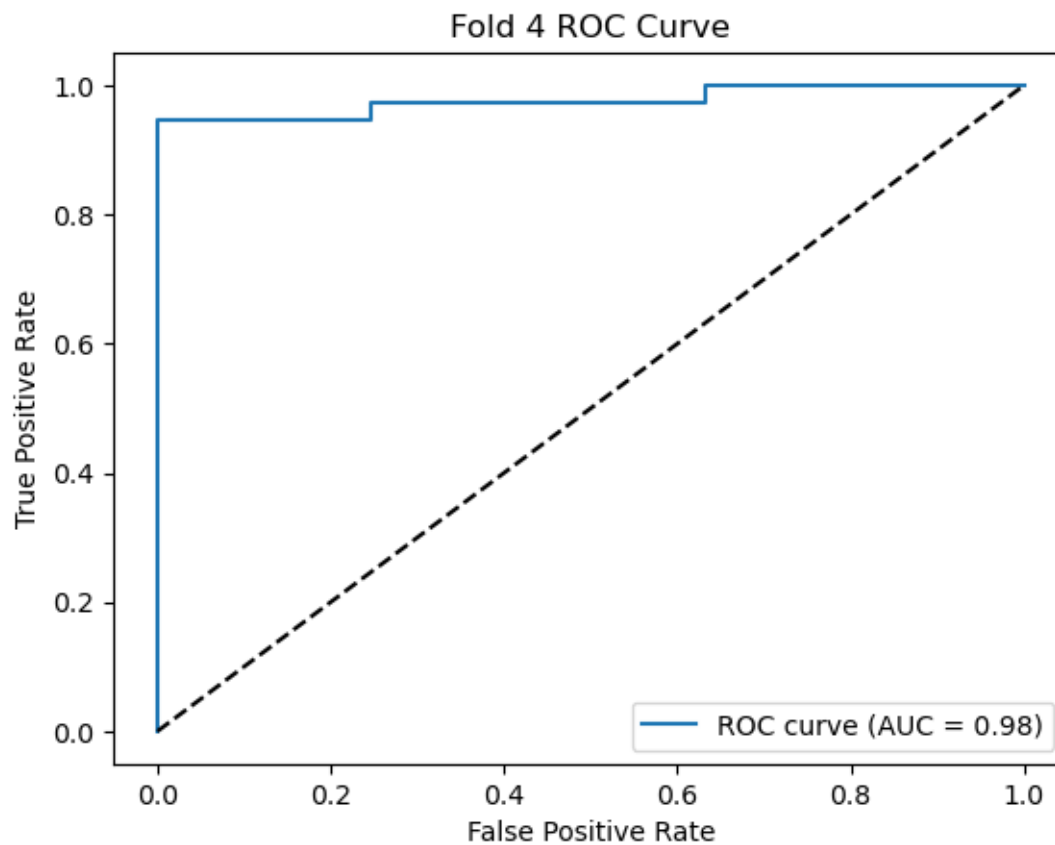
Fold 2
Best threshold: 0.4774
ROC AUC: 0.9990
Confusion Matrix:
[[60 1]
 [0 34]]
Runtime (sec): 0.0122



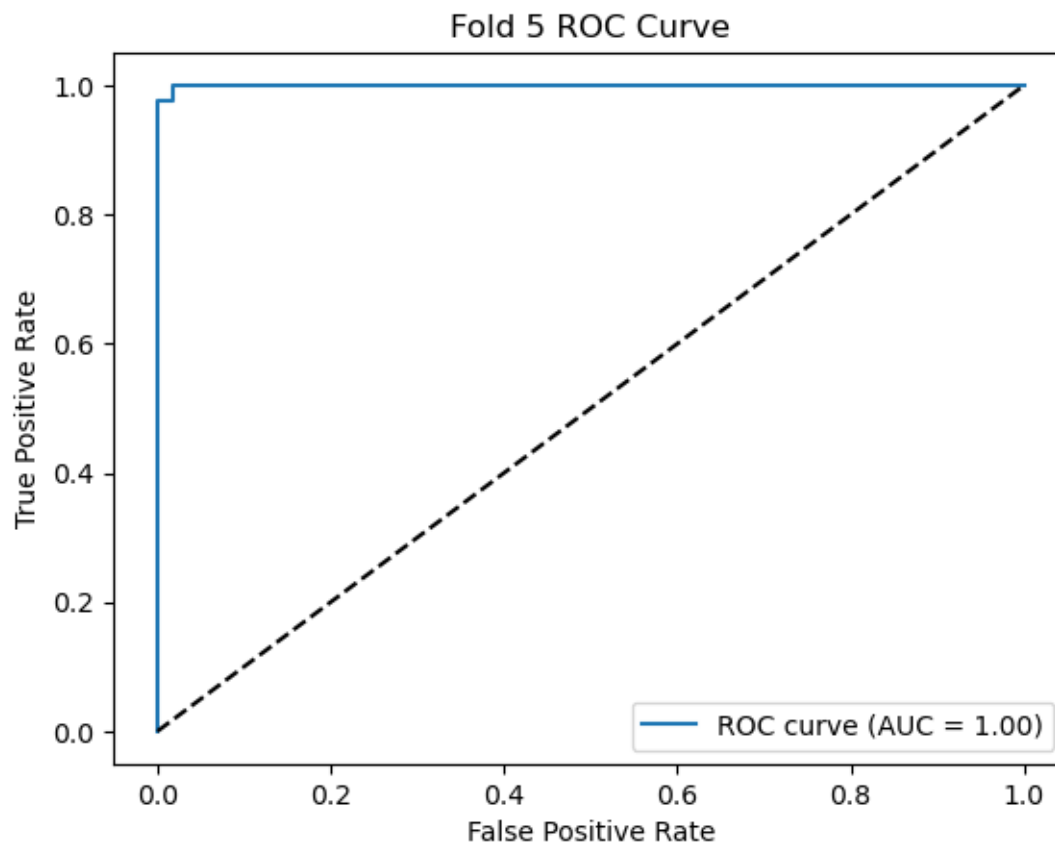
Fold 3
Best threshold: -0.3585
ROC AUC: 0.9990
Confusion Matrix:
[[63 2]
 [0 30]]
Runtime (sec): 0.0151



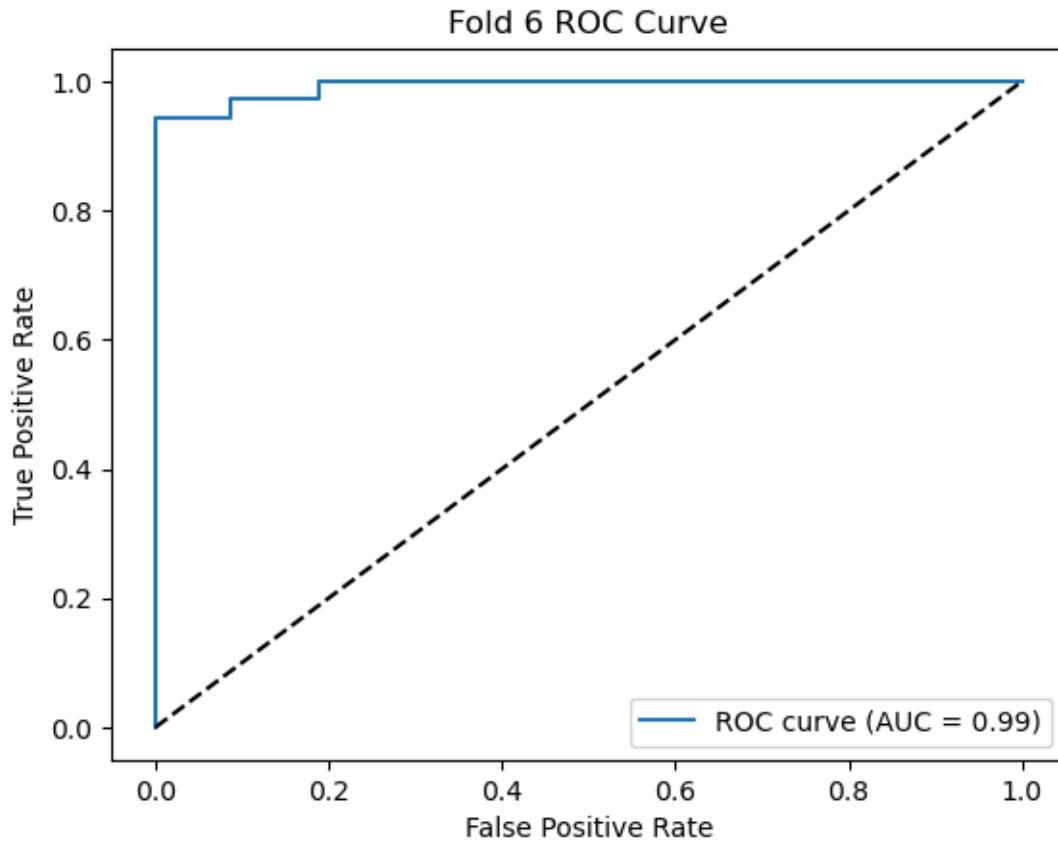
Fold 4
Best threshold: 0.0357
ROC AUC: 0.9769
Confusion Matrix:
[[57 0]
 [2 36]]
Runtime (sec): 0.0127



Fold 5
Best threshold: -1.1293
ROC AUC: 0.9995
Confusion Matrix:
[[54 1]
 [0 40]]
Runtime (sec): 0.0107



Fold 6
Best threshold: 0.2948
ROC AUC: 0.9923
Confusion Matrix:
[[58 0]
 [2 34]]
Runtime (sec): 0.0085



[6]: '''
 Part 3 - SVM Classifier (Linear Kernel)
 The linear SVM classifier built using scikit-learn provided exceptional
 → classification performance on
 the breast cancer dataset. The ROC curves from the cross validations indicate
 → that the classifier
 discriminates well between classes, with ROC AUC values above 0.97 in most folds.
 → In addition,
 threshold optimization using Youden's index helped convert the decision values
 → into well-calibrated
 predictions, which improved the confusion matrices. Compared to KNN, SVM has the
 → advantage of
 robust performance in high-dimensional spaces and a theoretically well-founded
 → margin-based
 approach. Although decision trees are interpretable, SVMs often provide better
 → performance when
 the classes can be separated linearly and when the training data is scaled
 → properly.
 '''

[6]: '\nPart 3 - SVM Classifier (Linear Kernel)\nThe linear SVM classifier built using scikit-learn provided exceptional classification performance on\nthe breast cancer dataset. The ROC curves from the cross validations indicate that the classifier\ndiscriminates well between classes, with ROC AUC values above 0.97 in most folds. In addition,\nthreshold optimization using Youden's index helped convert the decision values into well-calibrated\npredictions, which improved the confusion matrices. Compared to KNN, SVM has the advantage of\nrobust performance in high-dimensional spaces and a theoretically well-founded margin-based\napproach. Although decision trees are interpretable, SVMs often provide better performance when\nthe classes can be separated linearly and when the training data is scaled properly.\n'

```
[7]: import numpy as np
import pandas as pd
import time
from sklearn.svm import SVR
from sklearn.model_selection import KFold
from sklearn.metrics import mean_squared_error
from sklearn.preprocessing import StandardScaler

# Load the dataset
data = pd.read_csv("bike+sharing+dataset/hour.csv")

# I will use same features as in part 2
feature_cols = ['season', 'yr', 'mnth', 'hr', 'holiday', 'weekday', 'workingday',
'weathersit', 'temp', 'atemp', 'hum', 'windspeed']
X = data[feature_cols].values
y = data['cnt'].values

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# Set up 6 fold cross validation
kf = KFold(n_splits=6, shuffle=True, random_state=42)
fold = 0

for train_index, test_index in kf.split(X_scaled):
    fold += 1
    start_time = time.time()
    # Split data for the current fold
    X_train, X_test = X_scaled[train_index], X_scaled[test_index]
    y_train, y_test = y[train_index], y[test_index]

    # 4. Create and train a linear SVM regressor (SVR)
    svr = SVR(kernel='linear', C=1.0)
    svr.fit(X_train, y_train)
```



```

# Predict on the test set
y_pred = svr.predict(X_test)

# 5. Compute performance: Mean Squared Error and RMSE
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)

end_time = time.time()
runtime = end_time - start_time

# Print results for this fold
print("Fold", fold)
print("Mean Squared Error: {:.4f}".format(mse))
print("Root Mean Squared Error: {:.4f}".format(rmse))
print("Runtime (sec): {:.4f}".format(runtime))
print("-----\n")

```

```

Fold 1
Mean Squared Error: 20431.4538
Root Mean Squared Error: 142.9386
Runtime (sec): 5.2602
-----

```

```

Fold 2
Mean Squared Error: 21088.4674
Root Mean Squared Error: 145.2187
Runtime (sec): 6.3681
-----

```

```

Fold 3
Mean Squared Error: 21968.3299
Root Mean Squared Error: 148.2172
Runtime (sec): 5.7910
-----

```

```

Fold 4
Mean Squared Error: 21125.5018
Root Mean Squared Error: 145.3461
Runtime (sec): 7.0014
-----

```

```

Fold 5
Mean Squared Error: 23850.0904
Root Mean Squared Error: 154.4347
Runtime (sec): 7.0584
-----

```

```

Fold 6

```

Mean Squared Error: 22443.5457
Root Mean Squared Error: 149.8117
Runtime (sec): 6.2313

```
[8]: '''  
Part 4 - SVM Regressor (Linear Kernel)  
Using scikit-learn's SVR with a linear kernel, we implemented a regression model,  
→on the bike-sharing  
dataset. The SVR model achieved consistent MSE and RMSE values across folds,  
→indicating stable  
performance in predicting bike counts. Compared to the KNN regressor, SVR,  
→generally scales better  
with larger datasets and can better handle cases where the relationship between,  
→features and  
target is linear. While the SVR might sometimes underfit if the relationship is,  
→nonlinear, it serves as a  
robust baseline and is often more efficient than distance-based methods for,  
→large-scale prediction  
tasks. A comparison with decision tree regression (explained in Part 6) reveals,  
→that linear models  
like SVR are less interpretable but may offer improved generalization on unseen,  
→data if the  
underlying assumptions hold.  
'''
```

```
[8]: '\nPart 4 - SVM Regressor (Linear Kernel)\nUsing scikit-learn's SVR with a  
linear kernel, we implemented a regression model on the bike-sharing\ndataset.  
The SVR model achieved consistent MSE and RMSE values across folds, indicating  
stable\nperformance in predicting bike counts. Compared to the KNN regressor,  
SVR generally scales better\nwith larger datasets and can better handle cases  
where the relationship between features and\ntarget is linear. While the SVR  
might sometimes underfit if the relationship is nonlinear, it serves as  
a\nrobust baseline and is often more efficient than distance-based methods for  
large-scale prediction\ntasks. A comparison with decision tree regression  
(explained in Part 6) reveals that linear models\nlike SVR are less  
interpretable but may offer improved generalization on unseen data if  
the\nunderlying assumptions hold.\n'
```

```
[9]: # Strategy A: Limit tree depth (using max_depth=5)  
# Strategy B: Increase the minimum number of samples required to split (using  
→min_samples_split=10)  
  
import numpy as np  
import pandas as pd  
import time
```

```

from sklearn.model_selection import KFold
from sklearn.metrics import confusion_matrix
from sklearn.tree import DecisionTreeClassifier, export_text
from sklearn.preprocessing import StandardScaler

# Load Dataset
column_names = ['id', 'diagnosis']
feature_prefixes = ['radius', 'texture', 'perimeter', 'area',
                    'smoothness', 'compactness', 'concavity',
                    'concave_points', 'symmetry', 'fractal_dimension']
for prefix in feature_prefixes:
    column_names.extend([f'{prefix}_mean', f'{prefix}_se', f'{prefix}_worst'])

data = pd.read_csv('breast+cancer+wisconsin+diagnostic/wdbc.data', header=None,
    ↪ names=column_names)

data['diagnosis'] = (data['diagnosis'] == 'M').astype(int)

X = data.drop(['id', 'diagnosis'], axis=1)
y = data['diagnosis']

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

#Function for cross validation with DT classifier
def dt_classifier_cv(X, y, n_splits=6, max_depth=None, min_samples_split=2):
    """
    Perform K-Fold CV with Decision Tree Classifier using given pruning
    ↪ parameters.
    Returns:
    cms: list of confusion matrices for each fold.
    runtimes: list of run times per fold.
    last_tree: the DecisionTreeClassifier from the last fold (for rule
    ↪ extraction)
    """
    kf = KFold(n_splits=n_splits, shuffle=True, random_state=42)
    cms = []
    runtimes = []
    last_tree = None
    fold = 0
    for train_index, test_index in kf.split(X):
        fold += 1
        start_time = time.time()
        X_train, X_test = X[train_index], X[test_index]
        y_train, y_test = y.iloc[train_index], y.iloc[test_index]

```

```

        # Initialize Decision Tree Classifier with the specified pruning
        ↪ parameters
        clf = DecisionTreeClassifier(max_depth=max_depth,
                                     min_samples_split=min_samples_split,
                                     random_state=42)

        clf.fit(X_train, y_train)
        y_pred = clf.predict(X_test)
        cm = confusion_matrix(y_test, y_pred)
        cms.append(cm)

        end_time = time.time()
        runtimes.append(end_time - start_time)

        print(f"Fold {fold}")
        print("Confusion Matrix:")
        print(cm)
        print("Runtime (sec): {:.4f}".format(end_time - start_time))
        print("-----\n")

        # Save the last tree for rule extraction
        last_tree = clf

    return cms, runtimes, last_tree

print("=== Strategy A: max_depth=5, min_samples_split=2 ===")
cms_A, runtimes_A, tree_A = dt_classifier_cv(X_scaled, y, n_splits=6,
        ↪ max_depth=5, min_samples_split=2)

print("\n=== Strategy B: no max_depth but min_samples_split=10 ===")
cms_B, runtimes_B, tree_B = dt_classifier_cv(X_scaled, y, n_splits=6,
        ↪ max_depth=None, min_samples_split=10)

#Function to convert a DT into a set of rules
def tree_to_rules(decision_tree, feature_names):
    """
        Returns a textual representation of the decision rules from a trained
        ↪ decision tree.
    """
    rules = export_text(decision_tree, feature_names=feature_names)
    return rules

feature_names = list(X.columns)
print("\nExtracted Decision Rules from Strategy A Tree (max_depth=5):\n")
rules_text = tree_to_rules(tree_A, feature_names)
print(rules_text)

