% 1. Title: Pima Indians Diabetes Database

%

% 2. Sources:

% (a) Original owners: National Institute of Diabetes and Digestive and

% Kidney Diseases

% (b) Donor of database: Vincent Sigillito (vgs@aplcen.apl.jhu.edu)

% Research Center, RMI Group Leader

% Applied Physics Laboratory

% The Johns Hopkins University

% Johns Hopkins Road

% Laurel, MD 20707

% (301) 953-6231

% (c) Date received: 9 May 1990

%

% 3. Past Usage:

% 1. Smith,~J.~W., Everhart,~J.~E., Dickson,~W.~C., Knowler,~W.~C., \&

% Johannes,~R.~S. (1988). Using the ADAP learning algorithm to forecast

% the onset of diabetes mellitus. In {\it Proceedings of the Symposium

% on Computer Applications and Medical Care} (pp. 261--265). IEEE

% Computer Society Press.

%

% The diagnostic, binary-valued variable investigated is whether the

% patient shows signs of diabetes according to World Health Organization

% criteria (i.e., if the 2 hour post-load plasma glucose was at least

% 200 mg/dl at any survey examination or if found during routine medical

% care). The population lives near Phoenix, Arizona, USA.

%

% 4. Relevant Information:

% Several constraints were placed on the selection of these instances from

% a larger database. In particular, all patients here are females at

% least 21 years old of Pima Indian heritage.

%

% 5. Number of Instances: 768

%

% 6. Number of Attributes: 8 plus class

%

% 7. For Each Attribute: (all numeric-valued)

% 1. Number of times pregnant

% 2. Plasma glucose concentration a 2 hours in an oral glucose

% tolerance test (allowed values 0-400)

% 3. Diastolic blood pressure (mm Hg allowed values 0-150)

% 4. Triceps skin fold thickness (mm allowed values 0-200)

% 5. 2-Hour serum insulin (mu U/ml allowed values 0-1000)

% 6. Body mass index (weight in kg/(height in m)^2) (allowed values 0-100)

% 7. Diabetes pedigree function (allowed values 0-5)

% 8. Age (years allowed values 0 - 120)

% 9. Class variable (0 or 1, allowed values tested\_positive or tested\_negative)

%

% 8. Missing Attribute Values: 4

%

% 9. Class Distribution: (class value 1 is interpreted as "tested\_positive for

% diabetes")

%

% Class Value Number of instances

% 0 500

% 1 26

%

% Relabeled values in attribute 'class'

