

1. Title: Chess End-Game -- King+Rook versus King+Pawn on a7 (usually abbreviated KRKPA7). The pawn on a7 means it is one square away from queening. It is the King+Rook's side (white) to move.
2. Sources:
 - (a) Database originally generated and described by Alen Shapiro.
 - (b) Donor/Coder: Rob Holte (holte@uottawa.bitnet). The database was supplied to Holte by Peter Clark of the Turing Institute in Glasgow (pete@turing.ac.uk).
 - (c) Date: 1 August 1989
3. Past Usage:
 - Alen D. Shapiro (1983,1987), "Structured Induction in Expert Systems", Addison-Wesley. This book is based on Shapiro's Ph.D. thesis (1983) at the University of Edinburgh entitled "The Role of Structured Induction in Expert Systems".
 - Stephen Muggleton (1987), "Structuring Knowledge by Asking Questions", pp.218-229 in "Progress in Machine Learning", edited by I. Bratko and Nada Lavrac, Sigma Press, Wilmslow, England SK9 5BB.
 - Robert C. Holte, Liane Acker, and Bruce W. Porter (1989), "Concept Learning and the Problem of Small Disjuncts", Proceedings of IJCAI. Also available as technical report AI89-106, Computer Sciences Department, University of Texas at Austin, Austin, Texas 78712.
4. Relevant Information:

The dataset format is described below. Note: the format of this database was modified on 2/26/90 to conform with the format of all the other databases in the UCI repository of machine learning databases.
5. Number of Instances: 3196 total
6. Number of Attributes: 36
7. Attribute Summaries:

Classes (2): -- White-can-win ("won") and White-cannot-win ("nowin").
I believe that White is deemed to be unable to win if the Black pawn can safely advance.
Attributes: see Shapiro's book.

8. Missing Attributes: -- none

9. Class Distribution:

In 1669 of the positions (52%), White can win.

In 1527 of the positions (48%), White cannot win.

The format for instances in this database is a sequence of 37 attribute values. Each instance is a board-descriptions for this chess endgame. The first 36 attributes describe the board. The last (37th) attribute is the classification: "win" or "nowin". There are 0 missing values. A typical board-description is

f,f,f,f,f,f,f,f,f,f,f,l,f,n,f,t,f,f,f,f,f,f,t,f,f,f,f,f,t,t,n,won

The names of the features do not appear in the board-descriptions. Instead, each feature corresponds to a particular position in the feature-value list. For example, the head of this list is the value for the feature "bkblk". The following is the list of features, in the order in which their values appear in the feature-value list:

[bkblk,bknwy,bkon8,bkona,bkspr,bkxbq,bkxcr,bkxwp,blxwp,bxqsq,cntxt,dsopp,dwipd,

hdchk,katri,mulch,qxmsq,r2ar8,reskd,reskr,rimmx,rkxwp,rxmsq,simpl,skach,skewr,
skrxp,spcop,slmt,thrsk,wkcti,wkna8,wknck,wkovi,wkpos,wtoeg]

In the file, there is one instance (board position) per line.

1 bkblk the BK is not in the way
 2 bknwy the BK is not in the BR's way
 3 bkon8the BK is on rank 8 in a position to aid the BR
 4 bkona the BK is on file A in a position to aid the BR
 5 bkspr the BK can support the BR
 6 bkxbqthe BK is not attacked in some way by the pro- moted WP
 7 bkxcr the BK can attack the critical square (b7)
 8 bkxwp the BK can attack the WP
 9 blxwp B attacks the WP (BR in direction x = -1 only)
 10 bxqsq one or more Black pieces control the queening square
 11 cntxt the WK is on an edge and not on a8
 12 dsoppthe kings are in normal opposition
 13 dwipd the WK distance to intersect point is too great
 14 hdchkthere is a good delay because there is a hidden check
 15 katri the BK controls the intersect point
 16 mulchB can renew the check to good advantage
 17 qxmsq the mating square is attacked in some way by the promoted
 WP
 18 r2ar8 the BR does not have safe access to file A or rank 8
 19 reskd the WK can be reskewed via a delayed skewer
 20 reskr the BR alone can renew the skewer threat
 21 rimmxthe BR can be captured safely
 22 rkxwpthe BR bears on the WP (direction x = -1 only)
 23 rxmsqthe BR attacks a mating square safely
 24 simpl a very simple pattern applies
 25 skach the WK can be skewered after one or more checks
 26 skewr there is a potential skewer as opposed to fork
 27 skrxp the BR can achieve a skewer or the BK attacks the WP
 28 spcopthere is a special opposition pattern present
 29 stlmt the WK is in stalemate
 30 thrsk there is a skewer threat lurking
 31 wkcti the WK cannot control the intersect point
 32 wkna8 the WK is on square a8
 33 wknck the WK is in check
 34 wkovl the WK is overloaded
 35 wkpos the WK is in a potential skewer position
 36 wtoegthe WK is one away from the relevant edge