```

```

=== Strategy A: max_depth=5, min_samples_split=2 ===

```

Fold 1
Confusion Matrix:
[[59 2]
 [5 29]]
Runtime (sec): 0.0105

Fold 2
Confusion Matrix:
[[58 3]
 [3 31]]
Runtime (sec): 0.0080

Fold 3
Confusion Matrix:
[[64 1]
 [3 27]]
Runtime (sec): 0.0072

Fold 4
Confusion Matrix:
[[54 3]
 [4 34]]
Runtime (sec): 0.0053

Fold 5
Confusion Matrix:
[[51 4]
 [3 37]]
Runtime (sec): 0.0076

Fold 6
Confusion Matrix:
[[56 2]
 [3 33]]
Runtime (sec): 0.0077

=== Strategy B: no max_depth but min_samples_split=10 ===

Fold 1
Confusion Matrix:
[[59 2]
 [5 29]]

Runtime (sec): 0.0079

Fold 2

Confusion Matrix:

```
[[58  3]
 [ 1 33]]
```

Runtime (sec): 0.0094

Fold 3

Confusion Matrix:

```
[[64  1]
 [ 2 28]]
```

Runtime (sec): 0.0107

Fold 4

Confusion Matrix:

```
[[55  2]
 [ 3 35]]
```

Runtime (sec): 0.0079

Fold 5

Confusion Matrix:

```
[[52  3]
 [ 3 37]]
```

Runtime (sec): 0.0070

Fold 6

Confusion Matrix:

```
[[54  4]
 [ 3 33]]
```

Runtime (sec): 0.0084

Extracted Decision Rules from Strategy A Tree (max_depth=5):

```
|--- concave_points_worst <= 0.01
|   |--- fractal_dimension_mean <= 0.70
|   |   |--- fractal_dimension_mean <= 0.27
|   |   |   |--- smoothness_mean <= 1.77
|   |   |   |   |--- smoothness_se <= -0.04
|   |   |   |   |   |--- class: 0
|   |   |   |   |   |--- smoothness_se > -0.04
```

```

|   |   |   |   |   |--- class: 0
|   |   |   |--- smoothness_mean > 1.77
|   |   |   |--- class: 1
|   |   |--- fractal_dimension_mean > 0.27
|   |   |--- concave_points_mean <= 0.51
|   |   |   |--- concave_points_worst <= -0.12
|   |   |   |   |--- class: 0
|   |   |   |   |--- concave_points_worst > -0.12
|   |   |   |   |--- class: 1
|   |   |   |--- concave_points_mean > 0.51
|   |   |   |--- class: 1
|   |--- fractal_dimension_mean > 0.70
|   |   |--- concave_points_mean <= -0.36
|   |   |--- class: 0
|   |   |--- concave_points_mean > -0.36
|   |   |--- class: 1
|--- concave_points_worst > 0.01
|   |--- perimeter_mean <= -0.21
|   |   |--- radius_se <= 0.06
|   |   |   |--- compactness_worst <= -0.90
|   |   |   |--- class: 1
|   |   |   |--- compactness_worst > -0.90
|   |   |   |--- class: 0
|   |   |--- radius_se > 0.06
|   |   |--- class: 1
|   |--- perimeter_mean > -0.21
|   |--- class: 1

```

[10]: '''

Part 5 - Decision Tree Classifier

For classification, decision trees were evaluated using two pruning strategies:␣

- one restricting*

maximum depth (Strategy A) and one increasing the minimum samples required to␣

- split (Strategy B).*

The cross validation results indicate that both strategies provided comparable␣

- confusion matrices*

with only slight differences, each maintaining low misclassification rates. The␣

- major advantage of*

decision trees is their interpretability, especially after they have been␣

- converted to a set of decision*

rules using export_text, which aids in explaining model decisions. Compared to␣

- SVMs, which often*

require more complex threshold selection and kernel tuning, decision trees␣

- provide a transparent*

“if/then” structure that can be easier to communicate to stakeholders. However,␣

- decision trees can*

```

be prone to overfitting, so the effectiveness of pruning is crucial; in our
→experiments, both strategies
produced models with similar performance, suggesting that balancing tree
→complexity is key.
'''

```

```

[10]: '\nPart 5 - Decision Tree Classifier\nFor classification, decision trees were
evaluated using two pruning strategies: one restricting\nmaximum depth (Strategy
A) and one increasing the minimum samples required to split (Strategy B).\nThe
cross validation results indicate that both strategies provided comparable
confusion matrices\nwith only slight differences, each maintaining low
misclassification rates. The major advantage of\ndecision trees is their
interpretability, especially after they have been converted to a set of
decision\nrules using export_text, which aids in explaining model decisions.
Compared to SVMs, which often\nrequire more complex threshold selection and
kernel tuning, decision trees provide a transparent\n“if/then” structure that
can be easier to communicate to stakeholders. However, decision trees can\nbe
prone to overfitting, so the effectiveness of pruning is crucial; in our
experiments, both strategies\nproduced models with similar performance,
suggesting that balancing tree complexity is key.\n'

```

```

[11]: import numpy as np
import pandas as pd
import time
from sklearn.tree import DecisionTreeRegressor, export_text
from sklearn.model_selection import KFold
from sklearn.metrics import mean_squared_error
from sklearn.preprocessing import StandardScaler

data = pd.read_csv("bike+sharing+dataset/hour.csv")
feature_cols = ['season', 'yr', 'mnth', 'hr', 'holiday', 'weekday', 'workingday',
'weathersit', 'temp', 'atemp', 'hum', 'windspeed']
X = data[feature_cols].values
y = data['cnt'].values
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

kf = KFold(n_splits=6, shuffle=True, random_state=42)
fold = 0

for train_index, test_index in kf.split(X_scaled):
    fold += 1
    start_time = time.time()
    # Split into training and testing sets for the fold
    X_train, X_test = X_scaled[train_index], X_scaled[test_index]
    y_train, y_test = y[train_index], y[test_index]

```



```

# Create and train the Decision Tree Regressor.
# You can experiment with parameters such as max_depth or min_samples_split.
reg = DecisionTreeRegressor(random_state=42)
reg.fit(X_train, y_train)

# Predict on the test set
y_pred = reg.predict(X_test)

# Calculate performance
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)

end_time = time.time()
runtime = end_time - start_time

# Print results for the current fold
print("Fold", fold)
print("Mean Squared Error: {:.4f}".format(mse))
print("Root Mean Squared Error: {:.4f}".format(rmse))
print("Runtime (sec): {:.4f}".format(runtime))
print("-----\n")

#function to convert DT regressor into rules

def tree_reg_rules(decision_tree, feature_names):
    """
    Extracts and returns a textual set of rules for a Decision Tree Regressor.
    Each rule corresponds to a path from the root node down to a leaf node.
    """
    rules = export_text(decision_tree, feature_names=feature_names)
    return rules

feature_names = list(data[feature_cols].columns)
print("\nExtracted Decision Tree Regressor Rules:\n")
rules_text = tree_reg_rules(reg, feature_names)
print(rules_text)

```

```

Fold 1
Mean Squared Error: 3575.2516
Root Mean Squared Error: 59.7934
Runtime (sec): 0.0747
-----

```

```

Fold 2
Mean Squared Error: 3328.8882
Root Mean Squared Error: 57.6965
Runtime (sec): 0.0747
-----

```

Fold 3
Mean Squared Error: 3916.5665
Root Mean Squared Error: 62.5825
Runtime (sec): 0.0724

Fold 4
Mean Squared Error: 3885.3211
Root Mean Squared Error: 62.3323
Runtime (sec): 0.0692

Fold 5
Mean Squared Error: 3328.5081
Root Mean Squared Error: 57.6932
Runtime (sec): 0.0714

Fold 6
Mean Squared Error: 3897.6053
Root Mean Squared Error: 62.4308
Runtime (sec): 0.0728

Extracted Decision Tree Regressor Rules:

```
|--- hr <= -0.73
|   |--- hr <= -0.87
|   |   |--- hr <= -1.45
|   |   |   |--- workingday <= -0.39
|   |   |   |   |--- atemp <= 0.01
|   |   |   |   |   |--- season <= -0.90
|   |   |   |   |   |   |--- yr <= -0.01
|   |   |   |   |   |   |   |--- atemp <= -1.40
|   |   |   |   |   |   |   |   |--- mnth <= 0.28
|   |   |   |   |   |   |   |   |   |--- hum <= -0.06
|   |   |   |   |   |   |   |   |   |   |--- atemp <= -1.49
|   |   |   |   |   |   |   |   |   |   |   |--- truncated branch of depth 6
|   |   |   |   |   |   |   |   |   |   |   |--- atemp > -1.49
|   |   |   |   |   |   |   |   |   |   |   |--- truncated branch of depth 2
|   |   |   |   |   |   |   |   |   |   |   |--- hum > -0.06
|   |   |   |   |   |   |   |   |   |   |   |--- temp <= -1.39
|   |   |   |   |   |   |   |   |   |   |   |--- truncated branch of depth 6
|   |   |   |   |   |   |   |   |   |   |   |--- temp > -1.39
|   |   |   |   |   |   |   |   |   |   |   |--- value: [18.00]
|   |   |   |   |   |   |   |   |   |   |   |--- mnth > 0.28
```

[illegible]

```
| | | | | | | | |--- atemp> -1.23
| | | | | | | | |--- atemp <= -0.30
| | | | | | | | |   |--- weekday <= -1.25
| | | | | | | | |     |--- hum <= -0.40
| | | | | | | | |       |--- truncated branch of depth 4
| | | | | | | | |         |--- hum > -0.40
| | | | | | | | |           |--- value: [48.00]
| | | | | | | | |             |--- weekday > -1.25
| | | | | | | | |               |--- weekday <= 0.25
| | | | | | | | |                 |--- truncated branch of depth 2
| | | | | | | | |                   |--- weekday > 0.25
| | | | | | | | |                     |--- truncated branch of depth 7
| | | | | | | | |                       |--- atemp > -0.30
| | | | | | | | |                         |--- weekday <= -0.00
| | | | | | | | |                           |--- hum <= 1.15
| | | | | | | | |                               |--- value: [113.00]
| | | | | | | | |                                   |--- hum > 1.15
| | | | | | | | |                                       |--- value: [107.00]
| | | | | | | | |                                           |--- weekday > -0.00
| | | | | | | | |                                               |--- value: [100.00]
| | | | | | | | |--- season > -0.90
| | | | | | | | |   |--- yr <= -0.01
| | | | | | | | |     |--- mnth <= -0.59
| | | | | | | | |       |--- atemp <= -0.26
| | | | | | | | |         |--- temp <= -0.82
| | | | | | | | |           |--- hum <= 1.60
| | | | | | | | |             |--- truncated branch of depth 4
| | | | | | | | |               |--- hum > 1.60
| | | | | | | | |                 |--- truncated branch of depth 2
| | | | | | | | |                   |--- temp > -0.82
| | | | | | | | |                     |--- hr <= -1.60
| | | | | | | | |                       |--- truncated branch of depth 2
| | | | | | | | |                         |--- hr > -1.60
| | | | | | | | |                           |--- truncated branch of depth 2
| | | | | | | | |                               |--- atemp > -0.26
| | | | | | | | |                                   |--- weekday <= 1.24
| | | | | | | | |                                       |--- hum <= 0.48
| | | | | | | | |                                           |--- value: [27.00]
| | | | | | | | |                                               |--- hum > 0.48
| | | | | | | | |                                                   |--- value: [33.00]
| | | | | | | | |                                                       |--- weekday > 1.24
| | | | | | | | |                                                           |--- hr <= -1.60
| | | | | | | | |                                                               |--- value: [106.00]
| | | | | | | | |                                                                   |--- hr > -1.60
| | | | | | | | |                                                                       |--- value: [74.00]
| | | | | | | | |--- mnth > -0.59
| | | | | | | | |   |--- atemp <= -0.52
| | | | | | | | |     |--- weekday <= -0.50
```

[illegible]

```
| | | | | | | | | |--- atemp > -0.92  
| | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | |--- value: [49.00]  
| | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | |--- value: [46.00]  
| | | | | | | | |--- windspeed > -0.46  
| | | | | | | | |--- atemp <= -0.61  
| | | | | | | | |--- value: [37.00]  
| | | | | | | | |--- atemp > -0.61  
| | | | | | | | |--- value: [30.00]  
| | | |--- atemp > 0.01  
| | | |--- hr <= -1.60  
| | | |--- yr <= -0.01  
| | | |--- hum <= 1.47  
| | | |--- season <= 0.90  
| | | |--- weathersit <= 0.12  
| | | |--- season <= -0.00  
| | | |--- truncated branch of depth 6  
| | | |--- season > -0.00  
| | | |--- truncated branch of depth 7  
| | | |--- weathersit > 0.12  
| | | |--- mnth <= 0.28  
| | | |--- truncated branch of depth 3  
| | | |--- mnth > 0.28  
| | | |--- truncated branch of depth 4  
| | | |--- season > 0.90  
| | | |--- atemp <= 0.23  
| | | |--- value: [130.00]  
| | | |--- atemp > 0.23  
| | | |--- value: [173.00]  
| | | |--- hum > 1.47  
| | | |--- temp <= 0.28  
| | | |--- holiday <= 2.82  
| | | |--- value: [39.00]  
| | | |--- holiday > 2.82  
| | | |--- value: [53.00]  
| | | |--- temp > 0.28  
| | | |--- windspeed <= -1.19  
| | | |--- value: [116.00]  
| | | |--- windspeed > -1.19  
| | | |--- season <= 0.45  
| | | |--- value: [103.00]  
| | | |--- season > 0.45  
| | | |--- value: [93.00]  
| | | |--- yr > -0.01  
| | | |--- weathersit <= 0.12  
| | | |--- holiday <= 2.82  
| | | |--- mnth <= -0.01
```

[illegible]

[illegible]

[illegible]

```
| | | | | | | | | |--- atemp > -1.05  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- season > 0.45  
| | | | | | | | | |--- windspeed <= 0.64  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- hum <= 0.79  
| | | | | | | | | |--- temp <= -1.07  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- temp > -1.07  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- hum > 0.79  
| | | | | | | | | |--- windspeed <= 0.03  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- windspeed > 0.03  
| | | | | | | | | |--- value: [31.00]  
| | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- hum <= -0.53  
| | | | | | | | | |--- value: [30.00]  
| | | | | | | | | |--- hum > -0.53  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- value: [65.00]  
| | | | | | | | | |--- windspeed > 0.64  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | |--- value: [24.00]  
| | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- value: [44.00]  
| | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | |--- value: [55.00]  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- value: [21.00]  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- value: [283.00]  
| | | | | | | | | |--- temp > -0.56  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- temp <= 0.43  
| | | | | | | | | |--- hum <= 1.03  
| | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > 1.03  
| | | | | | | | | |--- weathersit <= 1.68
```

```
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- temp > 0.43  
| | | | | | | | |--- weekday <= 0.25  
| | | | | | | | |--- temp <= 1.21  
| | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | |--- temp > 1.21  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- weekday > 0.25  
| | | | | | | | |--- windspeed <= -0.76  
| | | | | | | | |--- value: [17.00]  
| | | | | | | | |--- windspeed > -0.76  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | |--- yr > -0.01  
| | | | | | | |--- weekday <= 0.25  
| | | | | | | |--- weathersit <= 0.12  
| | | | | | | |--- mnth <= -0.59  
| | | | | | | |--- truncated branch of depth 7  
| | | | | | | |--- mnth > -0.59  
| | | | | | | |--- truncated branch of depth 9  
| | | | | | | |--- weathersit > 0.12  
| | | | | | | |--- atemp <= -0.04  
| | | | | | | |--- truncated branch of depth 5  
| | | | | | | |--- atemp > -0.04  
| | | | | | | |--- truncated branch of depth 10  
| | | | | | | |--- weekday > 0.25  
| | | | | | | |--- temp <= -0.14  
| | | | | | | |--- hum <= 1.18  
| | | | | | | |--- truncated branch of depth 2  
| | | | | | | |--- hum > 1.18  
| | | | | | | |--- value: [11.00]  
| | | | | | | |--- temp > -0.14  
| | | | | | | |--- windspeed <= -0.09  
| | | | | | | |--- truncated branch of depth 10  
| | | | | | | |--- windspeed > -0.09  
| | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- weekday > 0.75  
| | | | | | | |--- yr <= -0.01  
| | | | | | | |--- atemp <= 0.63  
| | | | | | | |--- weathersit <= 1.68  
| | | | | | | |--- season <= -0.90  
| | | | | | | |--- truncated branch of depth 2  
| | | | | | | |--- season > -0.90  
| | | | | | | |--- truncated branch of depth 6  
| | | | | | | |--- weathersit > 1.68  
| | | | | | | |--- temp <= 0.12  
| | | | | | | |--- value: [9.00]
```