% From: 0 To: tested\_negative

% From: 1 To: tested\_positive

%

@relation pima\_diabetes

@attribute 'preg' numeric

@attribute 'plas' numeric

@attribute 'pres' numeric

@attribute 'skin' numeric

@attribute 'insu' numeric

@attribute 'mass' numeric

@attribute 'pedi' numeric

@attribute 'age' numeric

@attribute 'class' { tested\_negative, tested\_positive}

@data

6,148,72,35,0,33.6,0.627,50,tested\_positive

1,85,66,29,0,26.6,0.351,31,tested\_negative

8,183,64,0,0,23.3,0.672,32,tested\_positive

1,89,66,23,94,28.1,0.167,21,tested\_negative

0,137,40,35,168,43.1,2.288,33,tested\_positive

5,116,74,0,0,25.6,0.201,30,tested\_negative

3,78,50,32,88,31,248,26,tested\_positive

10,115,0,0,0,35.3,0.134,29,testneg

2,197,70,45,543,30.5,0.158,53,tested\_positive

8,125,96,0,0,0,0.232,54,tested\_positive

4,110,92,0,0,37.6,0.191,30,tested\_negative

10,168,74,0,0,38,0.537,34,tested\_positive

10,139,80,0,0,27.1,1.441,57,tested\_negative

1,189,60,23,846,30.1,0.398,59,tested\_positive

5,166,72,19,175,25.8,0.587,51,tested\_positive

7,100,0,0,0,30,0.484,32,tested\_positive

0,118,84,47,230,45.8,0.551,31,tested\_positive

7,107,74,0,0,29.6,0.254,31,tested\_positive

1,103,30,38,83,43.3,0.183,33,tested\_negative

1,115,70,30,96,34.6,0.529,32,tested\_positive

3,126,88,41,235,39.3,0.704,27,tested\_negative

8,99,84,0,0,35.4,0.388,50,tested\_negative

7,196,90,0,0,39.8,0.451,41,tested\_positive

9,119,80,35,0,29,0.263,29,tested\_positive

11,143,94,33,146,36.6,0.254,51,tested\_positive

10,125,70,26,115,31.1,0.205,41,tested\_positive

7,147,76,0,0,39.4,0.257,43,tested\_positive

1,97,66,15,140,23.2,0.487,22,tested\_negative

13,145,82,19,110,22.2,0.245,57,tested\_negative

5,117,92,0,0,34.1,0.337,38,tested\_negative

5,109,75,26,0,36,0.546,60,tested\_negative

3,158,76,36,245,31.6,0.851,28,tested\_positive

3,88,58,11,54,24.8,0.267,22,tested\_negative

6,92,92,0,0,19.9,0.188,28,tested\_negative

10,122,78,31,0,27.6,0.512,45,tested\_negative

4,103,60,33,192,24,0.966,33,tested\_negative

11,138,76,0,0,33.2,0.42,35,tested\_negative

9,102,76,37,0,32.9,0.665,46,tested\_positive

2,90,68,42,0,38.2,0.503,27,tested\_positive

4,111,72,47,207,37.1,1.39,56,tested\_positive

3,180,64,25,70,34,0.271,26,tested\_negative

7,133,84,0,0,40.2,0.696,37,tested\_negative

7,106,92,18,0,22.7,0.235,48,tested\_negative

9,171,110,24,240,45.4,0.721,54,tested\_positive

7,159,64,0,0,27.4,0.294,40,tested\_negative

0,180,66,39,0,42,1.893,25,tested\_positive

1,146,56,0,0,29.7,0.564,29,tested\_negative

2,71,70,27,0,28,0.586,22,tested\_negative

7,103,66,32,0,39.1,0.344,31,tested\_positive

7,105,0,0,0,0,0.305,24,tested\_negative

1,103,80,11,82,19.4,0.491,22,tested\_negative

1,101,50,15,36,24.2,0.526,26,tested\_negative

5,88,66,21,23,24.4,0.342,30,tested\_negative

8,176,90,34,300,33.7,0.467,58,tested\_positive

7,150,66,42,342,34.7,0.718,42,tested\_negative

1,73,50,10,0,23,0.248,21,tested\_negative

7,187,68,39,304,37.7,0.254,41,tested\_positive

0,100,88,60,110,46.8,0.962,31,tested\_negative

0,146,82,0,0,40.5,1.781,44,tested\_negative

0,105,64,41,142,41.5,0.173,22,tested\_negative

2,84,0,0,0,0,0.304,21,tested\_negative

8,133,72,0,0,32.9,0.27,39,tested\_positive

5,44,62,0,0,25,0.587,36,tested\_negative

2,141,58,34,128,25.4,0.699,24,tested\_negative

7,114,66,0,0,32.8,0.258,42,tested\_positive

5,99,74,27,0,29,0.203,32,tested\_negative

0,109,88,30,0,32.5,0.855,38,tested\_positive

2,109,92,0,0,42.7,0.845,54,tested\_negative

1,95,66,13,38,19.6,0.334,25,tested\_negative

4,146,85,27,100,28.9,0.189,27,tested\_negative

2,100,66,20,90,32.9,0.867,28,tested\_positive

5,139,64,35,140,28.6,0.411,26,tested\_negative

13,126,90,0,0,43.4,0.583,42,tested\_positive

4,129,86,20,270,35.1,0.231,23,tested\_negative

1,79,75,30,0,32,0.396,22,tested\_negative

1,0,48,20,0,24.7,0.14,22,tested\_negative

7,62,78,,0,32.6,0.391,41,tested\_negative

5,95,72,33,0,37.7,0.37,27,tested\_negative

0,131,0,0,0,43.2,0.27,26,tested\_positive

2,112,66,22,0,25,0.307,24,tested\_negative

3,113,44,13,0,22.4,0.14,22,tested\_negative

2,74,0,0,0,0,0.102,22,tested\_negative

7,83,78,26,71,29.3,0.767,36,tested\_negative

0,101,65,28,0,24.6,0.237,22,tested\_negative

5,137,108,0,0,48.8,0.227,37,tested\_positive

2,110,74,29,125,32.4,0.698,27,tested\_negative

13,106,72,54,0,36.6,0.178,45,tested\_negative

2,100,68,25,71,38.5,0.324,26,tested\_negative

15,136,70,32,110,37.1,0.153,43,tested\_positive

1,107,68,19,0,26.5,0.165,24,tested\_negative

1,80,55,0,0,19.1,0.258,21,tested\_negative

4,123,80,15,176,32,0.443,34,tested\_negative

7,81,78,40,48,46.7,0.261,42,tested\_negative

4,134,72,0,0,23.8,0.277,60,tested\_positive

2,142,82,18,64,24.7,0.761,21,tested\_negative

6,144,72,27,228,33.9,0.255,40,tested\_negative

2,92,62,28,0,31.6,0.13,24,tested\_negative

1,71,48,18,76,20.4,0.323,22,tested\_negative

6,93,50,30,64,28.7,0.356,23,tested\_negative

1,122,90,51,220,49.7,0.325,31,tested\_positive

1,163,72,0,0,39,1.222,33,tested\_positive

1,151,60,0,0,26.1,0.179,22,tested\_negative

