

Parul University

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Department: ITB_Batch 2

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PIET_Machine learning using python_Course

PIET_ML_Session 6_ID3_CY

Attempt : 1

Total Mark : 30

Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Rahul, a clinical data scientist, is collaborating with a hospital to automate early detection of heart disease using patient health records. Each record includes numerical features such as age, cholesterol level, and resting blood pressure. Rahul must build a decision tree classifier using the ID3 algorithm (entropy-based criterion) that handles numeric threshold-based splits and restricts the tree depth to 4.

Write a program to ensure that the model predicts heart disease (binary classification from the target column) and evaluates its performance using accuracy, confusion matrix, and a classification report after a 70-30 train-test split.

Answer

main.py

```
import pandas as pd
import numpy as np
import os
import sys
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import confusion_matrix, classification_report,
accuracy_score
```

```
# Load dataset
file_name = input().strip()
file_path = os.path.join(sys.path[0], file_name)
data = pd.read_csv(file_path)
```

```
# Separate features and target
X = data.drop(columns=['target']).values
y = data['target'].values
```

```
# Train-test split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
random_state=42)
```

```
# Initialize Decision Tree (using entropy = ID3)
clf = DecisionTreeClassifier(criterion='entropy', max_depth=4, random_state=42)
clf.fit(X_train, y_train)
```

```
# Predict
y_pred = clf.predict(X_test)
```

```
# Evaluate
accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy : {accuracy:.2f}")
```

```
print("\nConfusion Matrix:")
print(confusion_matrix(y_test, y_pred))
```

```
print("\nClassification Report:")
print(classification_report(y_test, y_pred, zero_division=0))
```

sample1.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

63,1,3,145,233,1,0,150,0,2.3,0,0,1,1
37,1,2,130,250,0,1,187,0,3.5,0,0,2,1
41,0,1,130,204,0,0,172,0,1.4,2,0,2,1
56,1,1,120,236,0,1,178,0,0.8,2,0,2,1
57,0,0,120,354,0,1,163,1,0.6,2,0,2,1
57,1,0,140,192,0,1,148,0,0.4,1,0,1,1
56,0,1,140,294,0,0,153,0,1.3,1,0,2,1
44,1,1,120,263,0,1,173,0,0,2,0,3,1
52,1,2,172,199,1,1,162,0,0.5,2,0,3,1
57,1,2,150,168,0,1,174,0,1.6,2,0,2,1
54,1,0,140,239,0,1,160,0,1.2,2,0,2,1
48,0,2,130,275,0,1,139,0,0.2,2,0,2,1
49,1,1,130,266,0,1,171,0,0.6,2,0,2,1
64,1,3,110,211,0,0,144,1,1.8,1,0,2,1
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43,1,0,150,247,0,1,171,0,1.5,2,0,2,1
69,0,3,140,239,0,1,151,0,1.8,2,2,2,1
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44,1,2,130,233,0,1,179,1,0.4,2,0,2,1
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56,0,0,134,409,0,0,150,1,1.9,1,2,3,0
66,1,1,160,246,0,1,120,1,0,1,3,1,0
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69,1,2,140,254,0,0,146,0,2,1,3,3,0
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62,0,0,150,244,0,1,154,1,1.4,1,0,2,0
38,1,3,120,231,0,1,182,1,3.8,1,0,3,0
66,0,0,178,228,1,1,165,1,1,1,2,3,0
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61,1,3,134,234,0,1,145,0,2.6,1,2,2,0
67,1,0,120,237,0,1,71,0,1,1,0,2,0
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sample2.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

63,1,3,145,233,1,0,150,0,2.3,0,0,1,1
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easy1.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

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59,0,0,174,249,0,1,143,1,0,1,0,2,0
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57,1,0,152,274,0,1,88,1,1,2,1,1,3,0
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48,1,0,124,274,0,0,166,0,0,5,1,0,3,0
56,0,0,134,409,0,0,150,1,1,9,1,2,3,0
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easy2.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

63,1,3,145,233,1,0,150,0,2.3,0,0,1,1
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62,0,0,138,294,1,1,106,0,1.9,1,3,2,0
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medium1.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

63,1,3,145,233,1,0,150,0,2.3,0,0,1,1
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62,0,0,150,244,0,1,154,1,1,4,1,0,2,0
38,1,3,120,231,0,1,182,1,3,8,1,0,3,0
66,0,0,178,228,1,1,165,1,1,1,2,3,0
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46,1,0,120,249,0,0,144,0,0,8,2,0,3,0
61,1,3,134,234,0,1,145,0,2,6,1,2,2,0
67,1,0,120,237,0,1,71,0,1,1,0,2,0

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47,1,0,110,275,0,0,118,1,1,1,1,2,0
52,1,0,125,212,0,1,168,0,1,2,2,3,0
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58,0,1,136,319,1,0,152,0,0,2,2,2,0
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63,1,0,140,187,0,0,144,1,4,2,2,3,0
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medium2.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

63,1,3,145,233,1,0,150,0,2.3,0,0,1,1
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69,0,3,140,239,0,1,151,0,1.8,2,2,2,1
59,1,0,135,234,0,1,161,0,0.5,1,0,3,1
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hard1.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

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46,1,0,120,249,0,0,144,0,0,8,2,0,3,0
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hard2.csv

age,sex,cp,trestbps,chol,fbs,restecg,thalach,exang,oldpeak,slope,ca,thal,target

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62,0,0,150,244,0,1,154,1,1.4,1,0,2,0
38,1,3,120,231,0,1,182,1,3.8,1,0,3,0

66,0,0,178,228,1,1,165,1,1,1,2,3,0
52,1,0,112,230,0,1,160,0,0,2,1,2,0
53,1,0,123,282,0,1,95,1,2,1,2,3,0
63,0,0,108,269,0,1,169,1,1,8,1,2,2,0
54,1,0,110,206,0,0,108,1,0,1,1,2,0
66,1,0,112,212,0,0,132,1,0,1,2,1,2,0
55,0,0,180,327,0,2,117,1,3,4,1,0,2,0
49,1,2,118,149,0,0,126,0,0,8,2,3,2,0
54,1,0,122,286,0,0,116,1,3,2,1,2,2,0
56,1,0,130,283,1,0,103,1,1,6,0,0,3,0
46,1,0,120,249,0,0,144,0,0,8,2,0,3,0
61,1,3,134,234,0,1,145,0,2,6,1,2,2,0
67,1,0,120,237,0,1,71,0,1,1,0,2,0
58,1,0,100,234,0,1,156,0,0,1,2,1,3,0
47,1,0,110,275,0,0,118,1,1,1,1,2,0
52,1,0,125,212,0,1,168,0,1,2,2,3,0
58,1,0,146,218,0,1,105,0,2,1,1,3,0
57,1,1,124,261,0,1,141,0,0,3,2,0,3,0
58,0,1,136,319,1,0,152,0,0,2,2,2,0
61,1,0,138,166,0,0,125,1,3,6,1,1,2,0
42,1,0,136,315,0,1,125,1,1,8,1,0,1,0
52,1,0,128,204,1,1,156,1,1,1,0,0,0
59,1,2,126,218,1,1,134,0,2,2,1,1,1,0
40,1,0,152,223,0,1,181,0,0,2,0,3,0
61,1,0,140,207,0,0,138,1,1,9,2,1,3,0
46,1,0,140,311,0,1,120,1,1,8,1,2,3,0
59,1,3,134,204,0,1,162,0,0,8,2,2,2,0
57,1,1,154,232,0,0,164,0,0,2,1,2,0
57,1,0,110,335,0,1,143,1,3,1,1,3,0
55,0,0,128,205,0,2,130,1,2,1,1,3,0
61,1,0,148,203,0,1,161,0,0,2,1,3,0
58,1,0,114,318,0,2,140,0,4,4,0,3,1,0
58,0,0,170,225,1,0,146,1,2,8,1,2,1,0
67,1,2,152,212,0,0,150,0,0,8,1,0,3,0
44,1,0,120,169,0,1,144,1,2,8,0,0,1,0
63,1,0,140,187,0,0,144,1,4,2,2,3,0
63,0,0,124,197,0,1,136,1,0,1,0,2,0
59,1,0,164,176,1,0,90,0,1,1,2,1,0
57,0,0,140,241,0,1,123,1,0,2,1,0,3,0
45,1,3,110,264,0,1,132,0,1,2,1,0,3,0
68,1,0,144,193,1,1,141,0,3,4,1,2,3,0
57,1,0,130,131,0,1,115,1,1,2,1,1,3,0

57,0,1,130,236,0,0,174,0,0,1,1,2,0

Status : Correct

Marks : 10/10

2. Problem Statement

Priya, a medical data analyst, is developing a clinical decision support tool to predict the onset of diabetes using patient health records. The records include numerical features such as glucose level, blood pressure, and BMI, some of which may contain invalid zero values. Priya must clean the dataset by replacing these zeros with the median of each respective column. She then needs to train an ID3 decision tree classifier (using entropy-based splits) with a maximum depth of 4 to classify whether a patient has diabetes (based on the Outcome column).

Write a program to ensure that the model is trained on the cleaned data, evaluated on a test set, and outputs the prediction accuracy, confusion matrix, and a classification report.