[illegible]

```
| | | | | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | | | | |--- hum <= -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | | | |--- hum > -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | | | | |--- temp <= -0.76  
| | | | | | | | | | | | |--- mnth <= 0.13  
| | | | | | | | | | | | |--- temp <= -1.02  
| | | | | | | | | | | | |--- value: [4.00]  
| | | | | | | | | | | | |--- temp > -1.02  
| | | | | | | | | | | | |--- value: [9.00]  
| | | | | | | | | | | | |--- mnth > 0.13  
| | | | | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- temp > -0.76  
| | | | | | | | | | | | |--- mnth <= 1.15  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- mnth > 1.15  
| | | | | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | | | | |--- value: [17.00]  
| | | | | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | | | | |--- value: [9.00]  
| | | | | | | | | | | | |--- temp > -0.04  
| | | | | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- temp <= 0.69  
| | | | | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | | | | |--- hum <= -0.04  
| | | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | | | |--- hum > -0.04  
| | | | | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- temp > 0.69  
| | | | | | | | | | | | |--- hum <= 0.14  
| | | | | | | | | | | | |--- temp <= 1.11  
| | | | | | | | | | | | |--- truncated branch of depth 5
```

```
| | | | | | | | | | | | |--- temp > 1.11  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- hum > 0.14  
| | | | | | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | | | | |--- windspeed <= 1.37  
| | | | | | | | | | | | |--- hum <= 1.49  
| | | | | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | | | | |--- hum > 1.49  
| | | | | | | | | | | | |--- value: [5.00]  
| | | | | | | | | | | | |--- windspeed > 1.37  
| | | | | | | | | | | | |--- temp <= 0.48  
| | | | | | | | | | | | |--- value: [29.00]  
| | | | | | | | | | | | |--- temp > 0.48  
| | | | | | | | | | | | |--- value: [30.00]  
| | | | | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | | | | |--- mnth <= 1.30  
| | | | | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- mnth > 1.30  
| | | | | | | | | | | | |--- value: [11.00]  
| | | | | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- temp <= 0.79  
| | | | | | | | | | | | |--- hum <= 1.78  
| | | | | | | | | | | | |--- atemp <= 0.10  
| | | | | | | | | | | | |--- value: [31.00]  
| | | | | | | | | | | | |--- atemp > 0.10  
| | | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | | |--- hum > 1.78  
| | | | | | | | | | | | |--- value: [8.00]  
| | | | | | | | | | | | |--- temp > 0.79  
| | | | | | | | | | | | |--- season <= -0.00  
| | | | | | | | | | | | |--- value: [50.00]  
| | | | | | | | | | | | |--- season > -0.00  
| | | | | | | | | | | | |--- atemp <= 1.60  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- atemp > 1.60  
| | | | | | | | | | | | |--- value: [24.00]  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- hum <= 1.34  
| | | | | | | | | | | | |--- weathersit <= 1.68
```

```
| | | | | | | | | |--- windspeed <= -0.46  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- windspeed > -0.46  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | |--- atemp <= 0.27  
| | | | | | | | |--- value: [16.00]  
| | | | | | | | |--- atemp > 0.27  
| | | | | | | | |--- value: [26.00]  
| | | | | | | |--- hum > 1.34  
| | | | | | | |--- value: [11.00]  
  
| |--- hr > -1.45  
| | |--- workingday <= -0.39  
| | | |--- hr <= -1.31  
| | | | |--- atemp <= -0.17  
| | | | |--- atemp <= -0.87  
| | | | |--- season <= 0.45  
| | | | |--- yr <= -0.01  
| | | | |--- mnth <= 0.43  
| | | | | |--- hum <= -0.71  
| | | | | |--- truncated branch of depth 2  
| | | | | |--- hum > -0.71  
| | | | | |--- truncated branch of depth 7  
| | | | |--- mnth > 0.43  
| | | | |--- value: [2.00]  
| | | |--- yr > -0.01  
| | | |--- mnth <= 0.28  
| | | |--- holiday <= 2.82  
| | | | |--- truncated branch of depth 8  
| | | | |--- holiday > 2.82  
| | | | |--- truncated branch of depth 2  
| | | |--- mnth > 0.28  
| | | |--- atemp <= -1.31  
| | | | |--- truncated branch of depth 3  
| | | |--- atemp > -1.31  
| | | | |--- value: [7.00]  
| | |--- season > 0.45  
| | |--- temp <= -1.07  
| | | |--- holiday <= 2.82  
| | | |--- temp <= -1.18  
| | | | |--- truncated branch of depth 5  
| | | |--- temp > -1.18  
| | | | |--- truncated branch of depth 3  
| | | |--- holiday > 2.82  
| | | |--- value: [18.00]  
| | |--- temp > -1.07  
| | |--- hum <= -0.43  
| | |--- atemp <= -1.05
```



```

| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- atemp > -1.05
| | | | | | | | | | | | |--- value: [46.00]
| | | | | | | | | | | | |--- hum > -0.43
| | | | | | | | | | | | |--- hum <= -0.19
| | | | | | | | | | | | |--- value: [11.00]
| | | | | | | | | | | | |--- hum > -0.19
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- atemp > -0.87
| | | | | | | | | | | | |--- holiday <= 2.82
| | | | | | | | | | | | |--- yr <= -0.01
| | | | | | | | | | | | |--- season <= -0.90
| | | | | | | | | | | | |--- atemp <= -0.34
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- atemp > -0.34
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- season > -0.90
| | | | | | | | | | | | |--- temp <= -0.45
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- temp > -0.45
| | | | | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | | | | |--- yr > -0.01
| | | | | | | | | | | | |--- hum <= 1.28
| | | | | | | | | | | | |--- hum <= -1.67
| | | | | | | | | | | | |--- value: [32.00]
| | | | | | | | | | | | |--- hum > -1.67
| | | | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | | | |--- hum > 1.28
| | | | | | | | | | | | |--- windspeed <= -1.19
| | | | | | | | | | | | |--- value: [42.00]
| | | | | | | | | | | | |--- windspeed > -1.19
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- holiday > 2.82
| | | | | | | | | | | | |--- atemp <= -0.61
| | | | | | | | | | | | |--- value: [15.00]
| | | | | | | | | | | | |--- atemp > -0.61
| | | | | | | | | | | | |--- windspeed <= -1.00
| | | | | | | | | | | | |--- value: [18.00]
| | | | | | | | | | | | |--- windspeed > -1.00
| | | | | | | | | | | | |--- value: [20.00]
| | | | | | | | | | | | |--- atemp > -0.17
| | | | | | | | | | | | |--- weekday <= -1.25
| | | | | | | | | | | | |--- yr <= -0.01
| | | | | | | | | | | | |--- hum <= 1.49
| | | | | | | | | | | | |--- hum <= 0.82
| | | | | | | | | | | | |--- season <= -0.00
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- season > -0.00

```

```
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- hum > 0.82  
| | | | | | | | |   |-- mnth <= 0.57  
| | | | | | | | |     |-- truncated branch of depth 5  
| | | | | | | | |       |-- mnth > 0.57  
| | | | | | | | |         |-- truncated branch of depth 2  
| | | | | | | | |           |-- hum > 1.49  
| | | | | | | | |             |-- value: [106.00]  
|--- yr > -0.01  
    |-- season <= -0.00  
        |-- mnth <= -0.59  
            |-- value: [56.00]  
                |-- mnth > -0.59  
                    |-- atemp <= 0.54  
                        |-- truncated branch of depth 3  
                            |-- atemp > 0.54  
                                |-- truncated branch of depth 2  
                                    --- season > -0.00  
                                        |-- weathersit <= 0.12  
                                            |-- temp <= 1.21  
                                                |-- truncated branch of depth 5  
                                                    |-- temp > 1.21  
                                                        |-- truncated branch of depth 2  
                                                            --- weathersit > 0.12  
                                                                |-- temp <= 0.69  
                                                                    |-- truncated branch of depth 3  
                                                                        |-- temp > 0.69  
                                                                            |-- truncated branch of depth 2  
                                                                                --- weekday > -1.25  
                                                                                    |-- weekday <= -0.50  
                                                                                        |-- hum <= 0.45  
                                                                                            |-- value: [14.00]  
                                                                                                |-- hum > 0.45  
                                                                                                    |-- windspeed <= -0.88  
                                                                                                        |-- value: [19.00]  
                                                                                                            |-- windspeed > -0.88  
                                                                                                                |-- temp <= 0.85  
                                                                                                                    |-- truncated branch of depth 2  
                                                                                                                                               |-- temp > 0.85  
                                                                                                                                                   |-- value: [39.00]  
|-- weekday > -0.50  
    |-- yr <= -0.01  
        |-- mnth <= 0.28  
            |-- atemp <= 1.20  
                |-- truncated branch of depth 5  
                    |-- atemp > 1.20  
                        |-- value: [42.00]  
                            |-- mnth > 0.28
```

```
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- value: [41.00]  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- mnth <= -0.01  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > -0.01  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hr > -1.31  
| | | | | | | | | |--- hr <= -1.16  
| | | | | | | | | |--- temp <= -0.87  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- season <= 0.45  
| | | | | | | | | |--- hum <= -0.92  
| | | | | | | | | |--- value: [18.00]  
| | | | | | | | | |--- hum > -0.92  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- season > 0.45  
| | | | | | | | | |--- atemp <= -1.23  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- atemp > -1.23  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- atemp <= -1.05  
| | | | | | | | | |--- mnth <= -1.47  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- mnth > -1.47  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- atemp > -1.05  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- value: [46.00]  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- hum <= -0.37  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- value: [3.00]  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- value: [2.00]  
| | | | | | | | | |--- hum > -0.37
```

```
| | | | | | | | | | | | |--- hum <= 0.79  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- value: [6.00]  
| | | | | | | | | | | | |--- hum > 0.79  
| | | | | | | | | | | | |--- value: [8.00]  
| | | | | | | | | | | | |--- temp > -0.87  
| | | | | | | | | | | | |--- weekday <= -1.25  
| | | | | | | | | | | | |--- season <= -0.00  
| | | | | | | | | | | | |--- hum <= 0.04  
| | | | | | | | | | | | |--- atemp <= -0.08  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- atemp > -0.08  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- hum > 0.04  
| | | | | | | | | | | | |--- mnth <= -0.88  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- mnth > -0.88  
| | | | | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | | | | |--- season > -0.00  
| | | | | | | | | | | | |--- windspeed <= 1.01  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | | | | |--- windspeed > 1.01  
| | | | | | | | | | | | |--- value: [79.00]  
| | | | | | | | | | | | |--- weekday > -1.25  
| | | | | | | | | | | | |--- temp <= -0.14  
| | | | | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | | |--- yr > -0.01  
| | | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | | | | |--- hum <= 0.82  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- hum > 0.82  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- temp > -0.14  
| | | | | | | | | | | | |--- weekday <= -0.50  
| | | | | | | | | | | | |--- windspeed <= -0.33  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- windspeed > -0.33  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- weekday > -0.50  
| | | | | | | | | | | | |--- mnth <= 0.57
```

```
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- mnth > 0.57  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |---- hr > -1.16  
| | | | | | | | | |--- temp <= -0.14  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- hum <= 0.61  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- hum > 0.61  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- hum <= 0.58  
| | | | | | | | | |--- value: [1.00]  
| | | | | | | | | |--- hum > 0.58  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |---- yr > -0.01  
| | | | | | | | | |--- windspeed <= 0.83  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |---- windspeed > 0.83  
| | | | | | | | | |--- temp <= -1.91  
| | | | | | | | | |--- value: [1.00]  
| | | | | | | | | |--- temp > -1.91  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |---- season > -0.90  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- atemp <= -0.43  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |---- atemp > -0.43  
| | | | | | | | | |--- windspeed <= -0.58  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- windspeed > -0.58  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |---- yr > -0.01  
| | | | | | | | | |--- hum <= -0.76  
| | | | | | | | | |--- temp <= -0.71  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- temp > -0.71  
| | | | | | | | | |--- value: [12.00]  
| | | | | | | | | |--- hum > -0.76  
| | | | | | | | | |--- temp <= -1.18
```

[illegible]

```
| | | | | | | | | |--- mnth > -0.45  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | |--- workingday > -0.39  
| | | | |--- hr <= -1.02  
| | | | |--- hr <= -1.31  
| | | | |--- temp <= -0.35  
| | | | |--- atemp <= -1.31  
| | | | |--- temp <= -1.80  
| | | | |--- weekday <= -0.75  
| | | | |--- hum <= -0.76  
| | | | |--- value: [4.00]  
| | | | |--- hum > -0.76  
| | | | |--- value: [3.00]  
| | | | |--- weekday > -0.75  
| | | | |--- mnth <= -1.47  
| | | | |--- truncated branch of depth 2  
| | | | |--- mnth > -1.47  
| | | | |--- truncated branch of depth 3  
| | | | |--- temp > -1.80  
| | | | |--- mnth <= 1.44  
| | | | |--- temp <= -1.59  
| | | | |--- truncated branch of depth 3  
| | | | |--- temp > -1.59  
| | | | |--- truncated branch of depth 8  
| | | | |--- mnth > 1.44  
| | | | |--- hum <= -0.01  
| | | | |--- truncated branch of depth 4  
| | | | |--- hum > -0.01  
| | | | |--- truncated branch of depth 2  
| | | | |--- atemp > -1.31  
| | | | |--- windspeed <= 0.83  
| | | | |--- weekday <= 0.75  
| | | | |--- temp <= -0.45  
| | | | |--- truncated branch of depth 13  
| | | | |--- temp > -0.45  
| | | | |--- truncated branch of depth 6  
| | | | |--- weekday > 0.75  
| | | | |--- hum <= 0.71  
| | | | |--- truncated branch of depth 7  
| | | | |--- hum > 0.71  
| | | | |--- truncated branch of depth 5  
| | | | |--- windspeed > 0.83  
| | | | |--- atemp <= -1.14  
| | | | |--- value: [74.00]  
| | | | |--- atemp > -1.14  
| | | | |--- weekday <= 0.25  
| | | | |--- truncated branch of depth 4  
| | | | |--- weekday > 0.25
```



```
| | | | | | | | | |--- temp <= -0.87  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- atemp <= -1.58  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- atemp > -1.58  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- mnth <= -1.47  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- mnth > -1.47  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- temp > -0.87  
| | | | | | | | | |--- hr <= -1.16  
| | | | | | | | | |--- hum <= 0.07  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > 0.07  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- hr > -1.16  
| | | | | | | | | |--- hum <= 1.78  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- hum > 1.78  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- temp > -0.35  
| | | | | | | | | |--- atemp <= 0.01  
| | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | |--- weekday <= -0.75  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- weekday > -0.75  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | |--- hum <= 0.61  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > 0.61  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- atemp > 0.01  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- windspeed <= 0.64  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- windspeed > 0.64  
| | | | | | | | | |--- value: [21.00]  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- value: [2.00]  
| | | | | | | | | |--- mnth > -0.59  
| | | | | | | | | |--- yr <= -0.01  
| | | | | | | | | |--- mnth <= 1.15
```

```
| | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | |--- weekday <= 0.75  
| | | | | | | | |   |--- truncated branch of depth 14  
| | | | | | | | |--- weekday > 0.75  
| | | | | | | | |   |--- truncated branch of depth 10  
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | |   |--- season <= 0.90  
| | | | | | | | |     |--- truncated branch of depth 7  
| | | | | | | | |     |--- season > 0.90  
| | | | | | | | |       |--- truncated branch of depth 5  
| | | | | | | | |--- mnth > 1.15  
| | | | | | | | |   |--- temp <= -0.87  
| | | | | | | | |     |--- windspeed <= 0.64  
| | | | | | | | |       |--- truncated branch of depth 8  
| | | | | | | | |       |--- windspeed > 0.64  
| | | | | | | | |         |--- truncated branch of depth 2  
| | | | | | | | |         |--- temp > -0.87  
| | | | | | | | |           |--- windspeed <= -1.19  
| | | | | | | | |             |--- value: [2.00]  
| | | | | | | | |             |--- windspeed > -1.19  
| | | | | | | | |               |--- truncated branch of depth 9  
| | | | | | | | |--- yr > -0.01  
| | | | | | | | |   |--- weekday <= 0.75  
| | | | | | | | |   |--- hr <= -1.16  
| | | | | | | | |     |--- weekday <= -0.25  
| | | | | | | | |       |--- truncated branch of depth 10  
| | | | | | | | |       |--- weekday > -0.25  
| | | | | | | | |         |--- truncated branch of depth 14  
| | | | | | | | |         |--- hr > -1.16  
| | | | | | | | |           |--- hum <= 0.09  
| | | | | | | | |             |--- truncated branch of depth 7  
| | | | | | | | |             |--- hum > 0.09  
| | | | | | | | |               |--- truncated branch of depth 18  
| | | | | | | | |--- weekday > 0.75  
| | | | | | | | |   |--- temp <= -0.97  
| | | | | | | | |     |--- atemp <= -1.40  
| | | | | | | | |       |--- truncated branch of depth 2  
| | | | | | | | |       |--- atemp > -1.40  
| | | | | | | | |         |--- truncated branch of depth 5  
| | | | | | | | |         |--- temp > -0.97  
| | | | | | | | |           |--- season <= -0.90  
| | | | | | | | |             |--- truncated branch of depth 2  
| | | | | | | | |             |--- season > -0.90  
| | | | | | | | |               |--- truncated branch of depth 11  
| | | | | | | | |--- hr > -1.02  
| | | | | | | | |   |--- yr <= -0.01  
| | | | | | | | |     |--- mnth <= -0.59  
| | | | | | | | |       |--- mnth <= -0.88
```

```
| | | | | | | | |--- windspeed <= 0.64
| | | | | | | | |--- mnth <= -1.17
| | | | | | | | |    |--- atemp <= -1.31
| | | | | | | | |    |    |--- truncated branch of depth 5
| | | | | | | | |    |    |--- atemp > -1.31
| | | | | | | | |    |    |    |--- truncated branch of depth 3
| | | | | | | | |    |--- mnth > -1.17
| | | | | | | | |    |    |--- hum <= -2.29
| | | | | | | | |    |    |    |--- value: [3.00]
| | | | | | | | |    |    |    |--- hum > -2.29
| | | | | | | | |    |    |    |    |--- truncated branch of depth 7
| | | | | | | | |--- windspeed > 0.64
| | | | | | | | |    |--- mnth <= -1.47
| | | | | | | | |    |    |--- hum <= -0.04
| | | | | | | | |    |    |    |--- truncated branch of depth 2
| | | | | | | | |    |    |    |--- hum > -0.04
| | | | | | | | |    |    |    |    |--- value: [8.00]
| | | | | | | | |    |--- mnth > -1.47
| | | | | | | | |    |    |--- windspeed <= 1.80
| | | | | | | | |    |    |    |--- truncated branch of depth 3
| | | | | | | | |    |    |    |--- windspeed > 1.80
| | | | | | | | |    |    |    |    |--- value: [4.00]
| | | | | | | | |--- mnth > -0.88
| | | | | | | | |    |--- hum <= -0.66
| | | | | | | | |    |    |--- value: [25.00]
| | | | | | | | |    |--- hum > -0.66
| | | | | | | | |    |    |--- windspeed <= 0.15
| | | | | | | | |    |    |    |--- atemp <= -0.65
| | | | | | | | |    |    |    |    |--- value: [9.00]
| | | | | | | | |    |    |    |--- atemp > -0.65
| | | | | | | | |    |    |    |    |--- truncated branch of depth 4
| | | | | | | | |    |--- windspeed > 0.15
| | | | | | | | |    |    |--- hum <= -0.24
| | | | | | | | |    |    |    |--- truncated branch of depth 2
| | | | | | | | |    |    |    |--- hum > -0.24
| | | | | | | | |    |    |    |    |--- truncated branch of depth 5
| | | | | | | | |--- mnth > -0.59
| | | | | | | | |    |--- season <= -0.90
| | | | | | | | |    |    |--- windspeed <= -1.19
| | | | | | | | |    |    |    |--- value: [16.00]
| | | | | | | | |    |--- windspeed > -1.19
| | | | | | | | |    |    |--- temp <= -1.23
| | | | | | | | |    |    |    |--- value: [10.00]
| | | | | | | | |    |--- temp > -1.23
| | | | | | | | |    |    |--- windspeed <= 1.07
| | | | | | | | |    |    |    |--- value: [8.00]
| | | | | | | | |    |    |--- windspeed > 1.07
| | | | | | | | |    |    |    |--- value: [9.00]
```