0,125,96,0,0,22.5,0.262,21,tested\_negative

1,81,72,18,40,26.6,0.283,24,tested\_negative

2,85,65,0,0,39.6,0.93,27,tested\_negative

1,126,56,29,152,28.7,0.801,21,tested\_negative

1,96,122,0,0,22.4,0.207,27,tested\_negative

4,144,58,28,140,29.5,0.287,37,tested\_negative

3,83,58,31,18,34.3,0.336,25,tested\_negative

0,95,85,25,36,37.4,0.247,24,tested\_positive

3,171,72,33,135,33.3,0.199,24,tested\_positive

8,155,62,26,495,34,0.543,46,tested\_positive

1,89,76,34,37,31.2,0.192,23,tested\_negative

4,76,62,0,0,34,0.391,25,tested\_negative

7,160,54,32,175,30.5,0.588,39,tested\_positive

4,146,92,0,0,31.2,0.539,61,tested\_positive

5,124,74,0,0,34,0.22,38,tested\_positive

5,78,48,0,0,33.7,0.654,25,tested\_negative

4,97,60,23,0,28.2,0.443,22,tested\_negative

4,99,76,15,51,23.2,0.223,21,tested\_negative

0,162,76,56,100,53.2,0.759,25,tested\_positive

6,111,64,39,0,34.2,0.26,24,tested\_negative

2,107,74,30,100,33.6,0.404,23,tested\_negative

5,132,80,0,0,26.8,0.186,69,tested\_negative

0,113,76,0,0,33.3,0.278,23,tested\_positive

1,88,30,42,99,55,0.496,26,tested\_positive

3,120,70,30,135,42.9,0.452,30,tested\_negative

1,118,58,36,94,33.3,0.261,23,tested\_negative

1,117,88,24,145,34.5,0.403,40,tested\_positive

0,105,84,0,0,27.9,0.741,62,tested\_positive

4,173,70,14,168,29.7,0.361,33,tested\_positive

9,122,56,0,0,33.3,1.114,33,tested\_positive

3,170,64,37,225,34.5,0.356,30,tested\_positive

8,84,74,31,0,38.3,0.457,39,tested\_negative

2,96,68,13,49,21.1,0.647,26,tested\_negative

2,125,60,20,140,33.8,0.088,31,tested\_negative

0,100,70,26,50,30.8,0.597,21,tested\_negative

0,93,60,25,92,28.7,0.532,22,tested\_negative

0,129,80,0,0,31.2,0.703,29,tested\_negative

5,105,72,29,325,36.9,0.159,28,tested\_negative

3,128,78,0,0,21.1,0.268,55,tested\_negative

5,106,82,30,0,39.5,0.286,38,tested\_negative

2,108,52,26,63,32.5,0.318,22,tested\_negative

10,108,66,0,0,32.4,0.272,42,tested\_positive

4,154,62,31,284,32.8,0.237,23,tested\_negative

0,102,75,23,0,0,0.572,21,tested\_negative

9,57,80,37,0,32.8,0.096,41,tested\_negative

2,106,64,35,119,30.5,,34,tested\_negative

5,147,78,0,0,33.7,0.218,65,tested\_negative

2,90,70,17,0,27.3,0.085,22,tested\_negative

1,136,74,50,204,37.4,0.399,24,tested\_negative

4,114,65,0,0,21.9,0.432,37,tested\_negative

9,156,86,28,155,34.3,1.189,42,tested\_positive

1,153,82,42,485,40.6,0.687,23,tested\_negative

8,188,78,0,0,47.9,0.137,43,tested\_positive

7,152,88,44,0,50,0.337,36,tested\_positive

2,99,52,15,94,24.6,0.637,21,tested\_negative

1,109,56,21,135,25.2,0.833,23,tested\_negative

2,88,74,19,53,29,0.229,22,tested\_negative

17,163,72,41,114,40.9,0.817,47,tested\_positive

4,151,90,38,0,29.7,0.294,36,tested\_negative

7,102,74,40,105,37.2,0.204,45,tested\_negative

0,114,80,34,285,44.2,0.167,27,tested\_negative

2,100,64,23,0,29.7,0.368,21,tested\_negative

0,131,88,0,0,31.6,0.743,32,tested\_positive

6,104,74,18,156,29.9,0.722,41,tested\_positive

3,148,66,25,0,32.5,0.256,22,tested\_negative

4,120,68,0,0,29.6,0.709,34,tested\_negative

4,110,66,0,0,31.9,0.471,29,tested\_negative

3,,90,12,78,28.4,0.495,29,tested\_negative

6,102,82,0,0,30.8,0.18,36,tested\_positive

6,134,70,23,130,35.4,0.542,29,tested\_positive

2,87,0,23,0,28.9,0.773,25,tested\_negative

1,79,60,42,48,43.5,0.678,23,tested\_negative

2,75,64,24,55,29.7,0.37,33,tested\_negative

8,179,72,42,130,32.7,0.719,36,tested\_positive

6,85,78,0,0,31.2,0.382,42,tested\_negative

0,129,110,46,130,67.1,0.319,26,tested\_positive

5,143,78,0,0,45,0.19,47,tested\_negative

5,130,82,0,0,39.1,0.956,37,tested\_positive

6,87,80,0,0,23.2,0.084,32,tested\_negative

0,119,64,18,92,34.9,0.725,23,tested\_negative

1,0,74,20,23,27.7,0.299,21,tested\_negative

5,73,60,0,0,26.8,0.268,27,tested\_negative

4,141,74,0,0,27.6,0.244,40,tested\_negative

7,194,68,28,0,35.9,0.745,41,tested\_positive

8,181,68,36,495,30.1,0.615,60,tested\_positive

1,128,98,41,58,32,1.321,33,tested\_positive

8,109,76,39,114,27.9,0.64,31,tested\_positive

5,139,80,35,160,31.6,0.361,25,tested\_positive

3,111,62,0,0,22.6,0.142,21,tested\_negative

9,123,70,44,94,33.1,0.374,40,tested\_negative

7,159,66,0,0,30.4,0.383,36,tested\_positive

11,135,0,0,0,52.3,0.578,40,tested\_positive

8,85,55,20,0,24.4,0.136,42,tested\_negative

5,158,84,41,210,39.4,0.395,29,tested\_positive

1,105,58,0,0,24.3,0.187,21,tested\_negative

3,107,62,13,48,22.9,0.678,23,tested\_positive

4,109,64,44,99,34.8,0.905,26,tested\_positive

4,148,60,27,318,30.9,0.15,29,tested\_positive

0,113,80,16,0,31,0.874,21,tested\_negative

1,138,82,0,0,40.1,0.236,28,tested\_negative

0,108,68,20,0,27.3,0.787,32,tested\_negative

2,99,70,16,44,20.4,0.235,27,tested\_negative

6,103,72,32,190,37.7,0.324,55,tested\_negative

5,111,72,28,0,23.9,0.407,27,tested\_negative

8,196,76,29,280,37.5,0.605,57,tested\_positive

5,162,104,0,0,37.7,0.151,52,tested\_positive

1,96,64,27,87,33.2,0.289,21,tested\_negative

7,184,84,33,0,35.5,0.355,41,tested\_positive

2,81,60,22,0,27.7,0.29,25,tested\_negative