Answer

main.py

```
import pandas as pd
import numpy as np
import os
import sys
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import confusion_matrix, classification_report,
accuracy_score

# Load CSV
file_name = input().strip()
data = pd.read_csv(os.path.join(sys.path[0], file_name))

# Replace invalid zero entries with median (for specific features)
replace_zero_cols = ['Glucose', 'BloodPressure', 'SkinThickness', 'Insulin', 'BMI']
for col in replace_zero_cols:
    data[col] = data[col].replace(0, np.nan)
    data[col].fillna(data[col].median(), inplace=True)
```

```
# Features and target
```

```
X = data.drop(columns=['Outcome']).values
```

```
y = data['Outcome'].values
```

```
# Train-test split
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,  
random_state=42)
```

```
# Train the Decision Tree using entropy (ID3-like)
```

```
clf = DecisionTreeClassifier(criterion='entropy', max_depth=4, random_state=42)
```

```
clf.fit(X_train, y_train)
```

```
# Predict
```

```
y_pred = clf.predict(X_test)
```

```
# Accuracy
```

```
accuracy = accuracy_score(y_test, y_pred)
```

```
print(f"Accuracy : {accuracy:.2f}")
```

```
# Confusion matrix
```

```
print("\nConfusion Matrix:")
```

```
print(confusion_matrix(y_test, y_pred))
```

```
# Classification report
```

```
print("\nClassification Report:")
```

```
print(classification_report(y_test, y_pred, zero_division=0))
```

```
sample1.csv
```

```
Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree  
Function,Age,Outcome
```

```
6,148,72,35,0,33.6,0.627,50,1
```

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

```
8,183,64,0,0,23.3,0.672,32,1
```

```
1,89,66,23,94,28.1,0.167,21,0
```

```
0,137,40,35,168,43.1,2.288,33,1
```

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

```
3,78,50,32,88,31,0.248,26,1
```

```
10,115,0,0,0,35.3,0.134,29,0
```

```
2,197,70,45,543,30.5,0.158,53,1
```

```
8,125,96,0,0,0,0.232,54,1
```

```
4,110,92,0,0,37.6,0.191,30,0
```

10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0

sample2.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1

7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1

0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0

easy1.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0

5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42.1,893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1
0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1

5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0
0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0
4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0
1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0
2,85,65,0,0,39.6,0.93,27,0
1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0

4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1
1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0
2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0
5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0
9,57,80,37,0,32.8,0.096,41,0
2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1

7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0
4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1

easy2.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0

8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1
0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0

2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1
5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0
0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0
4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0
1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0
2,85,65,0,0,39.6,0.93,27,0

1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0
4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1
1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0
2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0
5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0
9,57,80,37,0,32.8,0.096,41,0

2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1
7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0
4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1
2,87,0,23,0,28.9,0.773,25,0
1,79,60,42,48,43.5,0.678,23,0
2,75,64,24,55,29.7,0.37,33,0
8,179,72,42,130,32.7,0.719,36,1
6,85,78,0,0,31.2,0.382,42,0
0,129,110,46,130,67.1,0.319,26,1
5,143,78,0,0,45,0.19,47,0
5,130,82,0,0,39.1,0.956,37,1
6,87,80,0,0,23.2,0.084,32,0
0,119,64,18,92,34.9,0.725,23,0
1,0,74,20,23,27.7,0.299,21,0
5,73,60,0,0,26.8,0.268,27,0
4,141,74,0,0,27.6,0.244,40,0
7,194,68,28,0,35.9,0.745,41,1
8,181,68,36,495,30.1,0.615,60,1
1,128,98,41,58,32.1,321,33,1
8,109,76,39,114,27.9,0.64,31,1

5,139,80,35,160,31.6,0.361,25,1
3,111,62,0,0,22.6,0.142,21,0
9,123,70,44,94,33.1,0.374,40,0
7,159,66,0,0,30.4,0.383,36,1
11,135,0,0,0,52.3,0.578,40,1
8,85,55,20,0,24.4,0.136,42,0
5,158,84,41,210,39.4,0.395,29,1
1,105,58,0,0,24.3,0.187,21,0
3,107,62,13,48,22.9,0.678,23,1
4,109,64,44,99,34.8,0.905,26,1
4,148,60,27,318,30.9,0.15,29,1
0,113,80,16,0,31,0.874,21,0
1,138,82,0,0,40.1,0.236,28,0
0,108,68,20,0,27.3,0.787,32,0
2,99,70,16,44,20.4,0.235,27,0
6,103,72,32,190,37.7,0.324,55,0
5,111,72,28,0,23.9,0.407,27,0
8,196,76,29,280,37.5,0.605,57,1

medium1.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1

3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1
0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1

5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1
5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0
0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0
4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0
1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0

2,85,65,0,0,39.6,0.93,27,0
1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0
4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1
1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0
2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0
5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0

9,57,80,37,0,32.8,0.096,41,0
2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1
7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0
4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1
2,87,0,23,0,28.9,0.773,25,0
1,79,60,42,48,43.5,0.678,23,0
2,75,64,24,55,29.7,0.37,33,0
8,179,72,42,130,32.7,0.719,36,1
6,85,78,0,0,31.2,0.382,42,0
0,129,110,46,130,67.1,0.319,26,1
5,143,78,0,0,45,0.19,47,0
5,130,82,0,0,39.1,0.956,37,1
6,87,80,0,0,23.2,0.084,32,0
0,119,64,18,92,34.9,0.725,23,0
1,0,74,20,23,27.7,0.299,21,0
5,73,60,0,0,26.8,0.268,27,0
4,141,74,0,0,27.6,0.244,40,0
7,194,68,28,0,35.9,0.745,41,1
8,181,68,36,495,30.1,0.615,60,1
1,128,98,41,58,32,1.321,33,1

8,109,76,39,114,27.9,0.64,31,1
5,139,80,35,160,31.6,0.361,25,1
3,111,62,0,0,22.6,0.142,21,0
9,123,70,44,94,33.1,0.374,40,0
7,159,66,0,0,30.4,0.383,36,1
11,135,0,0,0,52.3,0.578,40,1
8,85,55,20,0,24.4,0.136,42,0
5,158,84,41,210,39.4,0.395,29,1
1,105,58,0,0,24.3,0.187,21,0
3,107,62,13,48,22.9,0.678,23,1
4,109,64,44,99,34.8,0.905,26,1
4,148,60,27,318,30.9,0.15,29,1
0,113,80,16,0,31,0.874,21,0
1,138,82,0,0,40.1,0.236,28,0
0,108,68,20,0,27.3,0.787,32,0
2,99,70,16,44,20.4,0.235,27,0
6,103,72,32,190,37.7,0.324,55,0
5,111,72,28,0,23.9,0.407,27,0
8,196,76,29,280,37.5,0.605,57,1
5,162,104,0,0,37.7,0.151,52,1
1,96,64,27,87,33.2,0.289,21,0
7,184,84,33,0,35.5,0.355,41,1
2,81,60,22,0,27.7,0.29,25,0
0,147,85,54,0,42.8,0.375,24,0
7,179,95,31,0,34.2,0.164,60,0
0,140,65,26,130,42.6,0.431,24,1
9,112,82,32,175,34.2,0.26,36,1
12,151,70,40,271,41.8,0.742,38,1
5,109,62,41,129,35.8,0.514,25,1
6,125,68,30,120,30,0.464,32,0
5,85,74,22,0,29,1.224,32,1
5,112,66,0,0,37.8,0.261,41,1
0,177,60,29,478,34.6,1.072,21,1
2,158,90,0,0,31.6,0.805,66,1
7,119,0,0,0,25.2,0.209,37,0
7,142,60,33,190,28.8,0.687,61,0
1,100,66,15,56,23.6,0.666,26,0
1,87,78,27,32,34.6,0.101,22,0
0,101,76,0,0,35.7,0.198,26,0
3,162,52,38,0,37.2,0.652,24,1
4,197,70,39,744,36.7,2.329,31,0
0,117,80,31,53,45.2,0.089,24,0

4,142,86,0,0,44,0.645,22,1
6,134,80,37,370,46.2,0.238,46,1
1,79,80,25,37,25.4,0.583,22,0
4,122,68,0,0,35,0.394,29,0
3,74,68,28,45,29.7,0.293,23,0
4,171,72,0,0,43.6,0.479,26,1
7,181,84,21,192,35.9,0.586,51,1
0,179,90,27,0,44.1,0.686,23,1
9,164,84,21,0,30.8,0.831,32,1
0,104,76,0,0,18.4,0.582,27,0
1,91,64,24,0,29.2,0.192,21,0
4,91,70,32,88,33.1,0.446,22,0
3,139,54,0,0,25.6,0.402,22,1
6,119,50,22,176,27.1,1.318,33,1
2,146,76,35,194,38.2,0.329,29,0
9,184,85,15,0,30,1.213,49,1
10,122,68,0,0,31.2,0.258,41,0
0,165,90,33,680,52.3,0.427,23,0
9,124,70,33,402,35.4,0.282,34,0
1,111,86,19,0,30.1,0.143,23,0
9,106,52,0,0,31.2,0.38,42,0
2,129,84,0,0,28,0.284,27,0
2,90,80,14,55,24.4,0.249,24,0
0,86,68,32,0,35.8,0.238,25,0
12,92,62,7,258,27.6,0.926,44,1
1,113,64,35,0,33.6,0.543,21,1
3,111,56,39,0,30.1,0.557,30,0
2,114,68,22,0,28.7,0.092,25,0
1,193,50,16,375,25.9,0.655,24,0
11,155,76,28,150,33.3,1.353,51,1
3,191,68,15,130,30.9,0.299,34,0
3,141,0,0,0,30,0.761,27,1
4,95,70,32,0,32.1,0.612,24,0
3,142,80,15,0,32.4,0.2,63,0
4,123,62,0,0,32,0.226,35,1
5,96,74,18,67,33.6,0.997,43,0
0,138,0,0,0,36.3,0.933,25,1
2,128,64,42,0,40,1.101,24,0
0,102,52,0,0,25.1,0.078,21,0
2,146,0,0,0,27.5,0.24,28,1
10,101,86,37,0,45.6,1.136,38,1
2,108,62,32,56,25.2,0.128,21,0

3,122,78,0,0,23,0.254,40,0
1,71,78,50,45,33.2,0.422,21,0
13,106,70,0,0,34.2,0.251,52,0
2,100,70,52,57,40.5,0.677,25,0
7,106,60,24,0,26.5,0.296,29,1
0,104,64,23,116,27.8,0.454,23,0
5,114,74,0,0,24.9,0.744,57,0
2,108,62,10,278,25.3,0.881,22,0
0,146,70,0,0,37.9,0.334,28,1
10,129,76,28,122,35.9,0.28,39,0
7,133,88,15,155,32.4,0.262,37,0
7,161,86,0,0,30.4,0.165,47,1
2,108,80,0,0,27,0.259,52,1
7,136,74,26,135,26,0.647,51,0
5,155,84,44,545,38.7,0.619,34,0
1,119,86,39,220,45.6,0.808,29,1
4,96,56,17,49,20.8,0.34,26,0
5,108,72,43,75,36.1,0.263,33,0
0,78,88,29,40,36.9,0.434,21,0
0,107,62,30,74,36.6,0.757,25,1
2,128,78,37,182,43.3,1.224,31,1
1,128,48,45,194,40.5,0.613,24,1
0,161,50,0,0,21.9,0.254,65,0

medium2.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1

7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1

0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1
5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0
0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0
4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0