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```
| | | | | | | | | |--- atemp <= -1.49  
| | | | | | | | | |--- value: [5.00]  
| | | | | | | | | |--- atemp > -1.49  
| | | | | | | | | |--- value: [4.00]  
  
| | | | | | | | | |--- atemp > -1.05  
| | | | | | | | | |--- weekday <= -1.25  
| | | | | | | | | |--- value: [2.00]  
| | | | | | | | | |--- weekday > -1.25  
| | | | | | | | | |--- atemp <= -0.70  
| | | | | | | | | |--- value: [10.00]  
| | | | | | | | | |--- atemp > -0.70  
| | | | | | | | | |--- atemp <= -0.34  
| | | | | | | | | |--- value: [6.00]  
| | | | | | | | | |--- atemp > -0.34  
| | | | | | | | | |--- hum <= -1.44  
| | | | | | | | | |--- value: [8.00]  
| | | | | | | | | |--- hum > -1.44  
| | | | | | | | | |--- value: [10.00]  
  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- atemp <= -0.34  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- weekday <= -0.00  
| | | | | | | | | |--- mnth <= -1.17  
| | | | | | | | | |--- atemp <= -1.98  
| | | | | | | | | |--- value: [8.00]  
| | | | | | | | | |--- atemp > -1.98  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- mnth > -1.17  
| | | | | | | | | |--- hum <= -0.24  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hum > -0.24  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- weekday > -0.00  
| | | | | | | | | |--- atemp <= -1.27  
| | | | | | | | | |--- temp <= -1.33  
| | | | | | | | | |--- value: [5.00]  
| | | | | | | | | |--- temp > -1.33  
| | | | | | | | | |--- value: [7.00]  
| | | | | | | | | |--- atemp > -1.27  
| | | | | | | | | |--- hum <= 0.51  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 0.51  
| | | | | | | | | |--- value: [7.00]  
  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- value: [1.00]  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- mnth <= -1.47
```

```
| | | | | | | | |--- atemp <= -1.71  
| | | | | | | | |--- value: [13.00]  
| | | | | | | | |--- atemp > -1.71  
| | | | | | | | |--- value: [14.00]  
| | | | | | | | |--- mnth > -1.47  
| | | | | | | | |--- temp <= -1.39  
| | | | | | | | |--- value: [7.00]  
| | | | | | | | |--- temp > -1.39  
| | | | | | | | |--- value: [10.00]  
| | | | | | | | |--- atemp > -0.34  
| | | | | | | | |--- value: [30.00]  
| | | | | | | | |--- season > -0.90  
| | | | | | | | |--- yr <= -0.01  
| | | | | | | | |--- atemp <= 0.54  
| | | | | | | | |--- hum <= -0.63  
| | | | | | | | |--- value: [46.00]  
| | | | | | | | |--- hum > -0.63  
| | | | | | | | |--- windspeed <= -1.19  
| | | | | | | | |--- holiday <= 2.82  
| | | | | | | | |--- weekday <= -0.00  
| | | | | | | | |--- temp <= -0.14  
| | | | | | | | |--- value: [6.00]  
| | | | | | | | |--- temp > -0.14  
| | | | | | | | |--- value: [13.00]  
| | | | | | | | |--- weekday > -0.00  
| | | | | | | | |--- temp <= -0.14  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- temp > -0.14  
| | | | | | | | |--- value: [28.00]  
| | | | | | | | |--- holiday > 2.82  
| | | | | | | | |--- value: [44.00]  
| | | | | | | | |--- windspeed > -1.19  
| | | | | | | | |--- temp <= -1.44  
| | | | | | | | |--- mnth <= 0.28  
| | | | | | | | |--- value: [2.00]  
| | | | | | | | |--- mnth > 0.28  
| | | | | | | | |--- value: [3.00]  
| | | | | | | | |--- temp > -1.44  
| | | | | | | | |--- windspeed <= -0.76  
| | | | | | | | |--- season <= -0.00  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- season > -0.00  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- windspeed > -0.76  
| | | | | | | | |--- temp <= 0.69  
| | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- temp > 0.69  
| | | | | | | | |--- value: [6.00]
```


[illegible]

```
| | | | | | | | |--- hum <= -0.45  
| | | | | | | | |--- value: [11.00]  
| | | | | | | | |--- hum > -0.45  
| | | | | | | | |--- windspeed <= -0.64  
| | | | | | | | |--- value: [19.00]  
| | | | | | | | |--- windspeed > -0.64  
| | | | | | | | |--- windspeed <= -0.33  
| | | | | | | | |--- value: [16.00]  
| | | | | | | | |--- windspeed > -0.33  
| | | | | | | | |--- value: [15.00]  
| | | | | | | | |--- temp > -0.92  
| | | | | | | | |--- windspeed <= -1.00  
| | | | | | | | |--- value: [6.00]  
| | | | | | | | |--- windspeed > -1.00  
| | | | | | | | |--- value: [7.00]  
| | | | | | | | |--- weekday > -0.00  
| | | | | | | | |--- windspeed <= 0.52  
| | | | | | | | |--- windspeed <= -0.64  
| | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | |--- value: [16.00]  
| | | | | | | | |--- weathersit > 0.12  
| | | | | | | | |--- value: [11.00]  
| | | | | | | | |--- windspeed > -0.64  
| | | | | | | | |--- temp <= -0.97  
| | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- windspeed > 0.15  
| | | | | | | | |--- value: [21.00]  
| | | | | | | | |--- temp > -0.97  
| | | | | | | | |--- hum <= -1.05  
| | | | | | | | |--- value: [19.00]  
| | | | | | | | |--- hum > -1.05  
| | | | | | | | |--- value: [21.00]  
| | | | | | | | |--- windspeed > 0.52  
| | | | | | | | |--- value: [10.00]  
| | | | | | | | |--- temp > -0.76  
| | | | | | | | |--- weekday <= -1.25  
| | | | | | | | |--- atemp <= -0.65  
| | | | | | | | |--- value: [97.00]  
| | | | | | | | |--- atemp > -0.65  
| | | | | | | | |--- hum <= 1.03  
| | | | | | | | |--- windspeed <= 0.83  
| | | | | | | | |--- windspeed <= -1.19  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- windspeed > -1.19  
| | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | |--- windspeed > 0.83  
| | | | | | | | |--- value: [39.00]
```

```
| | | | | | | | --- hum > 1.03  
| | | | | | | | |--- season <= 0.90  
| | | | | | | | |   |--- temp <= 0.74  
| | | | | | | | |     |--- truncated branch of depth 4  
| | | | | | | | |       |--- temp > 0.74  
| | | | | | | | |         |--- value: [15.00]  
| | | | | | | | |           |--- season > 0.90  
| | | | | | | | |             |--- value: [6.00]  
| | | | | | | | |               |--- weekday > -1.25  
| | | | | | | | |                 |--- weathersit <= 0.12  
| | | | | | | | |                   |--- temp <= -0.50  
| | | | | | | | |                     |--- value: [71.00]  
| | | | | | | | |                       |--- temp > -0.50  
| | | | | | | | |                         |--- weekday <= 0.25  
| | | | | | | | |                           |--- windspeed <= -0.88  
| | | | | | | | |                             |--- value: [15.00]  
| | | | | | | | |                               |--- windspeed > -0.88  
| | | | | | | | |                                 |--- value: [20.00]  
| | | | | | | | |                                   |--- weekday > 0.25  
| | | | | | | | |                                     |--- hum <= 0.40  
| | | | | | | | |                                       |--- truncated branch of depth 4  
| | | | | | | | |                                           |--- hum > 0.40  
| | | | | | | | |                                             |--- truncated branch of depth 6  
| | | | | | | | |                                               |--- weathersit > 0.12  
| | | | | | | | |                                                 |--- hum <= 1.15  
| | | | | | | | |                                                     |--- hum <= 0.90  
| | | | | | | | |                                                         |--- mnth <= 0.28  
| | | | | | | | |                                                             |--- truncated branch of depth 2  
| | | | | | | | |                                                                 |--- mnth > 0.28  
| | | | | | | | |                                                                     |--- value: [30.00]  
| | | | | | | | |                                                                         |--- hum > 0.90  
| | | | | | | | |                                                                             |--- hum <= 1.03  
| | | | | | | | |                                                                                 |--- value: [31.00]  
| | | | | | | | |                                                                                                         |--- hum > 1.03  
| | | | | | | | |                                                                                                             |--- value: [28.00]  
| | | | | | | | |                                                                       |--- hum > 1.15  
| | | | | | | | |                                                                           |--- temp <= 0.74  
| | | | | | | | |                                                                               |--- weathersit <= 1.68  
| | | | | | | | |                                                                                   |--- truncated branch of depth 2  
| | | | | | | | |                                                                                       |--- weathersit > 1.68  
| | | | | | | | |                                                                                           |--- value: [15.00]  
| | | | | | | | |                                                                                                |--- temp > 0.74  
| | | | | | | | |                                                                                                    |--- value: [34.00]  
  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |   |--- season <= -0.90  
| | | | | | | | | |     |--- yr <= -0.01  
| | | | | | | | | |       |--- atemp <= -0.65  
| | | | | | | | | |         |--- weathersit <= 1.68
```



```
| | | | | | --- atemp > -0.65  
| | | | | | |--- temp <= -0.66  
| | | | | | |    |-- weekday <= 0.25  
| | | | | | |        |-- value: [76.00]  
| | | | | | |    |-- weekday > 0.25  
| | | | | | |        |-- value: [64.00]  
| | | | | | |--- temp > -0.66  
| | | | | | |    |-- temp <= -0.40  
| | | | | | |        |-- mnth <= 0.28  
| | | | | | |            |-- value: [36.00]  
| | | | | | |        |-- mnth > 0.28  
| | | | | | |            |-- value: [40.00]  
| | | | | | |    |-- temp > -0.40  
| | | | | | |        |-- value: [50.00]  
| | | | | | --- yr > -0.01  
| | | | | | |    |-- mnth <= 0.28  
| | | | | | |        |-- mnth <= -1.17  
| | | | | | |            |-- temp <= -1.49  
| | | | | | |                |-- weekday <= -0.75  
| | | | | | |                    |-- weathersit <= 0.12  
| | | | | | |                        |-- value: [72.00]  
| | | | | | |                    |-- weathersit > 0.12  
| | | | | | |                        |-- value: [42.00]  
| | | | | | |                |-- weekday > -0.75  
| | | | | | |                    |-- hum <= -0.79  
| | | | | | |                        |-- value: [59.00]  
| | | | | | |                    |-- hum > -0.79  
| | | | | | |                        |-- weekday <= 0.75  
| | | | | | |                            |-- truncated branch of depth 5  
| | | | | | |                                |-- weekday > 0.75  
| | | | | | |                                    |-- value: [64.00]  
| | | | | | |            |-- temp > -1.49  
| | | | | | |                |-- weekday <= 0.75  
| | | | | | |                    |-- weathersit <= 1.68  
| | | | | | |                        |-- atemp <= -1.49  
| | | | | | |                            |-- value: [80.00]  
| | | | | | |                        |-- atemp > -1.49  
| | | | | | |                            |-- truncated branch of depth 6  
| | | | | | |                                |-- weathersit > 1.68  
| | | | | | |                                    |-- hum <= 1.49  
| | | | | | |                                        |-- truncated branch of depth 3  
| | | | | | |                                            |-- hum > 1.49  
| | | | | | |                                                |-- value: [89.00]  
| | | | | | |            |-- weekday > 0.75  
| | | | | | |                |-- mnth <= -1.47  
| | | | | | |                    |-- hum <= 0.58  
| | | | | | |                        |-- truncated branch of depth 2  
| | | | | | |                            |-- hum > 0.58
```

```
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > -1.47  
| | | | | | | | | |   |--- hum <= 1.49  
| | | | | | | | | |   |   |--- truncated branch of depth 2  
| | | | | | | | | |   |   |--- hum > 1.49  
| | | | | | | | | |   |   |   |--- value: [71.00]  
| | | | | | | | | |--- mnth > -1.17  
| | | | | | | | | |   |--- atemp <= -0.34  
| | | | | | | | | |     |--- windspeed <= -0.33  
| | | | | | | | | |       |--- temp <= -0.92  
| | | | | | | | | |         |--- hum <= 0.09  
| | | | | | | | | |           |--- value: [91.00]  
| | | | | | | | | |           |--- hum > 0.09  
| | | | | | | | | |             |--- value: [92.00]  
| | | | | | | | | |               |--- temp > -0.92  
| | | | | | | | | |                 |--- value: [88.00]  
| | | | | | | | | |                   |--- windspeed > -0.33  
| | | | | | | | | |                     |--- weekday <= 0.50  
| | | | | | | | | |                       |--- value: [108.00]  
| | | | | | | | | |                         |--- weekday > 0.50  
| | | | | | | | | |                           |--- value: [99.00]  
| | | | | | | | | |                             |--- atemp > -0.34  
| | | | | | | | | |                               |--- temp <= -0.04  
| | | | | | | | | |                                 |--- atemp <= -0.26  
| | | | | | | | | |                                   |--- value: [109.00]  
| | | | | | | | | |                                     |--- atemp > -0.26  
| | | | | | | | | |                                       |--- windspeed <= -0.21  
| | | | | | | | | |                                           |--- truncated branch of depth 2  
| | | | | | | | | |                                             |--- windspeed > -0.21  
| | | | | | | | | |                                               |--- value: [113.00]  
| | | | | | | | | |                                                 |--- temp > -0.04  
| | | | | | | | | |                                                   |--- value: [100.00]  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |   |--- atemp <= -1.18  
| | | | | | | | | |     |--- weekday <= -0.50  
| | | | | | | | | |       |--- value: [17.00]  
| | | | | | | | | |         |--- weekday > -0.50  
| | | | | | | | | |           |--- weekday <= 0.25  
| | | | | | | | | |             |--- value: [36.00]  
| | | | | | | | | |               |--- weekday > 0.25  
| | | | | | | | | |                 |--- hum <= 0.22  
| | | | | | | | | |                   |--- value: [51.00]  
| | | | | | | | | |                     |--- hum > 0.22  
| | | | | | | | | |                       |--- value: [45.00]  
| | | | | | | | | |                             |--- atemp > -1.18  
| | | | | | | | | |                               |--- value: [80.00]  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- yr <= -0.01
```

[illegible]