0,147,85,54,0,42.8,0.375,24,tested\_negative

7,179,95,31,0,34.2,0.164,60,tested\_negative

0,140,65,26,130,42.6,0.431,24,tested\_positive

9,112,82,32,175,34.2,0.26,36,tested\_positive

12,151,70,40,271,41.8,0.742,38,tested\_positive

5,109,62,41,129,35.8,0.514,25,tested\_positive

6,125,68,30,120,30,0.464,32,tested\_negative

5,85,74,22,0,29,1.224,32,tested\_positive

5,112,66,0,0,37.8,0.261,41,tested\_positive

0,177,60,29,478,34.6,1.072,21,tested\_positive

2,158,90,0,0,31.6,0.805,66,tested\_positive

7,119,0,0,0,25.2,0.209,37,tested\_negative

7,142,60,33,190,28.8,0.687,61,tested\_negative

1,100,66,15,56,23.6,0.666,26,tested\_negative

1,87,78,27,32,34.6,0.101,22,tested\_negative

0,101,76,0,0,35.7,0.198,26,tested\_negative

3,162,52,38,0,37.2,0.652,24,tested\_positive

4,197,70,39,744,36.7,2.329,31,tested\_negative

0,117,80,31,53,45.2,0.089,24,tested\_negative

4,142,86,0,0,44,0.645,22,tested\_positive

6,134,80,37,370,46.2,0.238,46,tested\_positive

1,79,80,25,37,25.4,0.583,22,tested\_negative

4,122,68,0,0,35,0.394,29,tested\_negative

3,74,68,28,45,29.7,0.293,23,tested\_negative

4,171,72,0,0,43.6,0.479,26,tested\_positive

7,181,84,21,192,35.9,0.586,51,tested\_positive

0,179,90,27,0,44.1,0.686,23,tested\_positive

9,164,84,21,0,30.8,0.831,32,tested\_positive

0,104,76,0,0,18.4,0.582,27,tested\_negative

1,91,64,24,0,29.2,0.192,21,tested\_negative

4,91,70,32,88,33.1,0.446,22,tested\_negative

3,139,54,0,0,25.6,0.402,22,tested\_positive

6,119,50,22,176,27.1,1.318,33,tested\_positive

2,146,76,35,194,38.2,0.329,29,tested\_negative

9,184,85,15,0,30,1.213,49,tested\_positive

10,122,68,0,0,31.2,0.258,41,tested\_negative

0,165,90,33,680,52.3,0.427,23,tested\_negative

9,124,70,33,402,35.4,0.282,34,tested\_negative

1,111,86,19,0,30.1,0.143,23,tested\_negative

9,106,52,0,0,31.2,0.38,42,tested\_negative

2,129,84,0,0,28,0.284,27,tested\_negative

2,90,80,14,55,24.4,0.249,24,tested\_negative

0,86,68,32,0,35.8,0.238,25,tested\_negative

12,92,62,7,258,27.6,0.926,44,tested\_positive

1,113,64,35,0,33.6,0.543,21,tested\_positive

3,111,56,39,0,30.1,0.557,30,tested\_negative

2,114,68,22,0,28.7,0.092,25,tested\_negative

1,193,50,16,375,25.9,0.655,24,tested\_negative

11,155,76,28,150,33.3,1.353,51,tested\_positive

3,191,68,15,130,30.9,0.299,34,tested\_negative

3,141,0,0,0,30,0.761,27,tested\_positive

4,95,70,32,0,32.1,0.612,,tested\_negative

3,142,80,15,0,32.4,0.2,63,tested\_negative

4,123,62,0,0,32,0.226,35,tested\_positive

5,96,74,18,67,33.6,0.997,43,tested\_negative

0,138,0,0,0,36.3,0.933,25,tested\_positive

2,128,64,42,0,40,1.101,24,tested\_negative

0,102,52,0,0,25.1,0.078,21,tested\_negative

2,146,0,0,0,27.5,0.24,28,tested\_positive

10,101,86,37,0,45.6,1.136,38,tested\_positive

2,108,62,32,56,25.2,0.128,21,tested\_negative

3,122,78,0,0,23,0.254,40,tested\_negative

1,71,78,50,45,33.2,0.422,21,tested\_negative

13,106,70,0,0,34.2,0.251,52,tested\_negative

2,100,70,52,57,40.5,0.677,25,tested\_negative

7,106,60,24,0,26.5,0.296,29,tested\_positive

0,104,64,23,116,27.8,0.454,23,tested\_negative

5,114,74,0,0,24.9,0.744,57,tested\_negative

2,108,62,10,278,25.3,0.881,22,tested\_negative

0,146,70,0,0,37.9,0.334,28,tested\_positive

10,129,76,28,122,35.9,0.28,39,tested\_negative

7,133,88,15,155,32.4,0.262,37,tested\_negative

7,161,86,0,0,30.4,0.165,47,tested\_positive

2,108,80,0,0,27,0.259,52,tested\_positive

7,136,74,26,135,26,0.647,51,tested\_negative

5,155,84,44,545,38.7,0.619,34,tested\_negative

1,119,86,39,220,45.6,0.808,29,tested\_positive

4,96,56,17,49,20.8,0.34,26,tested\_negative

5,108,72,43,75,36.1,0.263,33,tested\_negative

0,78,88,29,40,36.9,0.434,21,tested\_negative

0,107,62,30,74,36.6,0.757,25,tested\_positive

2,128,78,37,182,43.3,1.224,31,tested\_positive

1,128,48,45,194,40.5,0.613,24,tested\_positive

0,161,50,0,0,21.9,0.254,65,tested\_negative

6,151,62,31,120,35.5,0.692,28,tested\_negative

2,146,70,38,360,28,0.337,29,tested\_positive

0,126,84,29,215,30.7,0.52,24,tested\_negative

14,100,78,25,184,36.6,0.412,46,tested\_positive

8,112,72,0,0,23.6,0.84,58,tested\_negative

0,167,0,0,0,32.3,0.839,30,tested\_positive

2,144,58,33,135,31.6,0.422,25,tested\_positive

5,77,82,41,42,35.8,0.156,35,tested\_negative

5,115,98,0,0,52.9,0.209,28,tested\_positive

3,150,76,0,0,21,0.207,37,tested\_negative

2,120,76,37,105,39.7,0.215,29,tested\_negative

10,161,68,23,132,25.5,0.326,47,tested\_positive

0,137,68,14,148,24.8,0.143,21,tested\_negative

0,128,68,19,180,30.5,1.391,25,tested\_positive

2,124,68,28,205,32.9,875,30,tested\_positive

6,80,66,30,0,26.2,0.313,41,tested\_negative

0,106,70,37,148,39.4,0.605,22,tested\_negative

2,155,74,17,96,26.6,0.433,27,tested\_positive

3,113,50,10,85,29.5,0.626,25,tested\_negative

7,109,80,31,0,35.9,1.127,43,tested\_positive

2,112,68,22,94,34.1,0.315,26,tested\_negative

3,99,80,11,64,19.3,0.284,30,tested\_negative

3,182,74,0,0,30.5,0.345,29,tested\_positive

3,115,66,39,140,38.1,0.15,28,tested\_negative

6,194,78,0,0,23.5,0.129,59,tested\_positive