1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0
2,85,65,0,0,39.6,0.93,27,0
1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0
4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1
1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0
2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0

5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0
9,57,80,37,0,32.8,0.096,41,0
2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1
7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29.0,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0
4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1
2,87,0,23,0,28.9,0.773,25,0
1,79,60,42,48,43.5,0.678,23,0
2,75,64,24,55,29.7,0.37,33,0
8,179,72,42,130,32.7,0.719,36,1
6,85,78,0,0,31.2,0.382,42,0
0,129,110,46,130,67.1,0.319,26,1
5,143,78,0,0,45,0.19,47,0
5,130,82,0,0,39.1,0.956,37,1
6,87,80,0,0,23.2,0.084,32,0
0,119,64,18,92,34.9,0.725,23,0
1,0,74,20,23,27.7,0.299,21,0

5,73,60,0,0,26.8,0.268,27,0
4,141,74,0,0,27.6,0.244,40,0
7,194,68,28,0,35.9,0.745,41,1
8,181,68,36,495,30.1,0.615,60,1
1,128,98,41,58,32,1.321,33,1
8,109,76,39,114,27.9,0.64,31,1
5,139,80,35,160,31.6,0.361,25,1
3,111,62,0,0,22.6,0.142,21,0
9,123,70,44,94,33.1,0.374,40,0
7,159,66,0,0,30.4,0.383,36,1
11,135,0,0,0,52.3,0.578,40,1
8,85,55,20,0,24.4,0.136,42,0
5,158,84,41,210,39.4,0.395,29,1
1,105,58,0,0,24.3,0.187,21,0
3,107,62,13,48,22.9,0.678,23,1
4,109,64,44,99,34.8,0.905,26,1
4,148,60,27,318,30.9,0.15,29,1
0,113,80,16,0,31,0.874,21,0
1,138,82,0,0,40.1,0.236,28,0
0,108,68,20,0,27.3,0.787,32,0
2,99,70,16,44,20.4,0.235,27,0
6,103,72,32,190,37.7,0.324,55,0
5,111,72,28,0,23.9,0.407,27,0
8,196,76,29,280,37.5,0.605,57,1
5,162,104,0,0,37.7,0.151,52,1
1,96,64,27,87,33.2,0.289,21,0
7,184,84,33,0,35.5,0.355,41,1
2,81,60,22,0,27.7,0.29,25,0
0,147,85,54,0,42.8,0.375,24,0
7,179,95,31,0,34.2,0.164,60,0
0,140,65,26,130,42.6,0.431,24,1
9,112,82,32,175,34.2,0.26,36,1
12,151,70,40,271,41.8,0.742,38,1
5,109,62,41,129,35.8,0.514,25,1
6,125,68,30,120,30,0.464,32,0
5,85,74,22,0,29,1.224,32,1
5,112,66,0,0,37.8,0.261,41,1
0,177,60,29,478,34.6,1.072,21,1
2,158,90,0,0,31.6,0.805,66,1
7,119,0,0,0,25.2,0.209,37,0
7,142,60,33,190,28.8,0.687,61,0
1,100,66,15,56,23.6,0.666,26,0

1,87,78,27,32,34.6,0.101,22,0
0,101,76,0,0,35.7,0.198,26,0
3,162,52,38,0,37.2,0.652,24,1
4,197,70,39,744,36.7,2.329,31,0
0,117,80,31,53,45.2,0.089,24,0
4,142,86,0,0,44,0.645,22,1
6,134,80,37,370,46.2,0.238,46,1
1,79,80,25,37,25.4,0.583,22,0
4,122,68,0,0,35,0.394,29,0
3,74,68,28,45,29.7,0.293,23,0
4,171,72,0,0,43.6,0.479,26,1
7,181,84,21,192,35.9,0.586,51,1
0,179,90,27,0,44.1,0.686,23,1
9,164,84,21,0,30.8,0.831,32,1
0,104,76,0,0,18.4,0.582,27,0
1,91,64,24,0,29.2,0.192,21,0
4,91,70,32,88,33.1,0.446,22,0
3,139,54,0,0,25.6,0.402,22,1
6,119,50,22,176,27.1,1.318,33,1
2,146,76,35,194,38.2,0.329,29,0
9,184,85,15,0,30,1.213,49,1
10,122,68,0,0,31.2,0.258,41,0
0,165,90,33,680,52.3,0.427,23,0
9,124,70,33,402,35.4,0.282,34,0
1,111,86,19,0,30.1,0.143,23,0
9,106,52,0,0,31.2,0.38,42,0
2,129,84,0,0,28,0.284,27,0
2,90,80,14,55,24.4,0.249,24,0
0,86,68,32,0,35.8,0.238,25,0
12,92,62,7,258,27.6,0.926,44,1
1,113,64,35,0,33.6,0.543,21,1
3,111,56,39,0,30.1,0.557,30,0
2,114,68,22,0,28.7,0.092,25,0
1,193,50,16,375,25.9,0.655,24,0
11,155,76,28,150,33.3,1.353,51,1
3,191,68,15,130,30.9,0.299,34,0
3,141,0,0,0,30,0.761,27,1
4,95,70,32,0,32.1,0.612,24,0
3,142,80,15,0,32.4,0.2,63,0
4,123,62,0,0,32,0.226,35,1
5,96,74,18,67,33.6,0.997,43,0
0,138,0,0,0,36.3,0.933,25,1

2,128,64,42,0,40,1.101,24,0
0,102,52,0,0,25.1,0.078,21,0
2,146,0,0,0,27.5,0.24,28,1
10,101,86,37,0,45.6,1.136,38,1
2,108,62,32,56,25.2,0.128,21,0
3,122,78,0,0,23,0.254,40,0
1,71,78,50,45,33.2,0.422,21,0
13,106,70,0,0,34.2,0.251,52,0
2,100,70,52,57,40.5,0.677,25,0
7,106,60,24,0,26.5,0.296,29,1
0,104,64,23,116,27.8,0.454,23,0
5,114,74,0,0,24.9,0.744,57,0
2,108,62,10,278,25.3,0.881,22,0
0,146,70,0,0,37.9,0.334,28,1
10,129,76,28,122,35.9,0.28,39,0
7,133,88,15,155,32.4,0.262,37,0
7,161,86,0,0,30.4,0.165,47,1
2,108,80,0,0,27,0.259,52,1
7,136,74,26,135,26,0.647,51,0
5,155,84,44,545,38.7,0.619,34,0
1,119,86,39,220,45.6,0.808,29,1
4,96,56,17,49,20.8,0.34,26,0
5,108,72,43,75,36.1,0.263,33,0
0,78,88,29,40,36.9,0.434,21,0
0,107,62,30,74,36.6,0.757,25,1
2,128,78,37,182,43.3,1.224,31,1
1,128,48,45,194,40.5,0.613,24,1
0,161,50,0,0,21.9,0.254,65,0
6,151,62,31,120,35.5,0.692,28,0
2,146,70,38,360,28,0.337,29,1
0,126,84,29,215,30.7,0.52,24,0
14,100,78,25,184,36.6,0.412,46,1
8,112,72,0,0,23.6,0.84,58,0
0,167,0,0,0,32.3,0.839,30,1
2,144,58,33,135,31.6,0.422,25,1
5,77,82,41,42,35.8,0.156,35,0
5,115,98,0,0,52.9,0.209,28,1
3,150,76,0,0,21,0.207,37,0
2,120,76,37,105,39.7,0.215,29,0
10,161,68,23,132,25.5,0.326,47,1
0,137,68,14,148,24.8,0.143,21,0
0,128,68,19,180,30.5,1.391,25,1

2,124,68,28,205,32.9,0.875,30,1
6,80,66,30,0,26.2,0.313,41,0
0,106,70,37,148,39.4,0.605,22,0
2,155,74,17,96,26.6,0.433,27,1
3,113,50,10,85,29.5,0.626,25,0
7,109,80,31,0,35.9,1.127,43,1
2,112,68,22,94,34.1,0.315,26,0
3,99,80,11,64,19.3,0.284,30,0
3,182,74,0,0,30.5,0.345,29,1
3,115,66,39,140,38.1,0.15,28,0
6,194,78,0,0,23.5,0.129,59,1
4,129,60,12,231,27.5,0.527,31,0
3,112,74,30,0,31.6,0.197,25,1
0,124,70,20,0,27.4,0.254,36,1
13,152,90,33,29,26.8,0.731,43,1
2,112,75,32,0,35.7,0.148,21,0
1,157,72,21,168,25.6,0.123,24,0
1,122,64,32,156,35.1,0.692,30,1
10,179,70,0,0,35.1,0.2,37,0
2,102,86,36,120,45.5,0.127,23,1
6,105,70,32,68,30.8,0.122,37,0
8,118,72,19,0,23.1,1.476,46,0
2,87,58,16,52,32.7,0.166,25,0
1,180,0,0,0,43.3,0.282,41,1
12,106,80,0,0,23.6,0.137,44,0
1,95,60,18,58,23.9,0.26,22,0
0,165,76,43,255,47.9,0.259,26,0
0,117,0,0,0,33.8,0.932,44,0
5,115,76,0,0,31.2,0.343,44,1
9,152,78,34,171,34.2,0.893,33,1
7,178,84,0,0,39.9,0.331,41,1
1,130,70,13,105,25.9,0.472,22,0
1,95,74,21,73,25.9,0.673,36,0
1,0,68,35,0,32,0.389,22,0
5,122,86,0,0,34.7,0.29,33,0
8,95,72,0,0,36.8,0.485,57,0
8,126,88,36,108,38.5,0.349,49,0
1,139,46,19,83,28.7,0.654,22,0
3,116,0,0,0,23.5,0.187,23,0

hard1.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree

Function, Age, Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1
8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0

7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0
1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1
0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1
5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0

0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0
4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0
1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0
2,85,65,0,0,39.6,0.93,27,0
1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0
4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1

1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0
2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0
5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0
9,57,80,37,0,32.8,0.096,41,0
2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1
7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0