```
| | | | | | | | --- weekday > -0.25  
| | | | | | | | |--- atemp <= 0.18  
| | | | | | | | |   |--- weekday <= 0.25  
| | | | | | | | |   |   |--- value: [64.00]  
| | | | | | | | |   |   |--- weekday > 0.25  
| | | | | | | | |   |   |--- windspeed <= 1.98  
| | | | | | | | |   |   |   |--- value: [71.00]  
| | | | | | | | |   |   |   |--- windspeed > 1.98  
| | | | | | | | |   |   |   |   |--- value: [75.00]  
| | | | | | | | |   |--- atemp > 0.18  
| | | | | | | | |       |--- value: [84.00]  
| | | | | | | | |--- mnth > -0.59  
| | | | | | | | |   |--- weathersit <= 1.68  
| | | | | | | | |   |   |--- temp <= -0.09  
| | | | | | | | |   |   |   |--- atemp <= -1.14  
| | | | | | | | |   |   |   |   |--- weekday <= 0.75  
| | | | | | | | |   |   |   |   |   |--- temp <= -1.39  
| | | | | | | | |   |   |   |   |   |   |--- truncated branch of depth 4  
| | | | | | | | |   |   |   |   |   |   |--- temp > -1.39  
| | | | | | | | |   |   |   |   |   |   |   |--- truncated branch of depth 2  
| | | | | | | | |   |   |   |   |   |   |   |--- weekday > 0.75  
| | | | | | | | |   |   |   |   |   |   |   |   |--- hum <= 0.92  
| | | | | | | | |   |   |   |   |   |   |   |   |   |--- truncated branch of depth 4  
| | | | | | | | |   |   |   |   |   |   |   |   |   |--- hum > 0.92  
| | | | | | | | |   |   |   |   |   |   |   |   |   |   |--- value: [13.00]  
| | | | | | | | |   |--- atemp > -1.14  
| | | | | | | | |   |   |--- weathersit <= 0.12  
| | | | | | | | |   |   |   |--- weekday <= -0.75  
| | | | | | | | |   |   |   |   |--- truncated branch of depth 4  
| | | | | | | | |   |   |   |   |--- weekday > -0.75  
| | | | | | | | |   |   |   |   |   |--- truncated branch of depth 7  
| | | | | | | | |   |   |   |   |   |--- weathersit > 0.12  
| | | | | | | | |   |   |   |   |   |   |--- windspeed <= -0.58  
| | | | | | | | |   |   |   |   |   |   |   |--- truncated branch of depth 5  
| | | | | | | | |   |   |   |   |   |   |   |--- windspeed > -0.58  
| | | | | | | | |   |   |   |   |   |   |   |   |--- truncated branch of depth 3  
| | | | | | | | |   |--- temp > -0.09  
| | | | | | | | |   |   |--- weekday <= 0.75  
| | | | | | | | |   |   |   |--- windspeed <= 0.64  
| | | | | | | | |   |   |   |   |--- weekday <= -0.75  
| | | | | | | | |   |   |   |   |   |--- truncated branch of depth 7  
| | | | | | | | |   |   |   |   |   |--- weekday > -0.75  
| | | | | | | | |   |   |   |   |   |   |--- truncated branch of depth 10  
| | | | | | | | |   |   |   |   |   |   |--- windspeed > 0.64  
| | | | | | | | |   |   |   |   |   |   |--- mnth <= 0.57  
| | | | | | | | |   |   |   |   |   |   |   |--- truncated branch of depth 6  
| | | | | | | | |   |   |   |   |   |   |   |--- mnth > 0.57  
| | | | | | | | |   |   |   |   |   |   |   |   |--- truncated branch of depth 2
```



```
| | | | | | | | |--- weekday > 0.75  
| | | | | | | | |--- hum <= 1.52  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- hum > 1.52  
| | | | | | | | |--- value: [57.00]  
| | | | | | | |--- weathersit > 1.68  
| | | | | | | |--- hum <= 0.66  
| | | | | | | |--- season <= 0.90  
| | | | | | | |--- windspeed <= 1.13  
| | | | | | | | |--- value: [112.00]  
| | | | | | | |--- windspeed > 1.13  
| | | | | | | | |--- value: [110.00]  
| | | | | | | |--- season > 0.90  
| | | | | | | |--- value: [75.00]  
| | | | | | | |--- hum > 0.66  
| | | | | | | |--- weekday <= 0.75  
| | | | | | | |--- windspeed <= -0.58  
| | | | | | | | |--- temp <= 0.28  
| | | | | | | | | |--- value: [46.00]  
| | | | | | | | |--- temp > 0.28  
| | | | | | | | | |--- value: [75.00]  
| | | | | | | |--- windspeed > -0.58  
| | | | | | | |--- atemp <= 0.05  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | |--- atemp > 0.05  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- weekday > 0.75  
| | | | | | | |--- atemp <= 0.18  
| | | | | | | | |--- value: [82.00]  
| | | | | | | |--- atemp > 0.18  
| | | | | | | | |--- value: [94.00]  
| | | | | | |--- yr > -0.01  
| | | | | | |--- weathersit <= 1.68  
| | | | | | |--- temp <= -0.35  
| | | | | | |--- temp <= -0.87  
| | | | | | |--- hum <= 0.92  
| | | | | | |--- mnth <= 0.28  
| | | | | | | |--- weekday <= 0.25  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- weekday > 0.25  
| | | | | | | | |--- truncated branch of depth 4  
| | | | | | | |--- mnth > 0.28  
| | | | | | | |--- hum <= 0.51  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | |--- hum > 0.51
```

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[illegible]


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| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hum > -0.53  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- hr > -0.30  
| | | | | | | | |--- season <= -0.90  
| | | | | | | | |--- hr <= 0.72  
| | | | | | | | |--- atemp <= -1.05  
| | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | |--- atemp > -1.05  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- hr > 0.72  
| | | | | | | | |--- mnth <= -1.17  
| | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | |--- mnth > -1.17  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- season > -0.90  
| | | | | | | | |--- hum <= -1.26  
| | | | | | | | |--- weekday <= -0.00  
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- weekday > -0.00  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- hum > -1.26  
| | | | | | | | |--- temp <= -1.28  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- temp > -1.28  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | |--- workingday > -0.39  
| | | | | | | |--- hr <= -0.30  
| | | | | | | |--- hr <= -0.59  
| | | | | | | |--- weathersit <= 1.68  
| | | | | | | |--- mnth <= -1.17  
| | | | | | | |--- truncated branch of depth 9  
| | | | | | | |--- mnth > -1.17  
| | | | | | | |--- truncated branch of depth 9  
| | | | | | | |--- weathersit > 1.68  
| | | | | | | |--- mnth <= -0.88  
| | | | | | | |--- truncated branch of depth 4  
| | | | | | | |--- mnth > -0.88  
| | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- hr > -0.59  
| | | | | | | |--- hr <= -0.44  
| | | | | | | |--- weathersit <= 1.68  
| | | | | | | |--- truncated branch of depth 13  
| | | | | | | |--- weathersit > 1.68  
| | | | | | | |--- truncated branch of depth 4  
| | | | | | | |--- hr > -0.44  
| | | | | | | |--- hum <= 1.08  
| | | | | | | |--- truncated branch of depth 9
```

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| | | | | | | | | |--- hum > 1.08  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- hr > -0.30  
| | | | | | | | | |--- hr <= 0.72  
| | | | | | | | | |--- atemp <= -1.23  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- atemp > -1.23  
| | | | | | | | | |--- hum <= 0.40  
| | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | |--- hum > 0.40  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- hum <= 1.41  
| | | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | | |--- hum > 1.41  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > 1.01  
| | | | | | | | | |--- hum <= 1.41  
| | | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | | |--- hum > 1.41  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |--- atemp > -0.78  
| | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | |--- hr <= 0.72  
| | | | | | | | |--- mnth <= -0.88  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- hr > -0.59  
| | | | | | | | |--- hum <= 0.84  
| | | | | | | | |--- truncated branch of depth 18  
| | | | | | | | |--- hum > 0.84  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- mnth > -0.88  
| | | | | | | | |--- hum <= -1.44  
| | | | | | | | |--- hr <= 0.43  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- hr > 0.43  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- hum > -1.44  
| | | | | | | | |--- hum <= 1.47  
| | | | | | | | |--- truncated branch of depth 13
```

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| | | | | | | | | |--- hum > 1.47  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- hum <= -0.71  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- hum > -0.71  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- hr <= 0.86  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hr > 0.86  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- hr > 1.01  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > 1.01  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- hr <= 0.72  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- hr <= 0.57  
| | | | | | | | | |--- temp <= -0.66  
| | | | | | | | | |--- value: [59.00]  
| | | | | | | | | |--- temp > -0.66  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- hr > 0.57  
| | | | | | | | | |--- windspeed <= 0.64  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- windspeed > 0.64  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | | |--- value: [164.00]  
| | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | |--- windspeed <= 0.70  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- windspeed > 0.70  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- season <= -0.90
```

[illegible]


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| | | | | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- weathersit > 1.68
| | | | | | | | | | | | |--- temp <= -0.82
| | | | | | | | | | | | |--- value: [55.00]
| | | | | | | | | | | | |--- temp > -0.82
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- season > -0.90
| | | | | | | | | | | | |--- mnth <= -0.59
| | | | | | | | | | | | |--- atemp <= -0.70
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- atemp > -0.70
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- mnth > -0.59
| | | | | | | | | | | | |--- windspeed <= 0.46
| | | | | | | | | | | | |--- value: [150.00]
| | | | | | | | | | | | |--- windspeed > 0.46
| | | | | | | | | | | | |--- value: [191.00]
| | | | | | | | | | | | |--- hr > 1.44
| | | | | | | | | | | | |--- temp <= -0.76
| | | | | | | | | | | | |--- hr <= 1.58
| | | | | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | | | | |--- atemp <= -1.36
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- atemp > -1.36
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- temp <= -1.80
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- temp > -1.80
| | | | | | | | | | | | |--- truncated branch of depth 11
| | | | | | | | | | | | |--- hr > 1.58
| | | | | | | | | | | | |--- atemp <= -1.40
| | | | | | | | | | | | |--- weekday <= -0.75
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- weekday > -0.75
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- atemp > -1.40
| | | | | | | | | | | | |--- weekday <= 0.25
| | | | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | | | |--- weekday > 0.25
| | | | | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | | | | | |--- temp > -0.76
| | | | | | | | | | | | |--- weathersit <= 1.68
| | | | | | | | | | | | |--- weekday <= 0.25
| | | | | | | | | | | | |--- hum <= -0.14
| | | | | | | | | | | | |--- truncated branch of depth 4

```

[illegible]

[illegible]

```
| | | | | | | | |--- temp > -0.76  
| | | | | | | | |--- hr <= -0.44  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- hr > -0.44  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- hum > 0.71  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- hr <= -0.30  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- hr > -0.59  
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- hr > -0.30  
| | | | | | | | |--- weekday <= -0.00  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- weekday > -0.00  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- hr <= -0.44  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- hr > -0.59  
| | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | |--- hr > -0.44  
| | | | | | | | |--- hr <= -0.30  
| | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- hr > -0.30  
| | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |--- hr > 0.57  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- hr <= 0.86  
| | | | | | | | |--- temp <= -0.97  
| | | | | | | | |--- hr <= 0.72  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- hr > 0.72  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- temp > -0.97  
| | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- weathersit > 0.12  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- hr > 0.86
```

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| | | | | | | | |--- temp <= -0.35  
| | | | | | | | |--- temp <= -1.28  
| | | | | | | | |   |--- truncated branch of depth 2  
| | | | | | | | |   |--- temp > -1.28  
| | | | | | | | |   |   |--- truncated branch of depth 8  
| | | | | | | | |--- temp > -0.35  
| | | | | | | | |   |--- windspeed <= -1.19  
| | | | | | | | |   |   |--- value: [220.00]  
| | | | | | | | |   |--- windspeed > -1.19  
| | | | | | | | |   |   |--- value: [335.00]  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |   |--- hr <= 1.01  
| | | | | | | | |       |--- hr <= 0.72  
| | | | | | | | |           |--- weekday <= 0.75  
| | | | | | | | |           |   |--- truncated branch of depth 5  
| | | | | | | | |           |   |--- weekday > 0.75  
| | | | | | | | |           |       |--- truncated branch of depth 4  
| | | | | | | | |--- hr > 0.72  
| | | | | | | | |   |--- windspeed <= 2.47  
| | | | | | | | |   |   |--- truncated branch of depth 8  
| | | | | | | | |   |   |--- windspeed > 2.47  
| | | | | | | | |   |       |--- value: [145.00]  
| | | | | | | | |--- hr > 1.01  
| | | | | | | | |   |--- weekday <= 0.25  
| | | | | | | | |   |   |--- windspeed <= 1.37  
| | | | | | | | |   |       |--- truncated branch of depth 7  
| | | | | | | | |   |       |--- windspeed > 1.37  
| | | | | | | | |   |           |--- value: [122.00]  
| | | | | | | | |--- weekday > 0.25  
| | | | | | | | |   |   |--- windspeed <= -1.19  
| | | | | | | | |   |       |--- truncated branch of depth 2  
| | | | | | | | |   |       |--- windspeed > -1.19  
| | | | | | | | |       |--- truncated branch of depth 7  
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | |   |--- weekday <= -0.75  
| | | | | | | | |       |--- workingday <= -0.39  
| | | | | | | | |           |--- hr <= 0.43  
| | | | | | | | |               |--- hr <= 0.28  
| | | | | | | | |                   |--- value: [308.00]  
| | | | | | | | |               |--- hr > 0.28  
| | | | | | | | |                   |--- value: [256.00]  
| | | | | | | | |--- hr > 0.43  
| | | | | | | | |   |--- windspeed <= -0.09  
| | | | | | | | |   |   |--- value: [167.00]  
| | | | | | | | |--- windspeed > -0.09  
| | | | | | | | |   |--- hum <= 1.10  
| | | | | | | | |       |--- value: [173.00]  
| | | | | | | | |--- hum > 1.10
```

[illegible]

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| | | | | | | | | |--- value: [106.00]
| | | | | | | | | |--- hum > 0.69
| | | | | | | | | |--- hr <= 0.86
| | | | | | | | | |--- value: [31.00]
| | | | | | | | | |--- hr > 0.86
| | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | |--- atemp > -0.92
| | | | | | | | |--- hum <= 1.47
| | | | | | | | |--- windspeed <= 0.15
| | | | | | | | |--- value: [228.00]
| | | | | | | | |--- windspeed > 0.15
| | | | | | | | |--- truncated branch of depth 4
| | | | | | | | |--- hum > 1.47
| | | | | | | | |--- weekday <= -0.25
| | | | | | | | |--- truncated branch of depth 4
| | | | | | | | |--- weekday > -0.25
| | | | | | | | |--- truncated branch of depth 2
| | | | | | |--- hr > 1.15
| | | | | | |--- hr <= 1.44
| | | | | | |--- workingday <= -0.39
| | | | | | |--- hum <= 0.66
| | | | | | |--- temp <= -1.39
| | | | | | |--- hum <= -0.17
| | | | | | |--- hum <= -0.69
| | | | | | |--- value: [83.00]
| | | | | | |--- hum > -0.69
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- hum > -0.17
| | | | | | |--- weekday <= -0.00
| | | | | | |--- value: [89.00]
| | | | | | |--- weekday > -0.00
| | | | | | |--- value: [96.00]
| | | | | | |--- temp > -1.39
| | | | | | |--- weekday <= 1.24
| | | | | | |--- atemp <= -0.43
| | | | | | |--- truncated branch of depth 3
| | | | | | |--- atemp > -0.43
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- weekday > 1.24
| | | | | | |--- hr <= 1.29
| | | | | | |--- truncated branch of depth 5
| | | | | | |--- hr > 1.29
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- hum > 0.66
| | | | | | |--- weekday <= -0.50
| | | | | | |--- mnth <= 1.44
| | | | | | |--- mnth <= 1.15
| | | | | | |--- value: [87.00]
```

[illegible]


```
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | |   |-- windspeed <= 2.17  
| | | | | | | | |     |-- hum <= 0.14  
| | | | | | | | |       |-- value: [143.00]  
| | | | | | | | |         |-- hum > 0.14  
| | | | | | | | |           |-- truncated branch of depth 4  
| | | | | | | | |             |-- windspeed > 2.17  
| | | | | | | | |               |-- temp <= -0.92  
| | | | | | | | |                 |-- value: [6.00]  
| | | | | | | | |                   |-- temp > -0.92  
| | | | | | | | |                     |-- value: [26.00]  
  
|-- hr > 1.44  
    |-- hr <= 1.58  
        |-- weekday <= -1.25  
            |-- mnth <= 1.15  
                |-- temp <= -0.71  
                    |-- value: [71.00]  
                        |-- temp > -0.71  
                            |-- value: [94.00]  
                                |-- mnth > 1.15  
                                    |-- windspeed <= -0.76  
                                        |-- hum <= 0.45  
                                            |-- value: [43.00]  
                                                |-- hum > 0.45  
                                                    |-- value: [40.00]  
                                                        |-- windspeed > -0.76  
                                                            |-- atemp <= -1.09  
                                                                |-- value: [49.00]  
                                                                    |-- atemp > -1.09  
                                                                        |-- value: [64.00]  
                                                                            |-- weekday > -1.25  
                                                                                |-- weathersit <= 1.68  
                                                                                    |-- atemp <= -0.43  
                                                                                        |-- workingday <= -0.39  
                                                                                            |-- truncated branch of depth 6  
                                                                                                |-- workingday > -0.39  
                                                                                                    |-- truncated branch of depth 7  
                                                                                                        |-- atemp > -0.43  
                                                                                                            |-- temp <= -0.24  
                                                                                                                |-- truncated branch of depth 4  
                                                                                                                    |-- temp > -0.24  
                                                                                                                                �      |-- truncated branch of depth 2  
-- weathersit > 1.68  
    -- weekday <= -0.25  
        -- weekday <= -0.75  
            -- value: [78.00]  
                -- weekday > -0.75  
                    -- value: [87.00]
```

[illegible]