4,129,60,12,231,27.5,0.527,31,tested\_negative

3,112,74,30,0,31.6,0.197,25,tested\_positive

0,124,70,20,0,27.4,0.254,36,tested\_positive

13,152,90,33,29,26.8,0.731,43,tested\_positive

2,112,75,32,0,35.7,0.148,21,tested\_negative

1,157,72,21,168,25.6,0.123,24,tested\_negative

1,122,64,32,156,35.1,0.692,30,tested\_positive

10,179,70,0,0,35.1,0.2,37,tested\_negative

2,102,86,36,120,45.5,0.127,23,tested\_positive

6,105,70,32,68,30.8,0.122,37,tested\_negative

8,118,72,19,0,23.1,1.476,46,tested\_negative

2,87,58,16,52,32.7,0.166,25,tested\_negative

1,180,0,0,0,43.3,0.282,41,tested\_positive

12,106,80,0,0,23.6,0.137,44,tested\_negative

1,95,60,18,58,23.9,0.26,22,tested\_negative

0,165,76,43,255,47.9,0.259,26,tested\_negative

0,117,0,0,0,33.8,0.932,44,tested\_negative

5,115,76,0,0,31.2,0.343,44,tested\_positive

9,152,78,34,171,34.2,0.893,33,tested\_positive

7,178,84,0,0,39.9,0.331,41,tested\_positive

1,130,70,13,105,25.9,0.472,22,tested\_negative

1,95,74,21,73,25.9,0.673,36,tested\_negative

1,0,68,35,0,32,0.389,22,tested\_negative

5,122,86,0,0,34.7,0.29,33,tested\_negative

8,95,72,0,0,36.8,0.485,57,tested\_negative

8,126,88,36,108,38.5,0.349,49,tested\_negative

1,139,46,19,83,28.7,0.654,22,tested\_negative

3,116,0,0,0,23.5,0.187,23,tested\_negative

3,99,62,19,74,21.8,0.279,26,tested\_negative

5,0,80,32,0,41,0.346,37,tested\_positive

4,92,80,0,0,42.2,0.237,29,tested\_negative

4,137,84,0,0,31.2,0.252,30,tested\_negative

3,61,82,28,0,34.4,0.243,46,tested\_negative

1,90,62,12,43,27.2,0.58,24,tested\_negative

3,90,78,0,0,42.7,0.559,21,tested\_negative

9,165,88,0,0,30.4,0.302,49,tested\_positive

1,125,50,40,167,33.3,0.962,28,tested\_positive

13,129,0,30,0,39.9,0.569,44,tested\_positive

12,88,74,40,54,35.3,0.378,48,tested\_negative

1,196,76,36,249,36.5,0.875,29,tested\_positive

5,189,64,33,325,31.2,0.583,29,tested\_positive

5,158,70,0,0,29.8,0.207,63,tested\_negative

5,103,108,37,0,39.2,0.305,65,tested\_negative

4,146,78,0,0,38.5,0.52,67,tested\_positive

4,147,74,25,293,34.9,0.385,30,tested\_negative

5,99,54,28,83,34,0.499,30,tested\_negative

6,124,72,0,0,27.6,0.368,29,tested\_positive

0,101,64,17,0,21,0.252,21,tested\_negative

3,81,86,16,66,27.5,0.306,22,tested\_negative

1,133,102,28,140,32.8,0.234,45,tested\_positive

3,173,82,48,465,38.4,2.137,25,tested\_positive

0,118,64,23,89,0,1.731,21,tested\_negative

0,84,64,22,66,35.8,0.545,21,tested\_negative

2,105,58,40,94,34.9,0.225,25,tested\_negative

2,122,52,43,158,36.2,0.816,28,tested\_negative

12,140,82,43,325,39.2,0.528,58,tested\_positive

0,98,82,15,84,25.2,0.299,22,tested\_negative

1,87,60,37,75,37.2,0.509,22,tested\_negative

4,156,75,0,0,48.3,0.238,32,tested\_positive

0,93,100,39,72,43.4,1.021,35,tested\_negative

1,107,72,30,82,30.8,0.821,24,tested\_negative

0,105,68,22,0,20,0.236,22,tested\_negative

1,109,60,8,182,25.4,0.947,21,tested\_negative

1,90,62,18,59,25.1,1.268,25,tested\_negative

1,125,70,24,110,24.3,0.221,25,tested\_negative

1,119,54,13,50,22.3,0.205,24,tested\_negative

5,116,74,29,0,32.3,0.66,35,tested\_positive

8,105,100,36,0,43.3,0.239,45,tested\_positive

5,144,82,26,285,32,0.452,58,tested\_positive

3,100,68,23,81,31.6,0.949,28,tested\_negative

1,100,66,29,196,32,0.444,42,tested\_negative

5,166,76,0,0,45.7,0.34,27,tested\_positive

1,131,64,14,415,23.7,0.389,21,tested\_negative

4,116,72,12,87,22.1,0.463,37,tested\_negative

4,158,78,0,0,32.9,0.803,31,tested\_positive

2,127,58,24,275,27.7,1.6,25,tested\_negative

3,96,56,34,115,24.7,0.944,39,tested\_negative

0,131,66,40,0,34.3,0.196,22,tested\_positive

3,82,70,0,0,21.1,0.389,25,tested\_negative

3,193,70,31,0,34.9,0.241,25,tested\_positive

4,95,64,0,0,32,0.161,31,tested\_positive

6,137,61,0,0,24.2,0.151,55,tested\_negative

5,136,84,41,88,35,0.286,35,tested\_positive

9,72,78,25,0,31.6,0.28,38,tested\_negative

5,168,64,0,0,32.9,0.135,41,tested\_positive

2,123,48,32,165,42.1,0.52,26,tested\_negative

4,115,72,0,0,28.9,0.376,46,tested\_positive

0,101,62,0,0,21.9,0.336,25,tested\_negative

8,197,74,0,0,25.9,1.191,39,tested\_positive

1,172,68,49,579,42.4,0.702,28,tested\_positive

6,102,90,39,0,35.7,0.674,28,tested\_negative

1,112,72,30,176,34.4,0.528,25,tested\_negative

1,143,84,23,310,42.4,1.076,22,tested\_negative

1,143,74,22,61,26.2,0.256,21,tested\_negative

0,138,60,35,167,34.6,0.534,21,tested\_positive

3,173,84,33,474,35.7,0.258,22,tested\_positive

1,97,68,21,0,27.2,1.095,22,tested\_negative

4,144,82,32,0,38.5,0.554,37,tested\_positive

1,83,68,0,0,18.2,0.624,27,tested\_negative

3,129,64,29,115,26.4,0.219,28,tested\_positive

1,119,88,41,170,45.3,0.507,26,tested\_negative

2,94,68,18,76,26,0.561,21,tested\_negative

0,102,64,46,78,40.6,0.496,21,tested\_negative

2,115,64,22,0,30.8,0.421,21,tested\_negative

8,151,78,32,210,42.9,0.516,36,tested\_positive

4,184,78,39,277,37,0.264,31,tested\_positive

0,94,0,0,0,0,0.256,25,tested\_negative

1,181,64,30,180,34.1,0.328,38,tested\_positive