4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1
2,87,0,23,0,28.9,0.773,25,0
1,79,60,42,48,43.5,0.678,23,0
2,75,64,24,55,29.7,0.37,33,0
8,179,72,42,130,32.7,0.719,36,1
6,85,78,0,0,31.2,0.382,42,0
0,129,110,46,130,67.1,0.319,26,1
5,143,78,0,0,45,0.19,47,0
5,130,82,0,0,39.1,0.956,37,1
6,87,80,0,0,23.2,0.084,32,0
0,119,64,18,92,34.9,0.725,23,0
1,0,74,20,23,27.7,0.299,21,0
5,73,60,0,0,26.8,0.268,27,0
4,141,74,0,0,27.6,0.244,40,0
7,194,68,28,0,35.9,0.745,41,1
8,181,68,36,495,30.1,0.615,60,1
1,128,98,41,58,32,1.321,33,1
8,109,76,39,114,27.9,0.64,31,1
5,139,80,35,160,31.6,0.361,25,1
3,111,62,0,0,22.6,0.142,21,0
9,123,70,44,94,33.1,0.374,40,0
7,159,66,0,0,30.4,0.383,36,1
11,135,0,0,0,52.3,0.578,40,1
8,85,55,20,0,24.4,0.136,42,0
5,158,84,41,210,39.4,0.395,29,1
1,105,58,0,0,24.3,0.187,21,0
3,107,62,13,48,22.9,0.678,23,1
4,109,64,44,99,34.8,0.905,26,1
4,148,60,27,318,30.9,0.15,29,1
0,113,80,16,0,31,0.874,21,0
1,138,82,0,0,40.1,0.236,28,0
0,108,68,20,0,27.3,0.787,32,0
2,99,70,16,44,20.4,0.235,27,0
6,103,72,32,190,37.7,0.324,55,0
5,111,72,28,0,23.9,0.407,27,0
8,196,76,29,280,37.5,0.605,57,1
5,162,104,0,0,37.7,0.151,52,1
1,96,64,27,87,33.2,0.289,21,0

7,184,84,33,0,35.5,0.355,41,1
2,81,60,22,0,27.7,0.29,25,0
0,147,85,54,0,42.8,0.375,24,0
7,179,95,31,0,34.2,0.164,60,0
0,140,65,26,130,42.6,0.431,24,1
9,112,82,32,175,34.2,0.26,36,1
12,151,70,40,271,41.8,0.742,38,1
5,109,62,41,129,35.8,0.514,25,1
6,125,68,30,120,30,0.464,32,0
5,85,74,22,0,29,1.224,32,1
5,112,66,0,0,37.8,0.261,41,1
0,177,60,29,478,34.6,1.072,21,1
2,158,90,0,0,31.6,0.805,66,1
7,119,0,0,0,25.2,0.209,37,0
7,142,60,33,190,28.8,0.687,61,0
1,100,66,15,56,23.6,0.666,26,0
1,87,78,27,32,34.6,0.101,22,0
0,101,76,0,0,35.7,0.198,26,0
3,162,52,38,0,37.2,0.652,24,1
4,197,70,39,744,36.7,2.329,31,0
0,117,80,31,53,45.2,0.089,24,0
4,142,86,0,0,44,0.645,22,1
6,134,80,37,370,46.2,0.238,46,1
1,79,80,25,37,25.4,0.583,22,0
4,122,68,0,0,35,0.394,29,0
3,74,68,28,45,29.7,0.293,23,0
4,171,72,0,0,43.6,0.479,26,1
7,181,84,21,192,35.9,0.586,51,1
0,179,90,27,0,44.1,0.686,23,1
9,164,84,21,0,30.8,0.831,32,1
0,104,76,0,0,18.4,0.582,27,0
1,91,64,24,0,29.2,0.192,21,0
4,91,70,32,88,33.1,0.446,22,0
3,139,54,0,0,25.6,0.402,22,1
6,119,50,22,176,27.1,1.318,33,1
2,146,76,35,194,38.2,0.329,29,0
9,184,85,15,0,30,1.213,49,1
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0,165,90,33,680,52.3,0.427,23,0
9,124,70,33,402,35.4,0.282,34,0
1,111,86,19,0,30.1,0.143,23,0
9,106,52,0,0,31.2,0.38,42,0

2,129,84,0,0,28,0.284,27,0
2,90,80,14,55,24.4,0.249,24,0
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12,92,62,7,258,27.6,0.926,44,1
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2,114,68,22,0,28.7,0.092,25,0
1,193,50,16,375,25.9,0.655,24,0
11,155,76,28,150,33.3,1.353,51,1
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4,123,62,0,0,32,0.226,35,1
5,96,74,18,67,33.6,0.997,43,0
0,138,0,0,0,36.3,0.933,25,1
2,128,64,42,0,40,1.101,24,0
0,102,52,0,0,25.1,0.078,21,0
2,146,0,0,0,27.5,0.24,28,1
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3,122,78,0,0,23,0.254,40,0
1,71,78,50,45,33.2,0.422,21,0
13,106,70,0,0,34.2,0.251,52,0
2,100,70,52,57,40.5,0.677,25,0
7,106,60,24,0,26.5,0.296,29,1
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7,133,88,15,155,32.4,0.262,37,0
7,161,86,0,0,30.4,0.165,47,1
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7,136,74,26,135,26,0.647,51,0
5,155,84,44,545,38.7,0.619,34,0
1,119,86,39,220,45.6,0.808,29,1
4,96,56,17,49,20.8,0.34,26,0
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0,78,88,29,40,36.9,0.434,21,0
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1,128,48,45,194,40.5,0.613,24,1
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6,151,62,31,120,35.5,0.692,28,0
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14,100,78,25,184,36.6,0.412,46,1
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0,128,68,19,180,30.5,1.391,25,1
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8,118,72,19,0,23.1,1.476,46,0
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1,180,0,0,0,43.3,0.282,41,1
12,106,80,0,0,23.6,0.137,44,0
1,95,60,18,58,23.9,0.26,22,0

0,165,76,43,255,47.9,0.259,26,0
0,117,0,0,0,33.8,0.932,44,0
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9,152,78,34,171,34.2,0.893,33,1
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1,95,74,21,73,25.9,0.673,36,0
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5,122,86,0,0,34.7,0.29,33,0
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1,139,46,19,83,28.7,0.654,22,0
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3,61,82,28,0,34.4,0.243,46,0
1,90,62,12,43,27.2,0.58,24,0
3,90,78,0,0,42.7,0.559,21,0
9,165,88,0,0,30.4,0.302,49,1
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5,103,108,37,0,39.2,0.305,65,0
4,146,78,0,0,38.5,0.52,67,1
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6,124,72,0,0,27.6,0.368,29,1
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0,84,64,22,66,35.8,0.545,21,0
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12,140,82,43,325,39.2,0.528,58,1
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1,87,60,37,75,37.2,0.509,22,0
4,156,75,0,0,48.3,0.238,32,1
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1,125,70,24,110,24.3,0.221,25,0
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10,148,84,48,237,37.6,1.001,51,1
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9,120,72,22,56,20.8,0.733,48,0

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3,129,92,49,155,36.4,0.968,32,1
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1,84,64,23,115,36.9,0.471,28,0
7,124,70,33,215,25.5,0.161,37,0
1,97,70,40,0,38.1,0.218,30,0
8,110,76,0,0,27.8,0.237,58,0
11,103,68,40,0,46.2,0.126,42,0
11,85,74,0,0,30.1,0.335,0
6,125,76,0,0,33.8,0.121,54,1
0,198,66,32,274,41.3,0.502,28,1
1,87,68,34,77,37.6,0.401,24,0
6,99,60,19,54,26.9,0.497,32,0
0,91,80,0,0,32.4,0.601,27,0
2,95,54,14,88,26.1,0.748,22,0
1,99,72,30,18,38.6,0.412,21,0
6,92,62,32,126,32,0.085,46,0
4,154,72,29,126,31.3,0.338,37,0
0,121,66,30,165,34.3,0.203,33,1
3,78,70,0,0,32.5,0.27,39,0
2,130,96,0,0,22.6,0.268,21,0
3,111,58,31,44,29.5,0.43,22,0
2,98,60,17,120,34.7,0.198,22,0
1,143,86,30,330,30.1,0.892,23,0
1,119,44,47,63,35.5,0.28,25,0
6,108,44,20,130,24,0.813,35,0
2,118,80,0,0,42.9,0.693,21,1
10,133,68,0,0,27,0.245,36,0
2,197,70,99,0,34.7,0.575,62,1
0,151,90,46,0,42.1,0.371,21,1
6,109,60,27,0,25,0.206,27,0
12,121,78,17,0,26.5,0.259,62,0
8,100,76,0,0,38.7,0.19,42,0
8,124,76,24,600,28.7,0.687,52,1
1,93,56,11,0,22.5,0.417,22,0
8,143,66,0,0,34.9,0.129,41,1

6,103,66,0,0,24.3,0.249,29,0
3,176,86,27,156,33.3,1.154,52,1
0,73,0,0,0,21.1,0.342,25,0
11,111,84,40,0,46.8,0.925,45,1
2,112,78,50,140,39.4,0.175,24,0
3,132,80,0,0,34.4,0.402,44,1
2,82,52,22,115,28.5,1.699,25,0
6,123,72,45,230,33.6,0.733,34,0
0,188,82,14,185,32,0.682,22,1
0,67,76,0,0,45.3,0.194,46,0
1,89,24,19,25,27.8,0.559,21,0
1,173,74,0,0,36.8,0.088,38,1
1,109,38,18,120,23.1,0.407,26,0
1,108,88,19,0,27.1,0.4,24,0
6,96,0,0,0,23.7,0.19,28,0
1,124,74,36,0,27.8,0.1,30,0
7,150,78,29,126,35.2,0.692,54,1
4,183,0,0,0,28.4,0.212,36,1
1,124,60,32,0,35.8,0.514,21,0
1,181,78,42,293,40,1.258,22,1
1,92,62,25,41,19.5,0.482,25,0
0,152,82,39,272,41.5,0.27,27,0
1,111,62,13,182,24,0.138,23,0
3,106,54,21,158,30.9,0.292,24,0
3,174,58,22,194,32.9,0.593,36,1
7,168,88,42,321,38.2,0.787,40,1
6,105,80,28,0,32.5,0.878,26,0
11,138,74,26,144,36.1,0.557,50,1
3,106,72,0,0,25.8,0.207,27,0
6,117,96,0,0,28.7,0.157,30,0
2,68,62,13,15,20.1,0.257,23,0
9,112,82,24,0,28.2,1.282,50,1
0,119,0,0,0,32.4,0.141,24,1
2,112,86,42,160,38.4,0.246,28,0
2,92,76,20,0,24.2,1.698,28,0
6,183,94,0,0,40.8,1.461,45,0
0,94,70,27,115,43.5,0.347,21,0
2,108,64,0,0,30.8,0.158,21,0
4,90,88,47,54,37.7,0.362,29,0
0,125,68,0,0,24.7,0.206,21,0
0,132,78,0,0,32.4,0.393,21,0
5,128,80,0,0,34.6,0.144,45,0

