1. Title of Database: Optical Recognition of Handwritten Digits
   Original, unnormalized version.

2. Source:
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   September 1998

3. Past Usage:
   C. Kaynak (1995) Methods of Combining Multiple Classifiers and Their
   Applications to Handwritten Digit Recognition,
   MSc Thesis, Institute of Graduate Studies in Science and
   Engineering, Bogazici University.

   E. Alpaydin, C. Kaynak (1998) Cascading Classifiers, Kybernetika,
   to appear. ftp://ftp.icsi.berkeley.edu/pub/ai/ethem/kyb.ps.Z

4. Relevant Information:
   We used preprocessing programs made available by NIST to extract
   normalized bitmaps of handwritten digits from a preprinted form. From
   a total of 43 people, 30 contributed to the training set and different
   13 to the test set. Inputs are centered and normalized as 32x32 bitmaps.

   In optdigits, Training, Validation and Writer-dependent sets are
   combined to form one large training set and the Writer-independent set
   is the test set.
   There to decrease dimensionality, 32x32 bitmaps are low-pass filtered
   and undersampled to get 8x8 integer matrices and converted to UCI
   format. This optdigits-orig is in the original format following that
   of NIST.

   For info on NIST preprocessing routines, see
   M. D. Garris, J. L. Blue, G. T. Candela, D. L. Dimmick, J. Geist,
   P. J. Grother, S. A. Janet, and C. L. Wilson, NIST Form-Based
   Handprint Recognition System, NISTIR 5469, 1994.

5. Number of Instances

optdigits-orig.tra	Training	1934
optdigits-orig.cv	Validation	946
optdigits-orig.wdep	Writer-dependent	943
optdigits-orig.windep	Writer-independent	1797

   All files contain a header which include relevant information. See
   NIST TR for details.

6. Number of Attributes
   1024 input+1 class attribute

7. For Each Attribute:
   All input attributes are integers in the range binary '0'/'1' with
   '\n' at the end of each row to visualize input.
   The last attribute is the class code 0..9

8. Missing Attribute Values
   None

9. Class Distribution

	tra	cv	wdep	windep
Class 0	189	87	100	178
Class 1	198	97	94	182
Class 2	195	92	93	177

Class 3	199	85	105	183
Class 4	186	114	87	181
Class 5	187	108	81	182
Class 6	195	87	95	181
Class 7	201	96	90	179
Class 8	180	91	109	174
Class 9	204	89	89	180