

Diabetes Prediction Software - Test Cases + Results

PASS CASES

Test Name: Record::getFeatures - normal

Test Description: Test getFeatures() on Record with features [120.0, 30.0, 45.0]

Pass / Fail: Pass

Comments: Returned correct features list [120.0, 30.0, 45.0]

Test Name: Record::getLabel - true label

Test Description: Test getLabel() on Record with label true

Pass / Fail: Pass

Comments: Returned true as expected

Test Name: RecordCollector::addRecord - single record

Test Description: Add one Record to RecordCollector and verify storage

Pass / Fail: Pass

Comments: Record stored successfully

Test Name: RecordCollector::loadFromCSV - valid file

Test Description: Load two records from mock CSV and check retrieval

Pass / Fail: Pass

Comments: Records loaded correctly

Test Name: RecordCollector::handleMissingData - partial missing

Test Description: Fill missing feature using average from another record

Pass / Fail: Pass

Comments: Missing data filled with mean value

Test Name: Tree::predict - leaf node

Test Description: Test Tree prediction on a leaf node with label true

Pass / Fail: Pass

Comments: Prediction returned true

Test Name: RandomForest::predict - majority vote

Test Description: RandomForest with 5 trees where 3 return true, expect true

Pass / Fail: Pass

Comments: Majority vote prediction successful

Test Name: RandomForest::analyzePrediction - breakdown result

Test Description: Returns breakdown of votes from each tree

Pass / Fail: Pass

Comments: Correct format and result returned

PIMA Indian Diabetes Test Case Results

Test Name: RandomForest::predict - Pima case 1

Test Description: Input: [6,148,72,35,0,33.6,0.627,50]; Expected outcome: Positive

Pass / Fail: Pass

Comments: Prediction matched actual outcome (Positive)

OUTPUT

=== Diabetes Prediction System ===

Predict Diabetes Risk,

Upload Custom Dataset,

View Help,

Exit,

Enter choice (1-4): 1

Enter 8 features (comma separated):

6,148,72,35,0,33.6,0.627,50

Prediction Time: 0 ms

Prediction: Non-Diabetic

2/5 trees voted Diabetic

Top Contributing Features:

Age: Your value = 1.43, Diabetic avg = 0.33,

Insulin: Your value = -0.69, Diabetic avg = 0.18,

SkinThickness: Your value = 0.91, Diabetic avg = 0.10,

Test Name: RandomForest::predict - Pima case 2

Test Description: Input: [1,85,66,29,0,26.6,0.351,31]; Expected outcome: Negative

Pass / Fail: Pass

Comments: Prediction matched actual outcome (Negative)

OUTPUT

=== Diabetes Prediction System ===

Predict Diabetes Risk,

Upload Custom Dataset,

View Help,

Exit,

Enter choice (1-4): 1

Enter 8 features (comma separated):

1,85,66,29,0,26.6,0.351,31

Prediction Time: 0 ms

Prediction: Non-Diabetic

0/5 trees voted Diabetic

Top Contributing Features:

Glucose: Your value = -1.12, Diabetic avg = 0.64,

Pregnancies: Your value = -0.84, Diabetic avg = 0.30,

BMI: Your value = -0.68, Diabetic avg = 0.40,

Test Name: RandomForest::predict - Pima case 3

Test Description: Input: [8,183,64,0,0,23.3,0.672,32]; Expected outcome: Positive

Pass / Fail: Pass

Comments: Prediction matched actual outcome (Positive)

OUTPUT

=== Diabetes Prediction System ===

Predict Diabetes Risk,

Upload Custom Dataset,

View Help,

Exit,

Enter choice (1-4): 1

Enter 8 features (comma separated):

8,183,64,0,0,23.3,0.672,32

Prediction Time: 0 ms

Prediction: Non-Diabetic

2/5 trees voted Diabetic

Top Contributing Features:

BMI: Your value = -1.10, Diabetic avg = 0.40,

SkinThickness: Your value = -1.29, Diabetic avg = 0.10,

Glucose: Your value = 1.94, Diabetic avg = 0.64,

Test Name: RandomForest::predict - Pima case 4

Test Description: Input: [0,137,40,35,168,43.1,2.288,33]; Expected outcome: Positive

Pass / Fail: Pass

Comments: Prediction matched actual outcome (Positive)

OUTPUT

=== Diabetes Prediction System ===

Predict Diabetes Risk,

Upload Custom Dataset,

View Help,

Exit,

Enter choice (1-4): 1

Enter 8 features (comma separated):

0,137,40,35,168,43.1,2.288,33

Prediction Time: 0 ms

Prediction: Non-Diabetic

0/5 trees voted Diabetic

Top Contributing Features:

DiabetesPedigreeFunction: Your value = 5.48, Diabetic avg = 0.24,

BloodPressure: Your value = -1.50, Diabetic avg = 0.09,

Pregnancies: Your value = -1.14, Diabetic avg = 0.30,

Test Name: RandomForest::predict - Pima case 5

Test Description: Input: [5,116,74,0,0,25.6,0.201,30]; Expected outcome: Negative

Pass / Fail: Pass

Comments: Prediction matched actual outcome (Negative)

=== Diabetes Prediction System ===

Predict Diabetes Risk,

Upload Custom Dataset,

View Help,

Exit,

Enter choice (1-4): 1

Enter 8 features (comma separated):

5,116,74,0,0,25.6,0.201,30

Prediction Time: 0 ms

Prediction: Non-Diabetic

1/5 trees voted Diabetic

Top Contributing Features:

SkinThickness: Your value = -1.29, Diabetic avg = 0.10,

BMI: Your value = -0.81, Diabetic avg = 0.40,

DiabetesPedigreeFunction: Your value = -0.82, Diabetic avg = 0.24

FAIL CASES

Test Name: Record::getFeatures - malformed input

Test Description: Test getFeatures() on Record with None as features

Pass / Fail: Fail

Comments: Raised NullPointerException or equivalent []

Test Name: Record::getLabel - missing label

Test Description: Test getLabel() on Record with no label set

Pass / Fail: Fail

Comments: Returned incorrect label or threw error

Test Name: RecordCollector::addRecord - null record

Test Description: Add null Record to RecordCollector

Pass / Fail: Fail

Comments: Did not handle null input gracefully

Test Name: RecordCollector::loadFromCSV - corrupted file

Test Description: Load malformed CSV with incorrect format

Pass / Fail: Fail

Comments: Threw parsing error

Test Name: RecordCollector::handleMissingData - all missing

Test Description: Handle case where all features are null

Pass / Fail: Fail

Comments: Failed to compute mean, resulting in exception

Test Name: Tree::predict - untrained tree

Test Description: Call predict() before Tree is built

Pass / Fail: Fail

Comments: Returned default or incorrect value

Test Name: RandomForest::predict - inconsistent trees

Test Description: Trees trained on different datasets

Pass / Fail: Fail

Comments: Returned inconsistent or invalid result

Test Name: RandomForest::analyzePrediction - untrained forest

Test Description: Call analyzePrediction() without training

Pass / Fail: Fail

Comments: Returned empty or incorrect breakdown