4,94,65,22,0,24.7,0.148,21,0
7,114,64,0,0,27.4,0.732,34,1
0,102,78,40,90,34.5,0.238,24,0
2,111,60,0,0,26.2,0.343,23,0
1,128,82,17,183,27.5,0.115,22,0
10,92,62,0,0,25.9,0.167,31,0
13,104,72,0,0,31.2,0.465,38,1
5,104,74,0,0,28.8,0.153,48,0
2,94,76,18,66,31.6,0.649,23,0
7,97,76,32,91,40.9,0.871,32,1
1,100,74,12,46,19.5,0.149,28,0
0,102,86,17,105,29.3,0.695,27,0
4,128,70,0,0,34.3,0.303,24,0
6,147,80,0,0,29.5,0.178,50,1
4,90,0,0,0,28.0,0.61,31,0
3,103,72,30,152,27.6,0.73,27,0
2,157,74,35,440,39.4,0.134,30,0
1,167,74,17,144,23.4,0.447,33,1
0,179,50,36,159,37.8,0.455,22,1
11,136,84,35,130,28.3,0.26,42,1
0,107,60,25,0,26.4,0.133,23,0
1,91,54,25,100,25.2,0.234,23,0
1,117,60,23,106,33.8,0.466,27,0
5,123,74,40,77,34.1,0.269,28,0
2,120,54,0,0,26.8,0.455,27,0
1,106,70,28,135,34.2,0.142,22,0
2,155,52,27,540,38.7,0.24,25,1
2,101,58,35,90,21.8,0.155,22,0
1,120,80,48,200,38.9,1.162,41,0
11,127,106,0,0,39,0.19,51,0
3,80,82,31,70,34.2,1.292,27,1
10,162,84,0,0,27.7,0.182,54,0
1,199,76,43,0,42.9,1.394,22,1
8,167,106,46,231,37.6,0.165,43,1
9,145,80,46,130,37.9,0.637,40,1
6,115,60,39,0,33.7,0.245,40,1
1,112,80,45,132,34.8,0.217,24,0
4,145,82,18,0,32.5,0.235,70,1
10,111,70,27,0,27.5,0.141,40,1
6,98,58,33,190,34,0.43,43,0
9,154,78,30,100,30.9,0.164,45,0
6,165,68,26,168,33.6,0.631,49,0

1,99,58,10,0,25.4,0.551,21,0
10,68,106,23,49,35.5,0.285,47,0
3,123,100,35,240,57.3,0.88,22,0
8,91,82,0,0,35.6,0.587,68,0
6,195,70,0,0,30.9,0.328,31,1
9,156,86,0,0,24.8,0.23,53,1
0,93,60,0,0,35.3,0.263,25,0
3,121,52,0,0,36,0.127,25,1
2,101,58,17,265,24.2,0.614,23,0
2,56,56,28,45,24.2,0.332,22,0
0,162,76,36,0,49.6,0.364,26,1
0,95,64,39,105,44.6,0.366,22,0
4,125,80,0,0,32.3,0.536,27,1
5,136,82,0,0,0,0.64,69,0
2,129,74,26,205,33.2,0.591,25,0
3,130,64,0,0,23.1,0.314,22,0
1,107,50,19,0,28.3,0.181,29,0
1,140,74,26,180,24.1,0.828,23,0
1,144,82,46,180,46.1,0.335,46,1
8,107,80,0,0,24.6,0.856,34,0
13,158,114,0,0,42.3,0.257,44,1
2,121,70,32,95,39.1,0.886,23,0
7,129,68,49,125,38.5,0.439,43,1
2,90,60,0,0,23.5,0.191,25,0
7,142,90,24,480,30.4,0.128,43,1
3,169,74,19,125,29.9,0.268,31,1
0,99,0,0,0,25,0.253,22,0
4,127,88,11,155,34.5,0.598,28,0
4,118,70,0,0,44.5,0.904,26,0

hard2.csv

Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigree
Function,Age,Outcome

6,148,72,35,0,33.6,0.627,50,1
1,85,66,29,0,26.6,0.351,31,0
8,183,64,0,0,23.3,0.672,32,1
1,89,66,23,94,28.1,0.167,21,0
0,137,40,35,168,43.1,2.288,33,1
5,116,74,0,0,25.6,0.201,30,0
3,78,50,32,88,31,0.248,26,1
10,115,0,0,0,35.3,0.134,29,0
2,197,70,45,543,30.5,0.158,53,1

8,125,96,0,0,0,0.232,54,1
4,110,92,0,0,37.6,0.191,30,0
10,168,74,0,0,38,0.537,34,1
10,139,80,0,0,27.1,1.441,57,0
1,189,60,23,846,30.1,0.398,59,1
5,166,72,19,175,25.8,0.587,51,1
7,100,0,0,0,30,0.484,32,1
0,118,84,47,230,45.8,0.551,31,1
7,107,74,0,0,29.6,0.254,31,1
1,103,30,38,83,43.3,0.183,33,0
1,115,70,30,96,34.6,0.529,32,1
3,126,88,41,235,39.3,0.704,27,0
8,99,84,0,0,35.4,0.388,50,0
7,196,90,0,0,39.8,0.451,41,1
9,119,80,35,0,29,0.263,29,1
11,143,94,33,146,36.6,0.254,51,1
10,125,70,26,115,31.1,0.205,41,1
7,147,76,0,0,39.4,0.257,43,1
1,97,66,15,140,23.2,0.487,22,0
13,145,82,19,110,22.2,0.245,57,0
5,117,92,0,0,34.1,0.337,38,0
5,109,75,26,0,36,0.546,60,0
3,158,76,36,245,31.6,0.851,28,1
3,88,58,11,54,24.8,0.267,22,0
6,92,92,0,0,19.9,0.188,28,0
10,122,78,31,0,27.6,0.512,45,0
4,103,60,33,192,24,0.966,33,0
11,138,76,0,0,33.2,0.42,35,0
9,102,76,37,0,32.9,0.665,46,1
2,90,68,42,0,38.2,0.503,27,1
4,111,72,47,207,37.1,1.39,56,1
3,180,64,25,70,34,0.271,26,0
7,133,84,0,0,40.2,0.696,37,0
7,106,92,18,0,22.7,0.235,48,0
9,171,110,24,240,45.4,0.721,54,1
7,159,64,0,0,27.4,0.294,40,0
0,180,66,39,0,42,1.893,25,1
1,146,56,0,0,29.7,0.564,29,0
2,71,70,27,0,28,0.586,22,0
7,103,66,32,0,39.1,0.344,31,1
7,105,0,0,0,0,0.305,24,0
1,103,80,11,82,19.4,0.491,22,0

1,101,50,15,36,24.2,0.526,26,0
5,88,66,21,23,24.4,0.342,30,0
8,176,90,34,300,33.7,0.467,58,1
7,150,66,42,342,34.7,0.718,42,0
1,73,50,10,0,23,0.248,21,0
7,187,68,39,304,37.7,0.254,41,1
0,100,88,60,110,46.8,0.962,31,0
0,146,82,0,0,40.5,1.781,44,0
0,105,64,41,142,41.5,0.173,22,0
2,84,0,0,0,0.304,21,0
8,133,72,0,0,32.9,0.27,39,1
5,44,62,0,0,25,0.587,36,0
2,141,58,34,128,25.4,0.699,24,0
7,114,66,0,0,32.8,0.258,42,1
5,99,74,27,0,29,0.203,32,0
0,109,88,30,0,32.5,0.855,38,1
2,109,92,0,0,42.7,0.845,54,0
1,95,66,13,38,19.6,0.334,25,0
4,146,85,27,100,28.9,0.189,27,0
2,100,66,20,90,32.9,0.867,28,1
5,139,64,35,140,28.6,0.411,26,0
13,126,90,0,0,43.4,0.583,42,1
4,129,86,20,270,35.1,0.231,23,0
1,79,75,30,0,32,0.396,22,0
1,0,48,20,0,24.7,0.14,22,0
7,62,78,0,0,32.6,0.391,41,0
5,95,72,33,0,37.7,0.37,27,0
0,131,0,0,0,43.2,0.27,26,1
2,112,66,22,0,25,0.307,24,0
3,113,44,13,0,22.4,0.14,22,0
2,74,0,0,0,0.102,22,0
7,83,78,26,71,29.3,0.767,36,0
0,101,65,28,0,24.6,0.237,22,0
5,137,108,0,0,48.8,0.227,37,1
2,110,74,29,125,32.4,0.698,27,0
13,106,72,54,0,36.6,0.178,45,0
2,100,68,25,71,38.5,0.324,26,0
15,136,70,32,110,37.1,0.153,43,1
1,107,68,19,0,26.5,0.165,24,0
1,80,55,0,0,19.1,0.258,21,0
4,123,80,15,176,32,0.443,34,0
7,81,78,40,48,46.7,0.261,42,0

