1. Title: Cardiac Arrhythmia Database

2. Sources:

(a) Original owners of Database:

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(c) Date: January, 1998

3. Past Usage:

1. H. Altay Guvenir, Burak Acar, Gulsen Demiroz, Ayhan Cekin

"A Supervised Machine Learning Algorithm for Arrhythmia Analysis"

Proceedings of the Computers in Cardiology Conference,

Lund, Sweden, 1997.

The aim is to determine the type of arrhythmia from

the ECG recordings.

4. Relevant Information:

This database contains 279 attributes, 206 of which are linear

valued and the rest are nominal.

Concerning the study of H. Altay Guvenir: "The aim is to distinguish

between the presence and absence of cardiac arrhythmia and to

classify it in one of the 16 groups. Class 01 refers to 'normal'

ECG classes 02 to 15 refers to different classes of arrhythmia

and class 16 refers to the rest of unclassified ones. For the

time being, there exists a computer program that makes such a

classification. However there are differences between the

cardiolog's and the programs classification. Taking the

cardiolog's as a gold standard we aim to minimise this difference

by means of machine learning tools."

The names and id numbers of the patients were recently

removed from the database.

5. Number of Instances: 452

6. Number of Attributes: 279

7. Attribute Information:

-- Complete attribute documentation:

1 Age: Age in years , linear

2 Sex: Sex (0 = male; 1 = female) , nominal

3 Height: Height in centimeters , linear

4 Weight: Weight in kilograms , linear

5 QRS duration: Average of QRS duration in msec., linear

6 P-R interval: Average duration between onset of P and Q waves

in msec., linear

7 Q-T interval: Average duration between onset of Q and offset

of T waves in msec., linear

8 T interval: Average duration of T wave in msec., linear

9 P interval: Average duration of P wave in msec., linear

Vector angles in degrees on front plane of:, linear

10 QRS

11 T

12 P

13 QRST

14 J

15 Heart rate: Number of heart beats per minute ,linear

Of channel DI:

Average width, in msec., of: linear

16 Q wave

17 R wave

18 S wave

19 R' wave, small peak just after R

20 S' wave

21 Number of intrinsic deflections, linear

22 Existence of ragged R wave, nominal

23 Existence of diphasic derivation of R wave, nominal

24 Existence of ragged P wave, nominal

25 Existence of diphasic derivation of P wave, nominal

26 Existence of ragged T wave, nominal

27 Existence of diphasic derivation of T wave, nominal

Of channel DII:

28 .. 39 (similar to 16 .. 27 of channel DI)

Of channels DIII:

40 .. 51

Of channel AVR:

52 .. 63

Of channel AVL:

64 .. 75

Of channel AVF:

76 .. 87

Of channel V1:

88 .. 99

Of channel V2:

100 .. 111

Of channel V3:

112 .. 123

Of channel V4:

124 .. 135

Of channel V5:

136 .. 147

Of channel V6:

148 .. 159

Of channel DI:

Amplitude , \* 0.1 milivolt, of

160 JJ wave, linear

161 Q wave, linear

162 R wave, linear

163 S wave, linear

164 R' wave, linear

165 S' wave, linear

166 P wave, linear

167 T wave, linear

168 QRSA , Sum of areas of all segments divided by 10,

( Area= width \* height / 2 ), linear

169 QRSTA = QRSA + 0.5 \* width of T wave \* 0.1 \* height of T

wave. (If T is diphasic then the bigger segment is

considered), linear

Of channel DII:

170 .. 179

Of channel DIII:

180 .. 189

Of channel AVR:

190 .. 199

Of channel AVL:

200 .. 209

Of channel AVF:

210 .. 219

Of channel V1:

220 .. 229

Of channel V2:

230 .. 239

Of channel V3:

240 .. 249

Of channel V4:

250 .. 259

Of channel V5:

260 .. 269

Of channel V6:

270 .. 279

8. Missing Attribute Values: Several. Distinguished with '?'.

9. Class Distribution:

Database: Arrhythmia

Class code : Class : Number of instances:

01 Normal 245

02 Ischemic changes (Coronary Artery Disease) 44

03 Old Anterior Myocardial Infarction 15

04 Old Inferior Myocardial Infarction 15

05 Sinus tachycardy 13

06 Sinus bradycardy 25

07 Ventricular Premature Contraction (PVC) 3

08 Supraventricular Premature Contraction 2

09 Left bundle branch block 9

10 Right bundle branch block 50

11 1. degree AtrioVentricular block 0

12 2. degree AV block 0

13 3. degree AV block 0

14 Left ventricule hypertrophy 4

15 Atrial Fibrillation or Flutter 5

16 Others 22