0,135,94,46,145,40.6,0.284,26,tested\_negative

1,95,82,25,180,35,0.233,43,tested\_positive

2,99,0,0,0,22.2,0.108,23,tested\_negative

3,89,74,16,85,30.4,0.551,38,tested\_negative

1,80,74,11,60,30,0.527,22,tested\_negative

2,139,75,0,0,25.6,0.167,29,tested\_negative

1,90,68,8,0,24.5,1.138,36,tested\_negative

0,141,0,0,0,42.4,0.205,29,tested\_positive

12,140,85,33,0,37.4,0.244,41,tested\_negative

5,147,75,0,0,29.9,0.434,28,tested\_negative

1,97,70,15,0,18.2,0.147,21,tested\_negative

6,107,88,0,0,36.8,0.727,31,tested\_negative

0,189,104,25,0,34.3,0.435,41,tested\_positive

2,83,66,23,50,32.2,0.497,22,tested\_negative

4,117,64,27,120,33.2,0.23,24,tested\_negative

8,108,70,0,0,30.5,0.955,33,tested\_positive

4,117,62,12,0,29.7,0.38,30,tested\_positive

0,180,78,63,14,59.4,2.42,25,tested\_positive

1,100,72,12,70,25.3,0.658,28,tested\_negative

0,95,80,45,92,36.5,0.33,26,tested\_negative

0,104,64,37,64,33.6,0.51,22,tested\_positive

0,120,74,18,63,30.5,0.285,26,tested\_negative

1,82,64,13,95,21.2,0.415,23,tested\_negative

2,134,70,0,0,28.9,0.542,23,tested\_positive

0,91,68,32,210,39.9,0.381,25,tested\_negative

2,119,0,0,0,19.6,0.832,72,tested\_negative

2,100,54,28,105,37.8,0.498,24,tested\_negative

14,175,62,30,0,33.6,0.212,38,tested\_positive

1,135,54,0,0,26.7,0.687,62,tested\_negative

5,86,68,28,71,30.2,0.364,24,tested\_negative

10,148,84,48,237,37.6,1.001,51,tested\_positive

9,134,74,33,60,25.9,0.46,81,tested\_negative

9,120,72,22,56,20.8,0.733,48,tested\_negative

1,71,62,0,0,21.8,0.416,26,tested\_negative

8,74,70,40,49,35.3,0.705,39,tested\_negative

5,88,78,30,0,27.6,0.258,37,tested\_negative

10,115,98,0,0,24,1.022,34,tested\_negative

0,124,56,13,105,21.8,0.452,21,tested\_negative

0,74,52,10,36,27.8,0.269,22,tested\_negative

0,97,64,36,100,36.8,0.6,25,tested\_negative

8,120,0,0,0,30,0.183,38,tested\_positive

6,154,78,41,140,46.1,0.571,27,tested\_negative

1,144,82,40,0,41.3,0.607,28,tested\_negative

0,137,70,38,0,33.2,0.17,22,tested\_negative

0,119,66,27,0,38.8,0.259,22,tested\_negative

7,136,90,0,0,29.9,0.21,50,tested\_negative

4,114,64,0,0,28.9,0.126,24,tested\_negative

0,137,84,27,0,27.3,0.231,59,tested\_negative

2,105,80,45,191,33.7,0.711,29,tested\_positive

7,114,76,17,110,23.8,0.466,31,tested\_negative

8,126,74,38,75,25.9,0.162,39,tested\_negative

4,132,86,31,0,28,0.419,63,tested\_negative

3,158,70,30,328,35.5,0.344,35,tested\_positive

0,123,88,37,0,35.2,0.197,29,tested\_negative

4,85,58,22,49,27.8,0.306,28,tested\_negative

0,84,82,31,125,38.2,0.233,23,tested\_negative

0,145,0,0,0,44.2,0.63,31,tested\_positive

0,135,68,42,250,42.3,0.365,24,tested\_positive

1,139,62,41,480,40.7,0.536,21,tested\_negative

0,173,78,32,265,46.5,1.159,58,tested\_negative

4,99,72,17,0,25.6,0.294,28,tested\_negative

8,194,80,0,0,26.1,0.551,67,tested\_negative

2,83,65,28,66,36.8,0.629,24,tested\_negative

2,89,90,30,0,33.5,0.292,42,tested\_negative

4,99,68,38,0,32.8,0.145,33,tested\_negative

4,125,70,18,122,28.9,1.144,45,tested\_positive

3,80,0,0,0,0,0.174,22,tested\_negative

6,166,74,0,0,26.6,0.304,66,tested\_negative

5,110,68,0,0,26,0.292,30,tested\_negative

2,81,72,15,76,30.1,0.547,25,tested\_negative

7,195,70,33,145,25.1,0.163,55,tested\_positive

6,154,74,32,193,29.3,0.839,39,tested\_negative

2,117,90,19,71,25.2,0.313,21,tested\_negative

3,84,72,32,0,37.2,0.267,28,tested\_negative

6,0,68,41,0,39,0.727,41,tested\_positive

7,94,64,25,79,33.3,0.738,41,tested\_negative

3,96,78,39,0,37.3,0.238,40,tested\_negative

10,75,82,0,0,33.3,0.263,38,tested\_negative

0,180,90,26,90,36.5,0.314,35,tested\_positive

1,130,60,23,170,28.6,0.692,21,tested\_negative

2,84,50,23,76,30.4,0.968,21,tested\_negative

8,120,78,0,0,25,0.409,64,tested\_negative

12,84,72,31,0,29.7,0.297,46,tested\_positive

0,139,62,17,210,22.1,0.207,21,tested\_negative

9,91,68,0,0,24.2,0.2,58,tested\_negative

2,91,62,0,0,27.3,0.525,22,tested\_negative

3,99,54,19,86,25.6,0.154,24,tested\_negative

3,163,70,18,105,31.6,0.268,28,tested\_positive

9,145,88,34,165,30.3,0.771,53,tested\_positive

7,125,86,0,0,37.6,0.304,51,tested\_negative

13,76,60,0,0,32.8,0.18,41,tested\_negative

6,129,90,7,326,19.6,0.582,60,tested\_negative

2,68,70,32,66,25,0.187,25,tested\_negative

3,124,80,33,130,33.2,0.305,26,tested\_negative

6,114,0,0,0,0,0.189,26,tested\_negative

9,130,70,0,0,34.2,0.652,45,tested\_positive

3,125,58,0,0,31.6,0.151,24,tested\_negative

3,87,60,18,0,21.8,0.444,21,tested\_negative

1,97,64,19,82,18.2,0.299,21,tested\_negative

3,116,74,15,105,26.3,0.107,24,tested\_negative

0,117,66,31,188,30.8,0.493,22,tested\_negative

0,111,65,0,0,24.6,0.66,31,tested\_negative

2,122,60,18,106,29.8,0.717,22,tested\_negative

0,107,76,0,0,45.3,0.686,24,tested\_negative

1,86,66,52,65,41.3,0.917,29,tested\_negative

6,91,0,0,0,29.8,0.501,31,tested\_negative

1,77,56,30,56,33.3,1.251,24,tested\_negative

4,132,0,0,0,32.9,0.302,23,tested\_positive

0,105,90,0,0,29.6,0.197,46,tested\_negative

0,57,60,0,0,21.7,0.735,67,tested\_negative