```
| | | | | | | | | |--- hum <= -0.22  
| | | | | | | | | |--- value: [90.00]  
| | | | | | | | | |--- hum > -0.22  
| | | | | | | | | |--- value: [95.00]  
  
| | | | | | | | | |--- yr > -0.01  
| | | | | | | | | |--- hr <= 1.15  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- atemp <= -0.96  
| | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | |--- hr <= -0.30  
| | | | | | | | | |--- hr <= -0.59  
| | | | | | | | | |--- windspeed <= -0.58  
| | | | | | | | | |--- atemp <= -1.14  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- atemp > -1.14  
| | | | | | | | | |--- value: [41.00]  
| | | | | | | | | |--- windspeed > -0.58  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > -0.59  
| | | | | | | | | |--- weekday <= 0.50  
| | | | | | | | | |--- hum <= 0.95  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- hum > 0.95  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- weekday > 0.50  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hr > -0.30  
| | | | | | | | | |--- hr <= 0.72  
| | | | | | | | | |--- atemp <= -1.23  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- atemp > -1.23  
| | | | | | | | | |--- windspeed <= 1.62  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- windspeed > 1.62  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- hum <= -0.32  
| | | | | | | | | |--- atemp <= -1.58  
| | | | | | | | | |--- truncated branch of depth 5
```

```
| | | | | | | | | |--- atemp > -1.58  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- hum > -0.32  
| | | | | | | | | |--- atemp <= -1.23  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- atemp > -1.23  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- hr <= -0.44  
| | | | | | | | | |--- hr <= -0.59  
| | | | | | | | | |--- mnth <= 0.13  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > 0.13  
| | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > -0.59  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | |--- value: [472.00]  
| | | | | | | | | |--- hr > -0.44  
| | | | | | | | | |--- hr <= 0.72  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- hr <= -0.30  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- hr > -0.30  
| | | | | | | | | |--- truncated branch of depth 13  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- hum <= 0.01  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- hr > 1.01
```

```

| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- hum > 0.01
| | | | | | | | | | | | |--- mnth <= 0.13
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- mnth > 0.13
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- atemp > -0.96
| | | | | | | | | | | | |--- hr <= 0.72
| | | | | | | | | | | | |--- hr <= -0.44
| | | | | | | | | | | | |--- hr <= -0.59
| | | | | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | | | | |--- atemp <= -0.56
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- atemp > -0.56
| | | | | | | | | | | | |--- value: [86.00]
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- atemp <= -0.26
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- atemp > -0.26
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- hr > -0.59
| | | | | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | | | | |--- hum <= 1.60
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- hum > 1.60
| | | | | | | | | | | | |--- value: [218.00]
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- mnth <= -1.17
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- mnth > -1.17
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- hr > -0.44
| | | | | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | | | | |--- mnth <= 0.28
| | | | | | | | | | | | |--- hr <= -0.15
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- hr > -0.15
| | | | | | | | | | | | |--- truncated branch of depth 13
| | | | | | | | | | | | |--- mnth > 0.28
| | | | | | | | | | | | |--- hum <= -0.76
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- hum > -0.76
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- hr <= -0.30
| | | | | | | | | | | | |--- mnth <= -1.17
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- mnth > -1.17

```

```
| | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | |--- hr > -0.30
| | | | | | | | | |--- hr <= 0.57
| | | | | | | | | |--- truncated branch of depth 15
| | | | | | | | | |--- hr > 0.57
| | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | | |--- hr > 0.72
| | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | |--- hum <= -0.79
| | | | | | | | | |--- hr <= 1.01
| | | | | | | | | |--- windspeed <= -0.27
| | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | |--- windspeed > -0.27
| | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | |--- hr > 1.01
| | | | | | | | | |--- weekday <= -1.25
| | | | | | | | | |--- value: [143.00]
| | | | | | | | | |--- weekday > -1.25
| | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | |--- hum > -0.79
| | | | | | | | | |--- hum <= -0.45
| | | | | | | | | |--- value: [112.00]
| | | | | | | | | |--- hum > -0.45
| | | | | | | | | |--- atemp <= -0.48
| | | | | | | | | |--- value: [102.00]
| | | | | | | | | |--- atemp > -0.48
| | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | |--- workingday > -0.39
| | | | | | | | | |--- hum <= 0.82
| | | | | | | | | |--- hr <= 1.01
| | | | | | | | | |--- temp <= -0.45
| | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | | |--- temp > -0.45
| | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | |--- hr > 1.01
| | | | | | | | | |--- weekday <= 0.75
| | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | |--- weekday > 0.75
| | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | |--- hum > 0.82
| | | | | | | | | |--- windspeed <= -0.09
| | | | | | | | | |--- weekday <= 0.25
| | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | |--- weekday > 0.25
| | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | |--- windspeed > -0.09
| | | | | | | | | |--- hr <= 0.86
| | | | | | | | | |--- truncated branch of depth 2
```

```
| | | | | | | | | |--- hr > 0.86  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- season > -0.90  
| | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | |--- hr <= 0.57  
| | | | | | | | |--- hr <= -0.44  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- holiday <= 2.82  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | |--- hr > -0.59  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- holiday > 2.82  
| | | | | | | | |--- atemp <= -0.78  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- atemp > -0.78  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- atemp <= -0.34  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- atemp > -0.34  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- hr > -0.59  
| | | | | | | | |--- atemp <= -0.61  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- atemp > -0.61  
| | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- hr > -0.44  
| | | | | | | | |--- workingday <= -0.39  
| | | | | | | | |--- hr <= -0.15  
| | | | | | | | |--- hr <= -0.30  
| | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- hr > -0.30  
| | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | |--- hr > -0.15  
| | | | | | | | |--- atemp <= -0.96  
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- atemp > -0.96  
| | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- hr <= -0.30  
| | | | | | | | |--- temp <= -0.87  
| | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- temp > -0.87  
| | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- hr > -0.30  
| | | | | | | | |--- hr <= -0.01
```

[illegible]


```
| | | | | | | | | | | | |--- temp > -0.35  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | | | | |--- hum <= -0.63  
| | | | | | | | | | | | |--- hr <= 0.64  
| | | | | | | | | | | | |--- weekday <= 0.50  
| | | | | | | | | | | | |--- value: [202.00]  
| | | | | | | | | | | | |--- weekday > 0.50  
| | | | | | | | | | | | |--- value: [242.00]  
| | | | | | | | | | | | |--- hr > 0.64  
| | | | | | | | | | | | |--- windspeed <= 1.07  
| | | | | | | | | | | | |--- value: [689.00]  
| | | | | | | | | | | | |--- windspeed > 1.07  
| | | | | | | | | | | | |--- value: [585.00]  
| | | | | | | | | | | | |--- hum > -0.63  
| | | | | | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | | | | | |--- hum <= 0.58  
| | | | | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | | | | |--- hr <= 0.57  
| | | | | | | | | | | | |--- value: [370.00]  
| | | | | | | | | | | | |--- hr > 0.57  
| | | | | | | | | | | | |--- value: [377.00]  
| | | | | | | | | | | | |--- hum > 0.58  
| | | | | | | | | | | | |--- hr <= -0.44  
| | | | | | | | | | | | |--- mnth <= 1.44  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- mnth > 1.44  
| | | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | | | |--- hr > -0.44  
| | | | | | | | | | | | |--- weekday <= -0.75  
| | | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | | |--- weekday > -0.75  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | | | | |--- hum <= -0.12  
| | | | | | | | | | | | |--- value: [398.00]  
| | | | | | | | | | | | |--- hum > -0.12  
| | | | | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | | | | |--- mnth <= 0.13  
| | | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | | |--- mnth > 0.13  
| | | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | | |--- workingday > -0.39
```

```
| | | | | | | | | |--- temp <= -0.61  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- temp > -0.61  
| | | | | | | | | |--- truncated branch of depth 3  
| | | |--- hr > 1.15  
| | | |--- hr <= 1.44  
| | | |--- atemp <= -1.05  
| | | |--- season <= -0.00  
| | | |--- workingday <= -0.39  
| | | |--- hum <= -1.20  
| | | |--- hum <= -1.26  
| | | |--- hr <= 1.29  
| | | |--- truncated branch of depth 3  
| | | |--- hr > 1.29  
| | | |--- truncated branch of depth 3  
| | | |--- hum > -1.26  
| | | |--- weekday <= -0.00  
| | | |--- value: [111.00]  
| | | |--- weekday > -0.00  
| | | |--- value: [110.00]  
| | | |--- hum > -1.20  
| | | |--- hr <= 1.29  
| | | |--- atemp <= -1.14  
| | | |--- truncated branch of depth 5  
| | | |--- atemp > -1.14  
| | | |--- value: [103.00]  
| | | |--- hr > 1.29  
| | | |--- mnth <= -1.47  
| | | |--- truncated branch of depth 5  
| | | |--- mnth > -1.47  
| | | |--- truncated branch of depth 6  
| | | |--- workingday > -0.39  
| | | |--- mnth <= 0.28  
| | | |--- hr <= 1.29  
| | | |--- temp <= -1.28  
| | | |--- truncated branch of depth 5  
| | | |--- temp > -1.28  
| | | |--- truncated branch of depth 2  
| | | |--- hr > 1.29  
| | | |--- atemp <= -1.14  
| | | |--- truncated branch of depth 7  
| | | |--- atemp > -1.14  
| | | |--- truncated branch of depth 2  
| | | |--- mnth > 0.28  
| | | |--- hum <= 0.82  
| | | |--- atemp <= -1.40  
| | | |--- truncated branch of depth 2  
| | | |--- atemp > -1.40
```

[illegible]

[illegible]

```
| | | | | | | | | |--- hr > 1.29  
| | | | | | | | | |--- value: [39.00]  
| | | | | | | | | --- weekday > 1.00  
| | | | | | | | | |--- mnth <= -0.88  
| | | | | | | | | |--- hr <= 1.29  
| | | | | | | | | | |--- value: [111.00]  
| | | | | | | | | |--- hr > 1.29  
| | | | | | | | | | |--- value: [104.00]  
| | | | | | | | | |--- mnth > -0.88  
| | | | | | | | | |--- value: [84.00]  
  
| | | | | | | | |--- hr > 1.44  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- temp <= -0.97  
| | | | | | | | | |--- hr <= 1.58  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- temp <= -1.39  
| | | | | | | | | | |--- temp <= -1.80  
| | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | |--- temp > -1.80  
| | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- temp > -1.39  
| | | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- hum <= 0.97  
| | | | | | | | | | |--- temp <= -1.13  
| | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | |--- temp > -1.13  
| | | | | | | | | | | |--- value: [19.00]  
| | | | | | | | | |--- hum > 0.97  
| | | | | | | | | | |--- windspeed <= 0.28  
| | | | | | | | | | | |--- value: [12.00]  
| | | | | | | | | | |--- windspeed > 0.28  
| | | | | | | | | | | |--- value: [11.00]  
  
| | | | | | | | |--- hr > 1.58  
| | | | | | | | |--- weekday <= 0.75  
| | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- hum <= -0.84  
| | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > -0.84  
| | | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- value: [28.00]
```

```
| | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |   |--- mnth <= 0.28  
| | | | | | | | | |     |--- truncated branch of depth 5  
| | | | | | | | | |       |--- mnth > 0.28  
| | | | | | | | | |         |--- truncated branch of depth 2  
| | | | | | | | | |           |--- weathersit > 1.68  
| | | | | | | | | |             |--- mnth <= -1.47  
| | | | | | | | | |               |--- value: [38.00]  
| | | | | | | | | |                 |--- mnth > -1.47  
| | | | | | | | | |                   |--- value: [20.00]  
  
| | | | | | | | | |--- temp > -0.97  
| | | | | | | | | |   |--- hr <= 1.58  
| | | | | | | | | |     |--- weathersit <= 1.68  
| | | | | | | | | |       |--- temp <= -0.66  
| | | | | | | | | |         |--- atemp <= -0.70  
| | | | | | | | | |           |--- truncated branch of depth 8  
| | | | | | | | | |             |--- atemp > -0.70  
| | | | | | | | | |               |--- truncated branch of depth 2  
| | | | | | | | | |                 |--- temp > -0.66  
| | | | | | | | | |                   |--- weekday <= -0.25  
| | | | | | | | | |                     |--- truncated branch of depth 3  
| | | | | | | | | |                       |--- weekday > -0.25  
| | | | | | | | | |                         |--- truncated branch of depth 6  
| | | | | | | | | |                           |--- weathersit > 1.68  
| | | | | | | | | |                             |--- value: [55.00]  
| | | | | | | | | |                               |--- hr > 1.58  
| | | | | | | | | |                                 |--- weekday <= 0.25  
| | | | | | | | | |                                   |--- windspeed <= -1.19  
| | | | | | | | | |                                     |--- value: [99.00]  
| | | | | | | | | |                                       |--- windspeed > -1.19  
| | | | | | | | | |                                           |--- workingday <= -0.39  
| | | | | | | | | |                                             |--- value: [29.00]  
| | | | | | | | | |                                                 |--- workingday > -0.39  
| | | | | | | | | |                                                     |--- truncated branch of depth 6  
| | | | | | | | | |                                                         |--- weekday > 0.25  
| | | | | | | | | |                                                             |--- temp <= -0.61  
| | | | | | | | | |                                                                 |--- hum <= 0.30  
| | | | | | | | | |                                                                     |--- truncated branch of depth 4  
| | | | | | | | | |                                                                         |--- hum > 0.30  
| | | | | | | | | |                                                                             |--- value: [23.00]  
| | | | | | | | | |                                                                                 |--- temp > -0.61  
| | | | | | | | | |                                                                                     |--- weekday <= 0.75  
| | | | | | | | | |                                                                                         |--- truncated branch of depth 2  
| | | | | | | | | |                                                                                            |--- weekday > 0.75  
| | | | | | | | | |                                                                                                |--- truncated branch of depth 3  
  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |   |--- hr <= 1.58
```

```
| | | | | | | | | | | | | | | | | | | | | |  
|--- weathersit <= 1.68  
|   |--- weekday <= -0.25  
|     |--- temp <= -0.56  
|       |--- workingday <= -0.39  
|         |--- truncated branch of depth 2  
|           |--- workingday > -0.39  
|             |--- truncated branch of depth 9  
|               |--- temp > -0.56  
|                 |--- weekday <= -1.25  
|                   |--- truncated branch of depth 4  
|                     |--- weekday > -1.25  
|                       |--- truncated branch of depth 4  
|                         |--- weekday > -0.25  
|                           |--- holiday <= 2.82  
|                             |--- hum <= -0.66  
|                               |--- truncated branch of depth 6  
|                                 |--- hum > -0.66  
|                                   |--- truncated branch of depth 9  
|                                     |--- holiday > 2.82  
|                                       |--- value: [44.00]  
|----- weathersit > 1.68  
|      |--- temp <= -0.76  
|        |--- temp <= -0.92  
|          |--- value: [60.00]  
|            |--- temp > -0.92  
|              |--- mnth <= 0.43  
|                |--- value: [13.00]  
|                  |--- mnth > 0.43  
|                    |--- value: [21.00]  
|                      |--- temp > -0.76  
|                        |--- windspeed <= 0.95  
|                          |--- holiday <= 2.82  
|                            |--- truncated branch of depth 2  
|                              |--- holiday > 2.82  
|                                |--- value: [107.00]  
|                                  |--- windspeed > 0.95  
|                                    |--- value: [37.00]  
|----- hr > 1.58  
|      |--- weekday <= 0.75  
|        |--- weathersit <= 0.12  
|          |--- atemp <= -0.70  
|            |--- mnth <= 1.15  
|              |--- truncated branch of depth 6  
|                |--- mnth > 1.15  
|                  |--- truncated branch of depth 9  
|                    |--- atemp > -0.70  
|                      |--- temp <= -0.45  
|                        |--- truncated branch of depth 3
```

```
| | | | | | | | | |--- temp > -0.45  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- weathersit > 0.12  
| | | | | | | | |--- windspeed <= 0.70  
| | | | | | | | |--- hum <= 0.97  
| | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- hum > 0.97  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- windspeed > 0.70  
| | | | | | | | |--- mnth <= 0.43  
| | | | | | | | |--- value: [17.00]  
| | | | | | | | |--- mnth > 0.43  
| | | | | | | | |--- value: [13.00]  
| | | | | | |--- weekday > 0.75  
| | | | | | |--- windspeed <= -0.21  
| | | | | | |--- season <= 0.45  
| | | | | | |--- windspeed <= -1.19  
| | | | | | |--- value: [123.00]  
| | | | | | |--- windspeed > -1.19  
| | | | | | |--- value: [42.00]  
| | | | | | |--- season > 0.45  
| | | | | | |--- temp <= -0.61  
| | | | | | |--- truncated branch of depth 5  
| | | | | | |--- temp > -0.61  
| | | | | | |--- truncated branch of depth 4  
| | | | | | |--- windspeed > -0.21  
| | | | | | |--- temp <= -1.13  
| | | | | | |--- value: [57.00]  
| | | | | | |--- temp > -1.13  
| | | | | | |--- windspeed <= 1.50  
| | | | | | |--- truncated branch of depth 6  
| | | | | | |--- windspeed > 1.50  
| | | | | | |--- value: [67.00]  
|--- temp > -0.14  
| |--- yr <= -0.01  
| | |--- hr <= 1.29  
| | | |--- hr <= 0.57  
| | | |--- workingday <= -0.39  
| | | |--- hr <= -0.30  
| | | |--- hr <= -0.44  
| | | |--- hr <= -0.59  
| | | |--- hum <= 0.92  
| | | |--- season <= -0.00  
| | | |--- truncated branch of depth 4  
| | | |--- season > -0.00  
| | | |--- truncated branch of depth 6  
| | | |--- hum > 0.92  
| | | |--- windspeed <= 1.13
```