4,134,72,0,0,23.8,0.277,60,1
2,142,82,18,64,24.7,0.761,21,0
6,144,72,27,228,33.9,0.255,40,0
2,92,62,28,0,31.6,0.13,24,0
1,71,48,18,76,20.4,0.323,22,0
6,93,50,30,64,28.7,0.356,23,0
1,122,90,51,220,49.7,0.325,31,1
1,163,72,0,0,39,1.222,33,1
1,151,60,0,0,26.1,0.179,22,0
0,125,96,0,0,22.5,0.262,21,0
1,81,72,18,40,26.6,0.283,24,0
2,85,65,0,0,39.6,0.93,27,0
1,126,56,29,152,28.7,0.801,21,0
1,96,122,0,0,22.4,0.207,27,0
4,144,58,28,140,29.5,0.287,37,0
3,83,58,31,18,34.3,0.336,25,0
0,95,85,25,36,37.4,0.247,24,1
3,171,72,33,135,33.3,0.199,24,1
8,155,62,26,495,34,0.543,46,1
1,89,76,34,37,31.2,0.192,23,0
4,76,62,0,0,34,0.391,25,0
7,160,54,32,175,30.5,0.588,39,1
4,146,92,0,0,31.2,0.539,61,1
5,124,74,0,0,34,0.22,38,1
5,78,48,0,0,33.7,0.654,25,0
4,97,60,23,0,28.2,0.443,22,0
4,99,76,15,51,23.2,0.223,21,0
0,162,76,56,100,53.2,0.759,25,1
6,111,64,39,0,34.2,0.26,24,0
2,107,74,30,100,33.6,0.404,23,0
5,132,80,0,0,26.8,0.186,69,0
0,113,76,0,0,33.3,0.278,23,1
1,88,30,42,99,55,0.496,26,1
3,120,70,30,135,42.9,0.452,30,0
1,118,58,36,94,33.3,0.261,23,0
1,117,88,24,145,34.5,0.403,40,1
0,105,84,0,0,27.9,0.741,62,1
4,173,70,14,168,29.7,0.361,33,1
9,122,56,0,0,33.3,1.114,33,1
3,170,64,37,225,34.5,0.356,30,1
8,84,74,31,0,38.3,0.457,39,0
2,96,68,13,49,21.1,0.647,26,0

2,125,60,20,140,33.8,0.088,31,0
0,100,70,26,50,30.8,0.597,21,0
0,93,60,25,92,28.7,0.532,22,0
0,129,80,0,0,31.2,0.703,29,0
5,105,72,29,325,36.9,0.159,28,0
3,128,78,0,0,21.1,0.268,55,0
5,106,82,30,0,39.5,0.286,38,0
2,108,52,26,63,32.5,0.318,22,0
10,108,66,0,0,32.4,0.272,42,1
4,154,62,31,284,32.8,0.237,23,0
0,102,75,23,0,0,0.572,21,0
9,57,80,37,0,32.8,0.096,41,0
2,106,64,35,119,30.5,1.4,34,0
5,147,78,0,0,33.7,0.218,65,0
2,90,70,17,0,27.3,0.085,22,0
1,136,74,50,204,37.4,0.399,24,0
4,114,65,0,0,21.9,0.432,37,0
9,156,86,28,155,34.3,1.189,42,1
1,153,82,42,485,40.6,0.687,23,0
8,188,78,0,0,47.9,0.137,43,1
7,152,88,44,0,50,0.337,36,1
2,99,52,15,94,24.6,0.637,21,0
1,109,56,21,135,25.2,0.833,23,0
2,88,74,19,53,29,0.229,22,0
17,163,72,41,114,40.9,0.817,47,1
4,151,90,38,0,29.7,0.294,36,0
7,102,74,40,105,37.2,0.204,45,0
0,114,80,34,285,44.2,0.167,27,0
2,100,64,23,0,29.7,0.368,21,0
0,131,88,0,0,31.6,0.743,32,1
6,104,74,18,156,29.9,0.722,41,1
3,148,66,25,0,32.5,0.256,22,0
4,120,68,0,0,29.6,0.709,34,0
4,110,66,0,0,31.9,0.471,29,0
3,111,90,12,78,28.4,0.495,29,0
6,102,82,0,0,30.8,0.18,36,1
6,134,70,23,130,35.4,0.542,29,1
2,87,0,23,0,28.9,0.773,25,0
1,79,60,42,48,43.5,0.678,23,0
2,75,64,24,55,29.7,0.37,33,0
8,179,72,42,130,32.7,0.719,36,1
6,85,78,0,0,31.2,0.382,42,0

0,129,110,46,130,67.1,0.319,26,1
5,143,78,0,0,45,0.19,47,0
5,130,82,0,0,39.1,0.956,37,1
6,87,80,0,0,23.2,0.084,32,0
0,119,64,18,92,34.9,0.725,23,0
1,0,74,20,23,27.7,0.299,21,0
5,73,60,0,0,26.8,0.268,27,0
4,141,74,0,0,27.6,0.244,40,0
7,194,68,28,0,35.9,0.745,41,1
8,181,68,36,495,30.1,0.615,60,1
1,128,98,41,58,32,1.321,33,1
8,109,76,39,114,27.9,0.64,31,1
5,139,80,35,160,31.6,0.361,25,1
3,111,62,0,0,22.6,0.142,21,0
9,123,70,44,94,33.1,0.374,40,0
7,159,66,0,0,30.4,0.383,36,1
11,135,0,0,0,52.3,0.578,40,1
8,85,55,20,0,24.4,0.136,42,0
5,158,84,41,210,39.4,0.395,29,1
1,105,58,0,0,24.3,0.187,21,0
3,107,62,13,48,22.9,0.678,23,1
4,109,64,44,99,34.8,0.905,26,1
4,148,60,27,318,30.9,0.15,29,1
0,113,80,16,0,31,0.874,21,0
1,138,82,0,0,40.1,0.236,28,0
0,108,68,20,0,27.3,0.787,32,0
2,99,70,16,44,20.4,0.235,27,0
6,103,72,32,190,37.7,0.324,55,0
5,111,72,28,0,23.9,0.407,27,0
8,196,76,29,280,37.5,0.605,57,1
5,162,104,0,0,37.7,0.151,52,1
1,96,64,27,87,33.2,0.289,21,0
7,184,84,33,0,35.5,0.355,41,1
2,81,60,22,0,27.7,0.29,25,0
0,147,85,54,0,42.8,0.375,24,0
7,179,95,31,0,34.2,0.164,60,0
0,140,65,26,130,42.6,0.431,24,1
9,112,82,32,175,34.2,0.26,36,1
12,151,70,40,271,41.8,0.742,38,1
5,109,62,41,129,35.8,0.514,25,1
6,125,68,30,120,30,0.464,32,0
5,85,74,22,0,29,1.224,32,1

5,112,66,0,0,37.8,0.261,41,1
0,177,60,29,478,34.6,1.072,21,1
2,158,90,0,0,31.6,0.805,66,1
7,119,0,0,0,25.2,0.209,37,0
7,142,60,33,190,28.8,0.687,61,0
1,100,66,15,56,23.6,0.666,26,0
1,87,78,27,32,34.6,0.101,22,0
0,101,76,0,0,35.7,0.198,26,0
3,162,52,38,0,37.2,0.652,24,1
4,197,70,39,744,36.7,2.329,31,0
0,117,80,31,53,45.2,0.089,24,0
4,142,86,0,0,44,0.645,22,1
6,134,80,37,370,46.2,0.238,46,1
1,79,80,25,37,25.4,0.583,22,0
4,122,68,0,0,35,0.394,29,0
3,74,68,28,45,29.7,0.293,23,0
4,171,72,0,0,43.6,0.479,26,1
7,181,84,21,192,35.9,0.586,51,1
0,179,90,27,0,44.1,0.686,23,1
9,164,84,21,0,30.8,0.831,32,1
0,104,76,0,0,18.4,0.582,27,0
1,91,64,24,0,29.2,0.192,21,0
4,91,70,32,88,33.1,0.446,22,0
3,139,54,0,0,25.6,0.402,22,1
6,119,50,22,176,27.1,1.318,33,1
2,146,76,35,194,38.2,0.329,29,0
9,184,85,15,0,30,1.213,49,1
10,122,68,0,0,31.2,0.258,41,0
0,165,90,33,680,52.3,0.427,23,0
9,124,70,33,402,35.4,0.282,34,0
1,111,86,19,0,30.1,0.143,23,0
9,106,52,0,0,31.2,0.38,42,0
2,129,84,0,0,28,0.284,27,0
2,90,80,14,55,24.4,0.249,24,0
0,86,68,32,0,35.8,0.238,25,0
12,92,62,7,258,27.6,0.926,44,1
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3,111,56,39,0,30.1,0.557,30,0
2,114,68,22,0,28.7,0.092,25,0
1,193,50,16,375,25.9,0.655,24,0
11,155,76,28,150,33.3,1.353,51,1
3,191,68,15,130,30.9,0.299,34,0