0,127,80,37,210,36.3,0.804,23,tested\_negative

3,129,92,49,155,36.4,0.968,32,tested\_positive

8,100,74,40,215,39.4,0.661,43,tested\_positive

3,128,72,25,190,32.4,0.549,27,tested\_positive

10,90,85,32,0,34.9,0.825,56,tested\_positive

4,84,90,23,56,39.5,0.159,25,tested\_negative

1,88,78,29,76,32,0.365,29,tested\_negative

8,186,90,35,225,34.5,0.423,37,tested\_positive

5,187,76,27,207,43.6,1.034,53,tested\_positive

4,131,68,21,166,33.1,0.16,28,tested\_negative

1,164,82,43,67,32.8,0.341,50,tested\_negative

4,189,110,31,0,28.5,0.68,37,tested\_negative

1,116,70,28,0,27.4,0.204,21,tested\_negative

3,84,68,30,106,31.9,0.591,25,tested\_negative

6,114,88,0,0,27.8,0.247,66,tested\_negative

1,88,62,24,44,29.9,0.422,23,tested\_negative

1,84,64,23,115,36.9,0.471,28,tested\_negative

7,124,70,33,215,25.5,0.161,37,tested\_negative

1,97,70,40,0,38.1,0.218,30,tested\_negative

8,110,76,0,0,27.8,0.237,58,tested\_negative

11,103,68,40,0,46.2,0.126,42,tested\_negative

11,85,74,0,0,30.1,0.3,35,tested\_negative

6,125,76,0,0,33.8,0.121,54,tested\_positive

0,198,66,32,274,41.3,0.502,28,tested\_positive

1,87,68,34,77,37.6,0.401,24,tested\_negative

6,99,60,19,54,26.9,0.497,32,tested\_negative

0,91,80,0,0,32.4,0.601,27,tested\_negative

2,95,54,14,88,26.1,0.748,22,tested\_negative

1,99,72,30,18,38.6,0.412,21,tested\_negative

6,92,62,32,126,32,0.085,46,tested\_negative

4,154,72,29,126,31.3,0.338,37,tested\_negative

0,121,66,30,165,34.3,0.203,33,tested\_positive

3,78,70,0,0,32.5,0.27,39,tested\_negative

2,130,96,0,0,22.6,0.268,21,tested\_negative

3,111,58,31,44,29.5,0.43,22,tested\_negative

2,98,60,17,120,34.7,0.198,22,tested\_negative

1,143,86,30,330,30.1,0.892,23,tested\_negative

1,119,44,47,63,35.5,0.28,25,tested\_negative

6,108,44,20,130,24,0.813,35,tested\_negative

2,118,80,0,0,42.9,0.693,21,tested\_positive

10,133,68,0,0,27,0.245,36,tested\_negative

2,197,70,99,0,34.7,0.575,62,tested\_positive

0,151,90,46,0,42.1,0.371,21,tested\_positive

6,109,60,27,0,25,0.206,27,tested\_negative

12,121,78,17,0,26.5,0.259,62,tested\_negative

8,100,76,0,0,38.7,0.19,42,tested\_negative

8,124,76,24,600,28.7,0.687,52,tested\_positive

1,93,56,11,0,22.5,0.417,22,tested\_negative

8,143,66,0,0,34.9,0.129,41,tested\_positive

6,103,66,0,0,24.3,0.249,29,tested\_negative

3,176,86,27,156,33.3,1.154,52,tested\_positive

0,73,0,0,0,21.1,0.342,25,tested\_negative

11,111,84,40,0,46.8,0.925,45,testedpositive

2,112,78,50,140,39.4,0.175,24,tested\_negative

3,132,80,0,0,34.4,0.402,44,tested\_positive

2,82,52,22,115,28.5,1.699,25,tested\_negative

6,123,72,45,230,33.6,0.733,34,tested\_negative

0,188,82,14,185,32,0.682,22,tested\_positive

0,67,76,0,0,45.3,0.194,46,tested\_negative

1,89,24,19,25,27.8,0.559,21,tested\_negative

1,173,74,0,0,36.8,0.088,38,tested\_positive

1,109,38,18,120,23.1,0.407,26,tested\_negative

1,108,88,19,0,27.1,0.4,24,tested\_negative

6,96,0,0,0,23.7,0.19,28,tested\_negative

1,124,74,36,0,27.8,0.1,30,tested\_negative

7,150,78,29,126,35.2,0.692,54,tested\_positive

4,183,0,0,0,28.4,0.212,36,tested\_positive

1,124,60,32,0,35.8,0.514,21,tested\_negative

1,181,78,42,293,40,1.258,22,tested\_positive

1,92,62,25,41,19.5,0.482,25,tested\_negative

0,152,82,39,272,41.5,0.27,27,tested\_negative

1,111,62,13,182,24,0.138,23,tested\_negative

3,106,54,21,158,30.9,0.292,24,tested\_negative

3,174,58,22,194,32.9,0.593,36,tested\_positive

7,168,88,42,321,38.2,0.787,40,tested\_positive

6,105,80,28,0,32.5,0.878,26,tested\_negative

11,138,74,26,144,36.1,0.557,50,tested\_positive

3,106,72,0,0,25.8,0.207,27,tested\_negative

6,117,96,0,0,28.7,0.157,30,tested\_negative

2,68,62,13,15,20.1,0.257,23,tested\_negative

9,112,82,24,0,28.2,1.282,50,tested\_positive

0,119,0,0,0,32.4,0.141,24,tested\_positive

2,112,86,42,160,38.4,0.246,28,tested\_negative

2,92,76,20,0,24.2,1.698,28,tested\_negative

6,183,94,0,0,40.8,1.461,45,tested\_negative

0,94,70,27,115,43.5,0.347,21,tested\_negative

2,108,64,0,0,30.8,0.158,21,tested\_negative

4,90,88,47,54,37.7,0.362,29,tested\_negative

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5,128,80,0,0,34.6,0.144,45,tested\_negative

4,94,65,22,0,24.7,0.148,21,tested\_negative

7,114,64,0,0,27.4,0.732,34,tested\_positive

0,102,78,40,90,34.5,0.238,24,tested\_negative

2,111,60,0,0,26.2,0.343,23,tested\_negative

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10,92,62,0,0,25.9,0.167,31,tested\_negative

13,104,72,0,0,31.2,0.465,38,tested\_positive

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2,94,76,18,66,31.6,0.649,23,tested\_negative

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1,117,60,23,106,33.8,0.466,27,tested\_negative

5,123,74,40,77,34.1,0.269,28,tested\_negative

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7,142,90,24,480,30.4,0.128,43,tested\_positive

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4,127,88,11,155,34.5,0.598,28,tested\_negative

4,118,70,0,0,44.5,0.904,26,tested\_negative