```
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- windspeed > 1.13  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > -0.59  
| | | | | | | | | |--- mnth <= 0.86  
| | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- mnth > 0.86  
| | | | | | | | | |--- value: [254.00]  
| | | | | | | | | |--- hr > -0.44  
| | | | | | | | | |--- hum <= 0.92  
| | | | | | | | | |--- windspeed <= 1.37  
| | | | | | | | | |--- atemp <= 1.73  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- atemp > 1.73  
| | | | | | | | | |--- value: [132.00]  
| | | | | | | | | |--- windspeed > 1.37  
| | | | | | | | | |--- value: [53.00]  
| | | | | | | | | |--- hum > 0.92  
| | | | | | | | | |--- hum <= 1.34  
| | | | | | | | | |--- hum <= 1.21  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 1.21  
| | | | | | | | | |--- value: [177.00]  
| | | | | | | | | |--- hum > 1.34  
| | | | | | | | | |--- atemp <= 0.27  
| | | | | | | | | |--- value: [100.00]  
| | | | | | | | | |--- atemp > 0.27  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > -0.30  
| | | | | | | | | |--- hum <= 0.82  
| | | | | | | | | |--- hr <= -0.15  
| | | | | | | | | |--- windspeed <= -0.58  
| | | | | | | | | |--- atemp <= 1.15  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- atemp > 1.15  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- windspeed > -0.58  
| | | | | | | | | |--- windspeed <= 2.78  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- windspeed > 2.78  
| | | | | | | | | |--- value: [142.00]  
| | | | | | | | | |--- hr > -0.15  
| | | | | | | | | |--- atemp <= 0.27  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- truncated branch of depth 9
```

```
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- atemp > 0.27  
| | | | | | | | | |--- temp <= 1.83  
| | | | | | | | | |--- truncated branch of depth 15  
| | | | | | | | | |--- temp > 1.83  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | |--- hum > 0.82  
| | | | | | | | |--- windspeed <= 2.35  
| | | | | | | | |--- temp <= 1.00  
| | | | | | | | |--- season <= 0.90  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- season > 0.90  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- temp > 1.00  
| | | | | | | | |--- hum <= 0.97  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |--- hum > 0.97  
| | | | | | | | |--- value: [68.00]  
| | | | | | | | |--- windspeed > 2.35  
| | | | | | | | |--- hum <= 1.21  
| | | | | | | | |--- hr <= 0.43  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- hr > 0.43  
| | | | | | | | |--- value: [78.00]  
| | | | | | | | |--- hum > 1.21  
| | | | | | | | |--- hr <= 0.43  
| | | | | | | | |--- value: [23.00]  
| | | | | | | | |--- hr > 0.43  
| | | | | | | | |--- value: [30.00]  
| | | | | | | | |--- workingday > -0.39  
| | | | | | | | |--- hr <= -0.44  
| | | | | | | | |--- hr <= -0.59  
| | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | |--- mnth <= -0.30  
| | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | |--- mnth > -0.30  
| | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- truncated branch of depth 17  
| | | | | | | | |--- weekday > 0.75  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- weathersit > 1.68  
| | | | | | | | |--- season <= -0.00  
| | | | | | | | |--- value: [314.00]  
| | | | | | | | |--- season > -0.00
```

[illegible]

```

| | | | | | | | |--- hum > 0.82
| | | | | | | | |--- hr <= -0.30
| | | | | | | | | | |--- hum <= 1.49
| | | | | | | | | | |--- temp <= 0.59
| | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | |--- temp > 0.59
| | | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | | |--- hum > 1.49
| | | | | | | | | | |--- weathersit <= 1.68
| | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | |--- weathersit > 1.68
| | | | | | | | | | |--- truncated branch of depth 4
| | | | | | | | | | |--- hr > -0.30
| | | | | | | | | | |--- atemp <= 0.54
| | | | | | | | | | |--- mnth <= -0.16
| | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | |--- mnth > -0.16
| | | | | | | | | | |--- truncated branch of depth 11
| | | | | | | | | | |--- atemp > 0.54
| | | | | | | | | | |--- temp <= 1.00
| | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | |--- temp > 1.00
| | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | |--- hr > 0.57
| | | | | | | | |--- hr <= 1.15
| | | | | | | | |--- hr <= 0.72
| | | | | | | | |--- workingday <= -0.39
| | | | | | | | |--- windspeed <= 1.92
| | | | | | | | |--- temp <= 0.07
| | | | | | | | |--- holiday <= 2.82
| | | | | | | | |--- truncated branch of depth 3
| | | | | | | | |--- holiday > 2.82
| | | | | | | | |--- value: [114.00]
| | | | | | | | |--- temp > 0.07
| | | | | | | | |--- temp <= 2.04
| | | | | | | | |--- truncated branch of depth 10
| | | | | | | | |--- temp > 2.04
| | | | | | | | |--- truncated branch of depth 3
| | | | | | | | |--- windspeed > 1.92
| | | | | | | | |--- holiday <= 2.82
| | | | | | | | |--- temp <= 0.38
| | | | | | | | |--- value: [33.00]
| | | | | | | | |--- temp > 0.38
| | | | | | | | |--- value: [24.00]
| | | | | | | | |--- holiday > 2.82
| | | | | | | | |--- value: [243.00]
| | | | | | | | |--- workingday > -0.39
| | | | | | | | |--- hum <= 0.66

```

```
| | | | | | | | | |--- mnth <= -0.59  
| | | | | | | | | |--- mnth <= -0.88  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- mnth > -0.88  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- mnth > -0.59  
| | | | | | | | | |--- atemp <= 1.77  
| | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | |--- atemp > 1.77  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- hum > 0.66  
| | | | | | | | | |--- windspeed <= -1.00  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | |--- value: [56.00]  
| | | | | | | | | |--- windspeed > -1.00  
| | | | | | | | | |--- windspeed <= 1.07  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- windspeed > 1.07  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- hr > 0.72  
| | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | |--- hum <= 1.34  
| | | | | | | | | |--- temp <= 0.38  
| | | | | | | | | |--- mnth <= 1.15  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- mnth > 1.15  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- temp > 0.38  
| | | | | | | | | |--- hum <= 0.82  
| | | | | | | | | |--- truncated branch of depth 15  
| | | | | | | | | |--- hum > 0.82  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > 1.34  
| | | | | | | | | |--- mnth <= 0.57  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > 1.01  
| | | | | | | | | |--- value: [71.00]  
| | | | | | | | | |--- mnth > 0.57  
| | | | | | | | | |--- hum <= 1.49  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hum > 1.49  
| | | | | | | | | |--- value: [175.00]  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- hr <= 1.01  
| | | | | | | | | |--- hum <= 1.21
```

```
| | | | | | | | | |--- mnth <= -0.88  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- mnth > -0.88  
| | | | | | | | | |--- truncated branch of depth 20  
| | | | | | | | | |--- hum > 1.21  
| | | | | | | | | |--- hum <= 1.49  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- hum > 1.49  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > 1.01  
| | | | | | | | | |--- atemp <= 0.80  
| | | | | | | | | |--- hum <= 1.49  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- hum > 1.49  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- atemp > 0.80  
| | | | | | | | | |--- mnth <= -0.88  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > -0.88  
| | | | | | | | | |--- truncated branch of depth 18  
| | | | | | | | | |--- hr > 1.15  
| | | | | | | | | |--- atemp <= 0.80  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- atemp <= 0.19  
| | | | | | | | | |--- weekday <= -1.25  
| | | | | | | | | |--- hum <= 0.51  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 0.51  
| | | | | | | | | |--- value: [174.00]  
| | | | | | | | | |--- weekday > -1.25  
| | | | | | | | | |--- season <= 0.90  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- season > 0.90  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- atemp > 0.19  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- hum <= 1.18  
| | | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | | |--- hum > 1.18  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- weekday <= -0.00  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- weekday > -0.00  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- windspeed <= 0.15
```

```
| | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- value: [213.00]  
| | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | |--- value: [105.00]  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- atemp <= 0.45  
| | | | | | | | | |--- season <= 0.90  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- season > 0.90  
| | | | | | | | | |--- value: [90.00]  
| | | | | | | | | |--- atemp > 0.45  
| | | | | | | | | |--- mnth <= 0.57  
| | | | | | | | | |--- value: [58.00]  
| | | | | | | | | |--- mnth > 0.57  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- atemp > 0.80  
| | | | | | | | | |--- hum <= 0.74  
| | | | | | | | | |--- mnth <= -0.59  
| | | | | | | | | |--- weekday <= 0.50  
| | | | | | | | | |--- atemp <= 0.89  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- atemp > 0.89  
| | | | | | | | | |--- value: [166.00]  
| | | | | | | | | |--- weekday > 0.50  
| | | | | | | | | |--- mnth <= -1.17  
| | | | | | | | | |--- value: [124.00]  
| | | | | | | | | |--- mnth > -1.17  
| | | | | | | | | |--- value: [149.00]  
| | | | | | | | | |--- mnth > -0.59  
| | | | | | | | | |--- workingday <= -0.39  
| | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- temp <= 1.73  
| | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | |--- temp > 1.73  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 0.74  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- temp <= 1.21  
| | | | | | | | | |--- hum <= 0.95  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 0.95  
| | | | | | | | | |--- truncated branch of depth 3
```

[illegible]

[illegible]

```
| | | | | | | | | |--- windspeed > 1.62  
| | | | | | | | | |--- value: [130.00]  
| | | | | | | | | |--- weekday > -0.75  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- value: [113.00]  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- truncated branch of depth 18  
| | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | |--- atemp <= 1.24  
| | | | | | | | | |--- value: [457.00]  
| | | | | | | | | |--- atemp > 1.24  
| | | | | | | | | |--- value: [149.00]  
| | | | | | | | |--- hum > 0.95  
| | | | | | | | |--- hum <= 1.49  
| | | | | | | | |--- mnth <= 0.28  
| | | | | | | | |--- mnth <= -0.30  
| | | | | | | | |--- value: [229.00]  
| | | | | | | | |--- mnth > -0.30  
| | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | |--- mnth > 0.28  
| | | | | | | | |--- mnth <= 0.57  
| | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | |--- mnth > 0.57  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- hum > 1.49  
| | | | | | | | |--- value: [60.00]  
| | | | | | | | |--- hr > 1.44  
| | | | | | | | |--- weekday <= -0.75  
| | | | | | | | |--- holiday <= 2.82  
| | | | | | | | |--- mnth <= -0.59  
| | | | | | | | |--- windspeed <= 1.56  
| | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | |--- windspeed > 1.56  
| | | | | | | | |--- value: [75.00]  
| | | | | | | | |--- mnth > -0.59  
| | | | | | | | |--- windspeed <= 1.25  
| | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | |--- windspeed > 1.25  
| | | | | | | | |--- value: [95.00]  
| | | | | | | | |--- holiday > 2.82  
| | | | | | | | |--- windspeed <= -0.33  
| | | | | | | | |--- value: [326.00]  
| | | | | | | | |--- windspeed > -0.33  
| | | | | | | | |--- value: [106.00]  
| | | | | | | | |--- weekday > -0.75  
| | | | | | | | |--- hum <= 1.21  
| | | | | | | | |--- mnth <= -0.59  
| | | | | | | | |--- windspeed <= 0.15
```

[illegible]

[illegible]

[illegible]

```
| | | | | | | | | | --- mnth <= -0.59  
| | | | | | | | | | |--- atemp <= 0.18  
| | | | | | | | | | | |--- value: [154.00]  
| | | | | | | | | | |--- atemp > 0.18  
| | | | | | | | | | | |--- value: [597.00]  
| | | | | | | | | | |--- mnth > -0.59  
| | | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | | |--- hr > -0.44  
| | | | | | | | | | | |--- weekday <= -0.50  
| | | | | | | | | | | |--- atemp <= 0.93  
| | | | | | | | | | | |--- hum <= -0.37  
| | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | | |--- hum > -0.37  
| | | | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | | |--- atemp > 0.93  
| | | | | | | | | | |--- season <= -0.00  
| | | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | |--- season > -0.00  
| | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | |--- weekday > -0.50  
| | | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | | |--- mnth <= 0.57  
| | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | |--- mnth > 0.57  
| | | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | | |--- windspeed <= 0.40  
| | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | |--- windspeed > 0.40  
| | | | | | | | | | | |--- value: [288.00]  
| | | | | | | | | | |--- hr > -0.30  
| | | | | | | | | | | |--- hum <= 0.30  
| | | | | | | | | | | |--- atemp <= 1.15  
| | | | | | | | | | | |--- holiday <= 2.82  
| | | | | | | | | | | |--- hr <= -0.15  
| | | | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | | | |--- hr > -0.15  
| | | | | | | | | | | |--- truncated branch of depth 15  
| | | | | | | | | | |--- holiday > 2.82  
| | | | | | | | | | |--- hum <= -0.22  
| | | | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | | |--- hum > -0.22  
| | | | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | | |--- atemp > 1.15  
| | | | | | | | | | |--- atemp <= 2.04
```

```
| | | | | | | | | |--- hr <= -0.15  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- hr > -0.15  
| | | | | | | | | |--- truncated branch of depth 13  
| | | | | | | | |--- atemp > 2.04  
| | | | | | | | |--- windspeed <= 1.80  
| | | | | | | | |--- truncated branch of depth 8  
| | | | | | | | |--- windspeed > 1.80  
| | | | | | | | |--- value: [526.00]  
| | | | | | | |--- hum > 0.30  
| | | | | | | |--- temp <= 0.79  
| | | | | | | |--- season <= -0.90  
| | | | | | | |--- hr <= -0.15  
| | | | | | | |--- value: [443.00]  
| | | | | | | |--- hr > -0.15  
| | | | | | | |--- truncated branch of depth 2  
| | | | | | | |--- season > -0.90  
| | | | | | | |--- mnth <= 0.57  
| | | | | | | |--- truncated branch of depth 9  
| | | | | | | |--- mnth > 0.57  
| | | | | | | |--- truncated branch of depth 4  
| | | | | | | |--- temp > 0.79  
| | | | | | | |--- hr <= -0.15  
| | | | | | | |--- hum <= 0.48  
| | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- hum > 0.48  
| | | | | | | |--- truncated branch of depth 3  
| | | | | | | |--- hr > -0.15  
| | | | | | | |--- windspeed <= 1.13  
| | | | | | | |--- truncated branch of depth 7  
| | | | | | | |--- windspeed > 1.13  
| | | | | | | |--- truncated branch of depth 2  
| | | | | |--- workingday > -0.39  
| | | | | |--- hr <= -0.44  
| | | | | |--- hr <= -0.59  
| | | | | |--- weathersit <= 1.68  
| | | | | |--- hum <= 1.03  
| | | | | |--- weekday <= 0.75  
| | | | | |--- truncated branch of depth 15  
| | | | | |--- weekday > 0.75  
| | | | | |--- truncated branch of depth 6  
| | | | | |--- hum > 1.03  
| | | | | |--- atemp <= 0.10  
| | | | | |--- truncated branch of depth 3  
| | | | | |--- atemp > 0.10  
| | | | | |--- truncated branch of depth 8  
| | | | | |--- weathersit > 1.68  
| | | | | |--- hum <= 0.92
```

```
| | | | | | | | | |--- weekday <= -0.50  
| | | | | | | | | |--- value: [407.00]  
| | | | | | | | | |--- weekday > -0.50  
| | | | | | | | | |--- value: [483.00]  
| | | | | | | | | |--- hum > 0.92  
| | | | | | | | | |--- atemp <= 0.05  
| | | | | | | | | |--- value: [372.00]  
| | | | | | | | | |--- atemp > 0.05  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hr > -0.59  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- mnth <= 0.57  
| | | | | | | | | |--- hum <= 0.92  
| | | | | | | | | |--- truncated branch of depth 11  
| | | | | | | | | |--- hum > 0.92  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- mnth > 0.57  
| | | | | | | | | |--- hum <= 1.49  
| | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | |--- hum > 1.49  
| | | | | | | | | |--- value: [467.00]  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- hum <= 1.08  
| | | | | | | | | |--- hum <= -0.19  
| | | | | | | | | |--- value: [576.00]  
| | | | | | | | | |--- hum > -0.19  
| | | | | | | | | |--- value: [646.00]  
| | | | | | | | | |--- hum > 1.08  
| | | | | | | | | |--- windspeed <= -0.46  
| | | | | | | | | |--- value: [535.00]  
| | | | | | | | | |--- windspeed > -0.46  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- hr > -0.44  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- hr <= -0.30  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- mnth <= 0.28  
| | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | |--- mnth > 0.28  
| | | | | | | | | |--- truncated branch of depth 12  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- hum <= 1.08  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- hum > 1.08  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- hr > -0.30  
| | | | | | | | | |--- hr <= -0.01  
| | | | | | | | | |--- weathersit <= 1.68
```



```

| | | | | | | | | | | | |--- truncated branch of depth 19
| | | | | | | | | | | | |--- weathersit > 1.68
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- hr > -0.01
| | | | | | | | | | | | |--- hum <= 0.82
| | | | | | | | | | | | |--- truncated branch of depth 20
| | | | | | | | | | | | |--- hum > 0.82
| | | | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | | | |--- weekday > 0.75
| | | | | | | | | | | | |--- season <= -0.90
| | | | | | | | | | | | |--- hr <= -0.01
| | | | | | | | | | | | |--- hum <= 1.78
| | | | | | | | | | | | |--- truncated branch of depth 2
| | | | | | | | | | | | |--- hum > 1.78
| | | | | | | | | | | | |--- value: [126.00]
| | | | | | | | | | | | |--- hr > -0.01
| | | | | | | | | | | | |--- atemp <= 0.10
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- atemp > 0.10
| | | | | | | | | | | | |--- value: [222.00]
| | | | | | | | | | | | |--- season > -0.90
| | | | | | | | | | | | |--- hr <= -0.01
| | | | | | | | | | | | |--- hr <= -0.30
| | | | | | | | | | | | |--- truncated branch of depth 10
| | | | | | | | | | | | |--- hr > -0.30
| | | | | | | | | | | | |--- truncated branch of depth 11
| | | | | | | | | | | | |--- hr > -0.01
| | | | | | | | | | | | |--- hum <= 0.56
| | | | | | | | | | | | |--- truncated branch of depth 13
| | | | | | | | | | | | |--- hum > 0.56
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- hr > 0.57
| | | | | | | | | | | | |--- hr <= 1.01
| | | | | | | | | | | | |--- hr <= 0.72
| | | | | | | | | | | | |--- weathersit <= 1.68
| | | | | | | | | | | | |--- workingday <= -0.39
| | | | | | | | | | | | |--- temp <= 1.31
| | | | | | | | | | | | |--- mnth <= 0.57
| | | | | | | | | | | | |--- truncated branch of depth 11
| | | | | | | | | | | | |--- mnth > 0.57
| | | | | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | | | | | |--- temp > 1.31
| | | | | | | | | | | | |--- atemp <= 1.86
| | | | | | | | | | | | |--- truncated branch of depth 7
| | | | | | | | | | | | |--- atemp > 1.86
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- workingday > -0.39
| | | | | | | | | | | | |--- mnth <= 0.28

```