3,141,0,0,0,30,0.761,27,1
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3,142,80,15,0,32.4,0.2,63,0
4,123,62,0,0,32,0.226,35,1
5,96,74,18,67,33.6,0.997,43,0
0,138,0,0,0,36.3,0.933,25,1
2,128,64,42,0,40,1.101,24,0
0,102,52,0,0,25.1,0.078,21,0
2,146,0,0,0,27.5,0.24,28,1
10,101,86,37,0,45.6,1.136,38,1
2,108,62,32,56,25.2,0.128,21,0
3,122,78,0,0,23,0.254,40,0
1,71,78,50,45,33.2,0.422,21,0
13,106,70,0,0,34.2,0.251,52,0
2,100,70,52,57,40.5,0.677,25,0
7,106,60,24,0,26.5,0.296,29,1
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10,129,76,28,122,35.9,0.28,39,0
7,133,88,15,155,32.4,0.262,37,0
7,161,86,0,0,30.4,0.165,47,1
2,108,80,0,0,27,0.259,52,1
7,136,74,26,135,26.0,0.647,51,0
5,155,84,44,545,38.7,0.619,34,0
1,119,86,39,220,45.6,0.808,29,1
4,96,56,17,49,20.8,0.34,26,0
5,108,72,43,75,36.1,0.263,33,0
0,78,88,29,40,36.9,0.434,21,0
0,107,62,30,74,36.6,0.757,25,1
2,128,78,37,182,43.3,1.224,31,1
1,128,48,45,194,40.5,0.613,24,1
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6,151,62,31,120,35.5,0.692,28,0
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14,100,78,25,184,36.6,0.412,46,1
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2,155,74,17,96,26.6,0.433,27,1
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3,99,80,11,64,19.3,0.284,30,0
3,182,74,0,0,30.5,0.345,29,1
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6,194,78,0,0,23.5,0.129,59,1
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13,152,90,33,29,26.8,0.731,43,1
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8,118,72,19,0,23.1,1.476,46,0
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12,106,80,0,0,23.6,0.137,44,0
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0,165,76,43,255,47.9,0.259,26,0
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9,152,78,34,171,34.2,0.893,33,1
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1,130,70,13,105,25.9,0.472,22,0
1,95,74,21,73,25.9,0.673,36,0
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5,122,86,0,0,34.7,0.29,33,0
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8,126,88,36,108,38.5,0.349,49,0
1,139,46,19,83,28.7,0.654,22,0
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5,0,80,32,0,41,0.346,37,1
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4,137,84,0,0,31.2,0.252,30,0
3,61,82,28,0,34.4,0.243,46,0
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3,90,78,0,0,42.7,0.559,21,0
9,165,88,0,0,30.4,0.302,49,1
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5,103,108,37,0,39.2,0.305,65,0
4,146,78,0,0,38.5,0.52,67,1
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6,124,72,0,0,27.6,0.368,29,1
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3,81,86,16,66,27.5,0.306,22,0
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0,84,64,22,66,35.8,0.545,21,0
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1,87,60,37,75,37.2,0.509,22,0
4,156,75,0,0,48.3,0.238,32,1
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1,90,62,18,59,25.1,1.268,25,0
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4,158,78,0,0,32.9,0.803,31,1
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14,175,62,30,0,33.6,0.212,38,1
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9,120,72,22,56,20.8,0.733,48,0
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0,145,0,0,0,44.2,0.63,31,1
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0,57,60,0,0,21.7,0.735,67,0
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3,129,92,49,155,36.4,0.968,32,1
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2,95,54,14,88,26.1,0.748,22,0
1,99,72,30,18,38.6,0.412,21,0
6,92,62,32,126,32,0.085,46,0
4,154,72,29,126,31.3,0.338,37,0
0,121,66,30,165,34.3,0.203,33,1
3,78,70,0,0,32.5,0.27,39,0
2,130,96,0,0,22.6,0.268,21,0
3,111,58,31,44,29.5,0.43,22,0
2,98,60,17,120,34.7,0.198,22,0
1,143,86,30,330,30.1,0.892,23,0
1,119,44,47,63,35.5,0.28,25,0
6,108,44,20,130,24,0.813,35,0
2,118,80,0,0,42.9,0.693,21,1
10,133,68,0,0,27,0.245,36,0
2,197,70,99,0,34.7,0.575,62,1
0,151,90,46,0,42.1,0.371,21,1
6,109,60,27,0,25,0.206,27,0
12,121,78,17,0,26.5,0.259,62,0
8,100,76,0,0,38.7,0.19,42,0
8,124,76,24,600,28.7,0.687,52,1
1,93,56,11,0,22.5,0.417,22,0
8,143,66,0,0,34.9,0.129,41,1
6,103,66,0,0,24.3,0.249,29,0
3,176,86,27,156,33.3,1.154,52,1
0,73,0,0,0,21.1,0.342,25,0
11,111,84,40,0,46.8,0.925,45,1
2,112,78,50,140,39.4,0.175,24,0
3,132,80,0,0,34.4,0.402,44,1
2,82,52,22,115,28.5,1.699,25,0
6,123,72,45,230,33.6,0.733,34,0
0,188,82,14,185,32,0.682,22,1
0,67,76,0,0,45.3,0.194,46,0

1,89,24,19,25,27.8,0.559,21,0
1,173,74,0,0,36.8,0.088,38,1
1,109,38,18,120,23.1,0.407,26,0
1,108,88,19,0,27.1,0.4,24,0
6,96,0,0,0,23.7,0.19,28,0
1,124,74,36,0,27.8,0.1,30,0
7,150,78,29,126,35.2,0.692,54,1
4,183,0,0,0,28.4,0.212,36,1
1,124,60,32,0,35.8,0.514,21,0
1,181,78,42,293,40,1.258,22,1
1,92,62,25,41,19.5,0.482,25,0
0,152,82,39,272,41.5,0.27,27,0
1,111,62,13,182,24,0.138,23,0
3,106,54,21,158,30.9,0.292,24,0
3,174,58,22,194,32.9,0.593,36,1
7,168,88,42,321,38.2,0.787,40,1
6,105,80,28,0,32.5,0.878,26,0
11,138,74,26,144,36.1,0.557,50,1
3,106,72,0,0,25.8,0.207,27,0
6,117,96,0,0,28.7,0.157,30,0
2,68,62,13,15,20.1,0.257,23,0
9,112,82,24,0,28.2,1.282,50,1
0,119,0,0,0,32.4,0.141,24,1
2,112,86,42,160,38.4,0.246,28,0
2,92,76,20,0,24.2,1.698,28,0
6,183,94,0,0,40.8,1.461,45,0
0,94,70,27,115,43.5,0.347,21,0
2,108,64,0,0,30.8,0.158,21,0
4,90,88,47,54,37.7,0.362,29,0
0,125,68,0,0,24.7,0.206,21,0
0,132,78,0,0,32.4,0.393,21,0
5,128,80,0,0,34.6,0.144,45,0
4,94,65,22,0,24.7,0.148,21,0
7,114,64,0,0,27.4,0.732,34,1
0,102,78,40,90,34.5,0.238,24,0
2,111,60,0,0,26.2,0.343,23,0
1,128,82,17,183,27.5,0.115,22,0
10,92,62,0,0,25.9,0.167,31,0
13,104,72,0,0,31.2,0.465,38,1
5,104,74,0,0,28.8,0.153,48,0
2,94,76,18,66,31.6,0.649,23,0
7,97,76,32,91,40.9,0.871,32,1

1,100,74,12,46,19.5,0.149,28,0
0,102,86,17,105,29.3,0.695,27,0
4,128,70,0,0,34.3,0.303,24,0
6,147,80,0,0,29.5,0.178,50,1
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3,103,72,30,152,27.6,0.73,27,0
2,157,74,35,440,39.4,0.134,30,0
1,167,74,17,144,23.4,0.447,33,1
0,179,50,36,159,37.8,0.455,22,1
11,136,84,35,130,28.3,0.26,42,1
0,107,60,25,0,26.4,0.133,23,0
1,91,54,25,100,25.2,0.234,23,0
1,117,60,23,106,33.8,0.466,27,0
5,123,74,40,77,34.1,0.269,28,0
2,120,54,0,0,26.8,0.455,27,0
1,106,70,28,135,34.2,0.142,22,0
2,155,52,27,540,38.7,0.24,25,1
2,101,58,35,90,21.8,0.155,22,0
1,120,80,48,200,38.9,1.162,41,0
11,127,106,0,0,39,0.19,51,0
3,80,82,31,70,34.2,1.292,27,1
10,162,84,0,0,27.7,0.182,54,0
1,199,76,43,0,42.9,1.394,22,1
8,167,106,46,231,37.6,0.165,43,1
9,145,80,46,130,37.9,0.637,40,1
6,115,60,39,0,33.7,0.245,40,1
1,112,80,45,132,34.8,0.217,24,0
4,145,82,18,0,32.5,0.235,70,1
10,111,70,27,0,27.5,0.141,40,1
6,98,58,33,190,34,0.43,43,0
9,154,78,30,100,30.9,0.164,45,0
6,165,68,26,168,33.6,0.631,49,0
1,99,58,10,0,25.4,0.551,21,0
10,68,106,23,49,35.5,0.285,47,0
3,123,100,35,240,57.3,0.88,22,0
8,91,82,0,0,35.6,0.587,68,0
6,195,70,0,0,30.9,0.328,31,1
9,156,86,0,0,24.8,0.23,53,1
0,93,60,0,0,35.3,0.263,25,0
3,121,52,0,0,36,0.127,25,1
2,101,58,17,265,24.2,0.614,23,0
2,56,56,28,45,24.2,0.332,22,0

0,162,76,36,0,49.6,0.364,26,1
0,95,64,39,105,44.6,0.366,22,0
4,125,80,0,0,32.3,0.536,27,1
5,136,82,0,0,0,0.64,69,0
2,129,74,26,205,33.2,0.591,25,0
3,130,64,0,0,23.1,0.314,22,0
1,107,50,19,0,28.3,0.181,29,0
1,140,74,26,180,24.1,0.828,23,0
1,144,82,46,180,46.1,0.335,46,1
8,107,80,0,0,24.6,0.856,34,0
13,158,114,0,0,42.3,0.257,44,1
2,121,70,32,95,39.1,0.886,23,0
7,129,68,49,125,38.5,0.439,43,1
2,90,60,0,0,23.5,0.191,25,0
7,142,90,24,480,30.4,0.128,43,1
3,169,74,19,125,29.9,0.268,31,1
0,99,0,0,0,25,0.253,22,0
4,127,88,11,155,34.5,0.598,28,0
4,118,70,0,0,44.5,0.904,26,0
2,122,76,27,200,35.9,0.483,26,0
6,125,78,31,0,27.6,0.565,49,1
1,168,88,29,0,35,0.905,52,1
2,129,0,0,0,38.5,0.304,41,0
4,110,76,20,100,28.4,0.118,27,0
6,80,80,36,0,39.8,0.177,28,0
10,115,0,0,0,0,0.261,30,1
2,127,46,21,335,34.4,0.176,22,0
9,164,78,0,0,32.8,0.148,45,1
2,93,64,32,160,38,0.674,23,1
3,158,64,13,387,31.2,0.295,24,0
5,126,78,27,22,29.6,0.439,40,0
10,129,62,36,0,41.2,0.441,38,1
0,134,58,20,291,26.4,0.352,21,0
3,102,74,0,0,29.5,0.121,32,0
7,187,50,33,392,33.9,0.826,34,1
3,173,78,39,185,33.8,0.97,31,1
10,94,72,18,0,23.1,0.595,56,0
1,108,60,46,178,35.5,0.415,24,0
5,97,76,27,0,35.6,0.378,52,1
4,83,86,19,0,29.3,0.317,34,0
1,114,66,36,200,38.1,0.289,21,0
1,149,68,29,127,29.3,0.349,42,1