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6,125,78,31,0,27.6,0.565,49,tested\_positive

1,168,88,29,0,35,0.905,52,tested\_positive

2,129,0,0,0,38.5,0.304,41,tested\_negative

4,110,76,20,100,28.4,0.118,27,tested\_negative

6,80,80,36,0,39.8,0.177,28,tested\_negative

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5,97,76,27,0,35.6,0.378,52,tested\_positive

4,83,86,19,0,29.3,0.317,34,tested\_negative

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5,117,86,30,105,39.1,0.251,42,tested\_negative

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8,120,86,0,0,28.4,0.259,22,tested\_positive

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11,120,80,37,150,42.3,0.785,48,tested\_positive

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1,126,60,0,0,30.1,0.349,47,tested\_positive

1,93,70,31,0,30.4,0.315,23,tested\_negative

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| **Note:** It is recommended that you save your response as you complete each question. |

**Question 2** (10 points)

Question 2 Unsaved

**Reduce Data (if necessary)**

Knowing the techniques that you will apply, reduce the data if necessary.

Explain operations and observations during this step.

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| **Note:** It is recommended that you save your response as you complete each question. |

**Question 3** (1 point)

Question 3 Unsaved

Question 3 options:

**Determine the mining task**

You have been told that the data mining task is

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 4**** (4 points)

Question 4 Unsaved

**Choose the data mining technique**

You will execute 4 techniques:

1. k-Nearest Neighbor
2. Naive Bayes
3. Logistic Regression
4. CART

For each of the techniques, describe any concerns that you have based on the prior steps in this process.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 5**** (10 points)

Question 5 Unsaved

**Use the algorithm K-NN**

Apply k-Nearest Neighbor to the data.

Document the choices (XLMiner options) that you made when executing the algorithm and copy the confusion matrix into your answer. Be sure to explain what options you chose and why.

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#### ****Question 6**** (10 points)

Question 6 Unsaved

**Use the algorithm Naive Bayes**

Apply Naive Bayes to the data.

Document the choices (XLMiner options) that you made when executing the algorithm and copy the confusion matrix into your answer. Be sure to explain what options you chose and why.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 7**** (10 points)

Question 7 Unsaved

**Use the algorithm Logistic Regression**

Apply Logistic Regression to the data.

Document the choices (XLMiner options) that you made when executing the algorithm and copy the confusion matrix into your answer. Be sure to explain what options you chose and why.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 8**** (10 points)

Question 8 Unsaved

**Use the algorithm CART**

Apply CART to the data.

Document the choices (XLMiner options) that you made when executing the algorithm and copy the confusion matrix into your answer. Be sure to explain what options you chose and why.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 9**** (9 points)

Question 9 Unsaved

**Tune the algorithm K-NN**

What tuning would you do in XLMiner on the k-NN result to improve performance?

Be sure to explain what options you might choose and why.

Include the confusion matrix after tuning in you answer.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 10**** (9 points)

Question 10 Unsaved

**Tune the algorithm NB**

What tuning would you do in XLMiner on the Naive Bayes result to improve performance?

Be sure to explain what options you might chose and why.

Include the confusion matrix after tuning in you answer.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 11**** (9 points)

Question 11 Unsaved

**Tune the algorithm Logistic Regression**

What tuning would you do in XLMiner on the Logistic Regression result to improve performance?

Be sure to explain what options you might choose and why.

Include the confusion matrix after tuning in you answer.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 12**** (9 points)

Question 12 Unsaved

**Tune the algorithm CART**

What tuning would you do in XLMiner on the CART result to improve performance?

Be sure to explain what options you might choose and why.

Include the confusion matrix after tuning in you answer.

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| **Note:** It is recommended that you save your response as you complete each question. |

#### ****Question 13**** (9 points)

Question 13 Unsaved

**Interpret the results**

Which of the results that you obtained would you recommend and why?

After you complete and save the exam, place your Excel workbook with XLMiner results into the dropbox [Mid-term](https://d2l.mu.edu/d2l/common/dialogs/quickLink/quickLink.d2l?ou=314584&type=dropbox&rcode=marquette-518597).