```
| | | | | | | | | |--- weekday <= 0.75
| | | | | | | | | |--- truncated branch of depth 15
| | | | | | | | | |--- weekday > 0.75
| | | | | | | | | |--- truncated branch of depth 9
| | | | | | | | |--- mnth > 0.28
| | | | | | | | |--- mnth <= 1.15
| | | | | | | | |--- truncated branch of depth 10
| | | | | | | | |--- mnth > 1.15
| | | | | | | | |--- truncated branch of depth 3
| | | | | | |--- weathersit > 1.68
| | | | | | |--- hum <= 0.92
| | | | | | |--- mnth <= -0.01
| | | | | | |--- hum <= 0.43
| | | | | | |--- truncated branch of depth 4
| | | | | | |--- hum > 0.43
| | | | | | |--- value: [389.00]
| | | | | | |--- mnth > -0.01
| | | | | | |--- weekday <= -0.75
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- weekday > -0.75
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- hum > 0.92
| | | | | | |--- mnth <= 0.28
| | | | | | |--- hum <= 1.47
| | | | | | |--- value: [326.00]
| | | | | | |--- hum > 1.47
| | | | | | |--- value: [177.00]
| | | | | | |--- mnth > 0.28
| | | | | | |--- hum <= 1.34
| | | | | | |--- truncated branch of depth 2
| | | | | | |--- hum > 1.34
| | | | | | |--- value: [173.00]
| | | | | |--- hr > 0.72
| | | | | |--- workingday <= -0.39
| | | | | |--- hum <= 0.53
| | | | | |--- atemp <= 1.51
| | | | | |--- temp <= 0.28
| | | | | | |--- truncated branch of depth 8
| | | | | | |--- temp > 0.28
| | | | | | |--- truncated branch of depth 13
| | | | | | |--- atemp > 1.51
| | | | | | |--- windspeed <= -0.33
| | | | | | |--- truncated branch of depth 6
| | | | | | |--- windspeed > -0.33
| | | | | | |--- truncated branch of depth 8
| | | | | |--- hum > 0.53
| | | | | |--- hum <= 0.95
| | | | | |--- windspeed <= -1.13
```

```
| | | | | | | | | |--- value: [500.00]
| | | | | | | | | |--- windspeed > -1.13
| | | | | | | | |   |-- truncated branch of depth 5
| | | | | | | |     |-- hum > 0.95
| | | | | | |       |-- atemp <= 0.49
| | | | | |         |-- truncated branch of depth 4
| | | | |           |-- atemp > 0.49
| | | |             |-- truncated branch of depth 2
| |               |-- workingday > -0.39
|                 |-- hum <= 0.90
|                   |-- mnth <= -0.01
|                     |-- weathersit <= 1.68
|                       |-- truncated branch of depth 16
|                         |-- weathersit > 1.68
|                           |-- truncated branch of depth 4
|                             |-- mnth > -0.01
|                               |-- weekday <= 0.75
|                                 |-- truncated branch of depth 13
|                                   |-- weekday > 0.75
|                                     |-- truncated branch of depth 9
|                                       |-- hum > 0.90
|                                         |-- hum <= 1.34
|                                           |-- weathersit <= 0.12
|                                             |-- truncated branch of depth 3
|                                               |-- weathersit > 0.12
|                                                 |-- truncated branch of depth 7
|                                                   |-- hum > 1.34
|                                                     |-- windspeed <= 1.31
|                                                       |-- truncated branch of depth 2
|                                                         |-- windspeed > 1.31
|                                                           |-- value: [715.00]
|-- hr > 1.01
|   |-- workingday <= -0.39
|     |-- hr <= 1.15
|       |-- hum <= 0.43
|         |-- atemp <= 0.80
|           |-- windspeed <= -0.58
|             |-- value: [215.00]
|               |-- windspeed > -0.58
|                 |-- truncated branch of depth 8
|                   |-- atemp > 0.80
|                     |-- atemp <= 1.24
|                       |-- truncated branch of depth 9
|                         |-- atemp > 1.24
|                           |-- truncated branch of depth 8
|                             |-- hum > 0.43
|                               |-- windspeed <= 1.80
|                                 |-- hum <= 1.21
```

[illegible]

```
| | | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | | |--- weekday > 0.75  
| | | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | | |--- hr > 1.15  
| | | | | | | | | | |--- atemp <= 0.63  
| | | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | | |--- windspeed <= -0.33  
| | | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | | |--- windspeed > -0.33  
| | | | | | | | | | |--- truncated branch of depth 10  
| | | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | | |--- weekday <= -0.25  
| | | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | | |--- value: [51.00]  
| | | | | | | | | | |--- atemp > 0.63  
| | | | | | | | | | |--- windspeed <= 2.59  
| | | | | | | | | | |--- mnth <= -0.30  
| | | | | | | | | | |--- truncated branch of depth 9  
| | | | | | | | | | |--- mnth > -0.30  
| | | | | | | | | | |--- truncated branch of depth 14  
| | | | | | | | | | |--- windspeed > 2.59  
| | | | | | | | | | |--- mnth <= -0.30  
| | | | | | | | | | |--- value: [204.00]  
| | | | | | | | | | |--- mnth > -0.30  
| | | | | | | | | | |--- value: [202.00]  
| | | | |--- hr > 1.29  
| | | | |--- hr <= 1.58  
| | | | |--- atemp <= 0.71  
| | | | |--- weathersit <= 1.68  
| | | | |--- hr <= 1.44  
| | | | |--- weekday <= -1.25  
| | | | |--- temp <= 0.07  
| | | | |--- mnth <= -0.88  
| | | | |--- value: [149.00]  
| | | | |--- mnth > -0.88  
| | | | |--- truncated branch of depth 2  
| | | | |--- temp > 0.07  
| | | | |--- hum <= -1.13  
| | | | |--- value: [130.00]  
| | | | |--- hum > -1.13  
| | | | |--- truncated branch of depth 5  
| | | | |--- weekday > -1.25  
| | | | |--- hum <= 0.92  
| | | | |--- atemp <= 0.27  
| | | | |--- truncated branch of depth 8  
| | | | |--- atemp > 0.27
```


[illegible]

```

| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- windspeed > 1.50
| | | | | | | | | | | | |--- value: [226.00]
| | | | | | | | | | | | |--- weekday > -1.25
| | | | | | | | | | | | |--- hum <= 0.84
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- hum > 0.84
| | | | | | | | | | | | |--- value: [161.00]
| | | | | | | | | | | | |--- atemp > 1.33
| | | | | | | | | | | | |--- value: [284.00]
| | | | | | | | | | | | |--- weekday > -0.75
| | | | | | | | | | | | |--- holiday <= 2.82
| | | | | | | | | | | | |--- hr <= 1.44
| | | | | | | | | | | | |--- weathersit <= 0.12
| | | | | | | | | | | | |--- weekday <= 0.75
| | | | | | | | | | | | |--- truncated branch of depth 11
| | | | | | | | | | | | |--- weekday > 0.75
| | | | | | | | | | | | |--- truncated branch of depth 8
| | | | | | | | | | | | |--- weathersit > 0.12
| | | | | | | | | | | | |--- windspeed <= 0.52
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- windspeed > 0.52
| | | | | | | | | | | | |--- truncated branch of depth 3
| | | | | | | | | | | | |--- hr > 1.44
| | | | | | | | | | | | |--- hum <= -0.48
| | | | | | | | | | | | |--- mnth <= -0.30
| | | | | | | | | | | | |--- value: [338.00]
| | | | | | | | | | | | |--- mnth > -0.30
| | | | | | | | | | | | |--- truncated branch of depth 6
| | | | | | | | | | | | |--- hum > -0.48
| | | | | | | | | | | | |--- weekday <= -0.25
| | | | | | | | | | | | |--- truncated branch of depth 5
| | | | | | | | | | | | |--- weekday > -0.25
| | | | | | | | | | | | |--- truncated branch of depth 10
| | | | | | | | | | | | |--- holiday > 2.82
| | | | | | | | | | | | |--- temp <= 1.73
| | | | | | | | | | | | |--- value: [502.00]
| | | | | | | | | | | | |--- temp > 1.73
| | | | | | | | | | | | |--- value: [584.00]
| | | | | | | | | | | | |--- hr > 1.58
| | | | | | | | | | | | |--- weekday <= -0.25
| | | | | | | | | | | | |--- temp <= 0.59
| | | | | | | | | | | | |--- mnth <= -0.59
| | | | | | | | | | | | |--- weekday <= -0.75
| | | | | | | | | | | | |--- windspeed <= -1.00
| | | | | | | | | | | | |--- value: [82.00]
| | | | | | | | | | | | |--- windspeed > -1.00
| | | | | | | | | | | | |--- windspeed <= -0.33

```


[illegible]

```
| | | | | | | | | |--- atemp > 1.15  
| | | | | | | | | |--- truncated branch of depth 5  
| | | | | | | | | |--- hum > 1.08  
| | | | | | | | | |--- value: [70.00]  
| | | | | | | | | |--- workingday > -0.39  
| | | | | | | | | |--- temp <= 1.21  
| | | | | | | | | |--- windspeed <= 0.15  
| | | | | | | | | |--- hum <= 1.08  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- hum > 1.08  
| | | | | | | | | |--- truncated branch of depth 3  
| | | | | | | | | |--- windspeed > 0.15  
| | | | | | | | | |--- weathersit <= 0.12  
| | | | | | | | | |--- truncated branch of depth 4  
| | | | | | | | | |--- weathersit > 0.12  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- temp > 1.21  
| | | | | | | | | |--- atemp <= 1.15  
| | | | | | | | | |--- value: [102.00]  
| | | | | | | | | |--- atemp > 1.15  
| | | | | | | | | |--- weekday <= -0.75  
| | | | | | | | | |--- value: [166.00]  
| | | | | | | | | |--- weekday > -0.75  
| | | | | | | | | |--- value: [192.00]  
| | | | | | | | | |--- weekday > -0.25  
| | | | | | | | | |--- weekday <= 0.75  
| | | | | | | | | |--- atemp <= 0.71  
| | | | | | | | | |--- weathersit <= 1.68  
| | | | | | | | | |--- season <= -0.90  
| | | | | | | | | |--- windspeed <= -0.09  
| | | | | | | | | |--- value: [91.00]  
| | | | | | | | | |--- windspeed > -0.09  
| | | | | | | | | |--- truncated branch of depth 2  
| | | | | | | | | |--- season > -0.90  
| | | | | | | | | |--- weekday <= 0.25  
| | | | | | | | | |--- truncated branch of depth 6  
| | | | | | | | | |--- weekday > 0.25  
| | | | | | | | | |--- truncated branch of depth 7  
| | | | | | | | | |--- weathersit > 1.68  
| | | | | | | | | |--- windspeed <= 0.03  
| | | | | | | | | |--- value: [45.00]  
| | | | | | | | | |--- windspeed > 0.03  
| | | | | | | | | |--- value: [65.00]  
| | | | | | | | | |--- atemp > 0.71  
| | | | | | | | | |--- windspeed <= 0.83  
| | | | | | | | | |--- hum <= -0.40  
| | | | | | | | | |--- mnth <= -0.01  
| | | | | | | | | |--- truncated branch of depth 3
```



```

performance metrics (MSE and RMSE) averaged over 6 folds. The RMSE values
    ↳ indicate an error
that is within acceptable limits relative to the range of the actual bike
    ↳ counts, and the computational
times were very efficient. A clear benefit of decision tree regressors is that,
    ↳ like their classification
counterparts, they can be easily translated into a set of rules that illustrate
    ↳ exactly how predictions
are made. When comparing with the SVM regressor from Part 4, decision trees are
    ↳ generally more
interpretable but might be more prone to overfitting unless properly pruned or
    ↳ regularized.
Ultimately, the choice between a decision tree regressor and other approaches
    ↳ such as SVR
depends on the requirements for performance versus interpretability in the
    ↳ practical application.
'''

```

```

[12]: '\nPart 6 - Decision Tree Regressor\nIn the regression setting, a Decision Tree
Regressor was used to predict bike counts with\nperformance metrics (MSE and
RMSE) averaged over 6 folds. The RMSE values indicate an error\nthat is within
acceptable limits relative to the range of the actual bike counts, and the
computational\ntimes were very efficient. A clear benefit of decision tree
regressors is that, like their classification\ncounterparts, they can be easily
translated into a set of rules that illustrate exactly how predictions\nare
made. When comparing with the SVM regressor from Part 4, decision trees are
generally more\ninterpretable but might be more prone to overfitting unless
properly pruned or regularized.\nUltimately, the choice between a decision tree
regressor and other approaches such as SVR\ndepends on the requirements for
performance versus interpretability in the practical application.\n'

```

```

[13]: pip install nbconvert

```

```

Requirement already satisfied: nbconvert in c:\users\dalis\anaconda3\lib\site-
packages (7.16.4)
Requirement already satisfied: beautifulsoup4 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (4.12.3)
Requirement already satisfied: bleach!=5.0.0 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (4.1.0)
Requirement already satisfied: defusedxml in c:\users\dalis\anaconda3\lib\site-
packages (from nbconvert) (0.7.1)
Requirement already satisfied: Jinja2>=3.0 in c:\users\dalis\anaconda3\lib\site-
packages (from nbconvert) (3.1.4)
Requirement already satisfied: jupyter-core>=4.7 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (5.7.2)
Requirement already satisfied: jupyterlab-pygments in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (0.1.2)

```

Requirement already satisfied: markupsafe>=2.0 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (2.1.3)

Requirement already satisfied: mistune<4,>=2.0.3 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (2.0.4)

Requirement already satisfied: nbclient>=0.5.0 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (0.8.0)

Requirement already satisfied: nbformat>=5.7 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (5.10.4)

Requirement already satisfied: packaging in c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (24.1)

Requirement already satisfied: pandocfilters>=1.4.1 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (1.5.0)

Requirement already satisfied: pygments>=2.4.1 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (2.15.1)

Requirement already satisfied: tinycss2 in c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (1.2.1)

Requirement already satisfied: traitlets>=5.1 in
c:\users\dalis\anaconda3\lib\site-packages (from nbconvert) (5.14.3)

Requirement already satisfied: six>=1.9.0 in c:\users\dalis\anaconda3\lib\site-packages (from bleach!=5.0.0->nbconvert) (1.16.0)

Requirement already satisfied: webencodings in
c:\users\dalis\anaconda3\lib\site-packages (from bleach!=5.0.0->nbconvert) (0.5.1)

Requirement already satisfied: platformdirs>=2.5 in
c:\users\dalis\anaconda3\lib\site-packages (from jupyter-core>=4.7->nbconvert) (3.10.0)

Requirement already satisfied: pywin32>=300 in
c:\users\dalis\anaconda3\lib\site-packages (from jupyter-core>=4.7->nbconvert) (305.1)

Requirement already satisfied: jupyter-client>=6.1.12 in
c:\users\dalis\anaconda3\lib\site-packages (from nbclient>=0.5.0->nbconvert) (8.6.0)

Requirement already satisfied: fastjsonschema>=2.15 in
c:\users\dalis\anaconda3\lib\site-packages (from nbformat>=5.7->nbconvert) (2.16.2)

Requirement already satisfied: jsonschema>=2.6 in
c:\users\dalis\anaconda3\lib\site-packages (from nbformat>=5.7->nbconvert) (4.23.0)

Requirement already satisfied: soupsieve>1.2 in
c:\users\dalis\anaconda3\lib\site-packages (from beautifulsoup4->nbconvert) (2.5)

Requirement already satisfied: attrs>=22.2.0 in
c:\users\dalis\anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.7->nbconvert) (23.1.0)

Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
c:\users\dalis\anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.7->nbconvert) (2023.7.1)

Requirement already satisfied: referencing>=0.28.4 in

```
c:\users\dalis\anaconda3\lib\site-packages (from
jsonschema>=2.6->nbformat>=5.7->nbconvert) (0.30.2)
Requirement already satisfied: rpds-py>=0.7.1 in
c:\users\dalis\anaconda3\lib\site-packages (from
jsonschema>=2.6->nbformat>=5.7->nbconvert) (0.10.6)
Requirement already satisfied: python-dateutil>=2.8.2 in
c:\users\dalis\anaconda3\lib\site-packages (from jupyter-
client>=6.1.12->nbclient>=0.5.0->nbconvert) (2.9.0.post0)
Requirement already satisfied: pyzmq>=23.0 in c:\users\dalis\anaconda3\lib\site-
packages (from jupyter-client>=6.1.12->nbclient>=0.5.0->nbconvert) (25.1.2)
Requirement already satisfied: tornado>=6.2 in
c:\users\dalis\anaconda3\lib\site-packages (from jupyter-
client>=6.1.12->nbclient>=0.5.0->nbconvert) (6.4.1)
Note: you may need to restart the kernel to use updated packages.
```