5,117,86,30,105,39.1,0.251,42,0
1,111,94,0,0,32.8,0.265,45,0
4,112,78,40,0,39.4,0.236,38,0
1,116,78,29,180,36.1,0.496,25,0
0,141,84,26,0,32.4,0.433,22,0
2,175,88,0,0,22.9,0.326,22,0
2,92,52,0,0,30.1,0.141,22,0
3,130,78,23,79,28.4,0.323,34,1
8,120,86,0,0,28.4,0.259,22,1
2,174,88,37,120,44.5,0.646,24,1
2,106,56,27,165,29,0.426,22,0
2,105,75,0,0,23.3,0.56,53,0
4,95,60,32,0,35.4,0.284,28,0
0,126,86,27,120,27.4,0.515,21,0
8,65,72,23,0,32,0.6,42,0
2,99,60,17,160,36.6,0.453,21,0
1,102,74,0,0,39.5,0.293,42,1
11,120,80,37,150,42.3,0.785,48,1
3,102,44,20,94,30.8,0.4,26,0
1,109,58,18,116,28.5,0.219,22,0
9,140,94,0,0,32.7,0.734,45,1
13,153,88,37,140,40.6,1.174,39,0
12,100,84,33,105,30,0.488,46,0
1,147,94,41,0,49.3,0.358,27,1
1,81,74,41,57,46.3,1.096,32,0
3,187,70,22,200,36.4,0.408,36,1
6,162,62,0,0,24.3,0.178,50,1
4,136,70,0,0,31.2,1.182,22,1
1,121,78,39,74,39,0.261,28,0
3,108,62,24,0,26,0.223,25,0
0,181,88,44,510,43.3,0.222,26,1
8,154,78,32,0,32.4,0.443,45,1
1,128,88,39,110,36.5,1.057,37,1
7,137,90,41,0,32,0.391,39,0
0,123,72,0,0,36.3,0.258,52,1
1,106,76,0,0,37.5,0.197,26,0
6,190,92,0,0,35.5,0.278,66,1
2,88,58,26,16,28.4,0.766,22,0
9,170,74,31,0,44,0.403,43,1
9,89,62,0,0,22.5,0.142,33,0
10,101,76,48,180,32.9,0.171,63,0
2,122,70,27,0,36.8,0.34,27,0

5,121,72,23,112,26.2,0.245,30,0
1,126,60,0,0,30.1,0.349,47,1
1,93,70,31,0,30.4,0.315,23,0

Status : Correct

Marks : 10/10

3. Problem Statement

A physics teacher named Mr. Rao is designing a smart system to classify different balance beam setups used in his lab. He receives CSV datasets where each row represents a setup defined by the weight and distance of objects placed on both ends of the beam.

Write a program to build a decision tree classifier using the ID3 algorithm (which splits based on entropy) to determine the balance class of each configuration, and display the tree structure in a readable text format.

Answer

main.py

```
from sklearn.tree import DecisionTreeClassifier
from sklearn import tree
import pandas as pd
import os
import sys
```

```
# Load dataset
```

```
file_name = input().strip()
file_path = os.path.join(sys.path[0], file_name)
data = pd.read_csv(file_path)
```

```
# Separate features and target
```

```
X = data.iloc[:, 1:]
y = data.iloc[:, 0]
```

```
# Fix randomness
```

```
classifier = DecisionTreeClassifier(criterion='entropy', random_state=42)
classifier.fit(X, y)
```

```
# Display the trained tree
```

```
print("Decision Tree (Text Format):")
tree_text = tree.export_text(classifier, feature_names=list(X.columns))
print(tree_text)
```

sample1.csv

```
class,left_weight,left_distance,right_weight,right_distance
1,1,1,1,1
2,1,1,1,2
2,1,1,1,3
2,1,1,1,4
2,1,1,1,5
2,1,1,2,1
2,1,1,2,2
2,1,1,2,3
2,1,1,2,4
2,1,1,2,5
2,1,1,3,1
2,1,1,3,2
2,1,1,3,3
2,1,1,3,4
2,1,1,3,5
2,1,1,4,1
2,1,1,4,2
2,1,1,4,3
2,1,1,4,4
2,1,1,4,5
2,1,1,5,1
2,1,1,5,2
2,1,1,5,3
2,1,1,5,4
```

sample2.csv

```
class,left_weight,left_distance,right_weight,right_distance
1,1,1,1,1
2,1,1,1,2
2,1,1,1,3
2,1,1,1,4
2,1,1,1,5
2,1,1,2,1
2,1,1,2,2
2,1,1,2,3
2,1,1,2,4
```

2,1,1,2,5

2,1,1,3,1

2,1,1,3,2

2,1,1,3,3

2,1,1,3,4

2,1,1,3,5

2,1,1,4,1

2,1,1,4,2

2,1,1,4,3

2,1,1,4,4

2,1,1,4,5

2,1,1,5,1

2,1,1,5,2

2,1,1,5,3

2,1,1,5,4

2,1,1,5,5

0,1,2,1,1

1,1,2,1,2

2,1,2,1,3

2,1,2,1,4

2,1,2,1,5

1,1,2,2,1

2,1,2,2,2

2,1,2,2,3

2,1,2,2,4

2,1,2,2,5

2,1,2,3,1

2,1,2,3,2

2,1,2,3,3

2,1,2,3,4

2,1,2,3,5

2,1,2,4,1

2,1,2,4,2

2,1,2,4,3

easy1.csv

class,left_weight,left_distance,right_weight,right_distance

1,1,1,1,1

2,1,1,1,2

2,1,1,1,3

2,1,1,1,4

2,1,1,1,5

2,1,1,2,1
2,1,1,2,2
2,1,1,2,3
2,1,1,2,4
2,1,1,2,5
2,1,1,3,1
2,1,1,3,2
2,1,1,3,3
2,1,1,3,4
2,1,1,3,5
2,1,1,4,1
2,1,1,4,2
2,1,1,4,3
2,1,1,4,4
2,1,1,4,5
2,1,1,5,1
2,1,1,5,2
2,1,1,5,3
2,1,1,5,4
2,1,1,5,5
0,1,2,1,1
1,1,2,1,2
2,1,2,1,3
2,1,2,1,4
2,1,2,1,5
1,1,2,2,1
2,1,2,2,2
2,1,2,2,3
2,1,2,2,4
2,1,2,2,5
2,1,2,3,1
2,1,2,3,2
2,1,2,3,3
2,1,2,3,4
2,1,2,3,5
2,1,2,4,1
2,1,2,4,2
2,1,2,4,3
2,1,2,4,4
2,1,2,4,5
2,1,2,5,1
2,1,2,5,2

2,1,2,5,3
2,1,2,5,4
2,1,2,5,5
0,1,3,1,1
0,1,3,1,2
1,1,3,1,3
2,1,3,1,4
2,1,3,1,5
0,1,3,2,1
2,1,3,2,2
2,1,3,2,3
2,1,3,2,4
2,1,3,2,5
1,1,3,3,1
2,1,3,3,2
2,1,3,3,3
2,1,3,3,4
2,1,3,3,5

easy2.csv

class,left_weight,left_distance,right_weight,right_distance

1,1,1,1,1
2,1,1,1,2
2,1,1,1,3
2,1,1,1,4
2,1,1,1,5
2,1,1,2,1
2,1,1,2,2
2,1,1,2,3
2,1,1,2,4
2,1,1,2,5
2,1,1,3,1
2,1,1,3,2
2,1,1,3,3
2,1,1,3,4
2,1,1,3,5
2,1,1,4,1
2,1,1,4,2
2,1,1,4,3
2,1,1,4,4
2,1,1,4,5
2,1,1,5,1

2,1,1,5,2

2,1,1,5,3

2,1,1,5,4

2,1,1,5,5

0,1,2,1,1

1,1,2,1,2

2,1,2,1,3

2,1,2,1,4

2,1,2,1,5

1,1,2,2,1

2,1,2,2,2

2,1,2,2,3

2,1,2,2,4

2,1,2,2,5

2,1,2,3,1

2,1,2,3,2

2,1,2,3,3

2,1,2,3,4

2,1,2,3,5

2,1,2,4,1

2,1,2,4,2

2,1,2,4,3

2,1,2,4,4

2,1,2,4,5

2,1,2,5,1

2,1,2,5,2

2,1,2,5,3

2,1,2,5,4

2,1,2,5,5

0,1,3,1,1

0,1,3,1,2

1,1,3,1,3

2,1,3,1,4

2,1,3,1,5

0,1,3,2,1

2,1,3,2,2

2,1,3,2,3

2,1,3,2,4

2,1,3,2,5

1,1,3,3,1

2,1,3,3,2

2,1,3,3,3

2,1,3,3,4
2,1,3,3,5
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2,1,3,4,2
2,1,3,4,3
2,1,3,4,4
2,1,3,4,5
2,1,3,5,1
2,1,3,5,2
2,1,3,5,3
2,1,3,5,4
2,1,3,5,5
0,1,4,1,1
0,1,4,1,2
0,1,4,1,3
1,1,4,1,4
2,1,4,1,5
0,1,4,2,1
1,1,4,2,2
2,1,4,2,3
2,1,4,2,4
2,1,4,2,5
0,1,4,3,1
2,1,4,3,2

medium1.csv

class,left_weight,left_distance,right_weight,right_distance

1,1,1,1,1
2,1,1,1,2
2,1,1,1,3
2,1,1,1,4
2,1,1,1,5
2,1,1,2,1
2,1,1,2,2
2,1,1,2,3
2,1,1,2,4
2,1,1,2,5
2,1,1,3,1
2,1,1,3,2
2,1,1,3,3
2,1,1,3,4
2,1,1,3,5

2,1,1,4,1

2,1,1,4,2

2,1,1,4,3

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2,1,1,4,5

2,1,1,5,1

2,1,1,5,2

2,1,1,5,3

2,1,1,5,4

2,1,1,5,5

0,1,2,1,1

1,1,2,1,2

2,1,2,1,3

2,1,2,1,4

2,1,2,1,5

1,1,2,2,1

2,1,2,2,2

2,1,2,2,3

2,1,2,2,4

2,1,2,2,5

2,1,2,3,1

2,1,2,3,2

2,1,2,3,3

2,1,2,3,4

2,1,2,3,5

2,1,2,4,1

2,1,2,4,2

2,1,2,4,3

2,1,2,4,4

2,1,2,4,5

2,1,2,5,1

2,1,2,5,2

2,1,2,5,3

2,1,2,5,4

2,1,2,5,5

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0,1,3,1,2

1,1,3,1,3

2,1,3,1,4

2,1,3,1,5

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medium2.csv

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hard1.csv

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hard2.csv

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Status : Correct

Marks : 10/10