**Methods**

**Feature selection is divided into two parts:**

* **Attribute Evaluator**
* **Search Method.**

**Each section has multiple techniques from which to choose.**

**The attribute evaluator is the technique by which each attribute in your dataset (also called a column or feature) is evaluated in the context of the output variable (e.g. the class). The search method is the technique by which to try or navigate different combinations of attributes in the dataset in order to arrive on a short list of chosen features.**

**Some Attribute Evaluator techniques require the use of specific Search Methods. For example, the CorrelationAttributeEval technique used in the next section can only be used with a Ranker Search Method, that evaluates each attribute and lists the results in a rank order. When selecting different Attribute Evaluators, the interface may ask you to change the Search Method to something compatible with the chosen technique.**

**1)**

**Attribute Evaluator: CFsSubsetEval**

**Search Method : BestFit**

**Using full training set**

**Output:**

**Selected attributes: 4,21,41,68 : 4**

**3.0**

**20.0**

**40.0**

**67.0**

**2)**

**Attribute Evaluator: CorrelationAttributeEval**

**Search Method : Ranker**

**Using full training set**

**=== Attribute Selection on all input data ===**

**Search Method:**

**Attribute ranking.**

**Attribute Evaluator (supervised, Class (numeric): 83 82.0):**

**Correlation Ranking Filter**

**Ranked attributes:**

**0.20951 68 67.0**

**0.20527 21 20.0**

**0.2031 4 3.0**

**0.19991 73 72.0**

**0.19699 75 74.0**

**0.19684 36 35.0**

**0.19322 69 68.0**

**0.17781 70 69.0**

**0.17761 82 81.0**

**0.17699 72 71.0**

**0.17581 71 70.0**

**0.17098 74 73.0**

**0.16783 67 66.0**

**0.16737 35 34.0**

**0.16305 80 79.0**

**0.16083 49 48.0**

**0.15722 46 45.0**

**0.15663 79 78.0**

**0.15347 5 4.0**

**0.15024 45 44.0**

**0.15022 81 80.0**

**0.14838 37 36.0**

**0.14017 39 38.0**

**0.13812 47 46.0**

**0.13115 76 75.0**

**0.10836 41 40.0**

**0.10652 6 5.0**

**0.10514 40 39.0**

**0.09546 64 63.0**

**0.09117 65 64.0**

**0.06841 66 65.0**

**0.06295 77 76.0**

**0.06146 78 77.0**

**0.05521 38 37.0**

**0.05119 12 11.0**

**0.05036 1 0.0**

**0.03608 11 10.0**

**0.03267 13 12.0**

**0.03243 2 1.0**

**0.02618 14 13.0**

**0.02478 3 2.0**

**0.01247 55 54.0**

**0.01074 56 55.0**

**0.00802 42 41.0**

**0.00631 57 56.0**

**0.00596 10 9.0**

**0.00398 7 6.0**

**0.00359 8 7.0**

**0.00163 9 8.0**

**0 59 58.0**

**0 17 16.0**

**0 16 15.0**

**0 58 57.0**

**0 15 14.0**

**0 62 61.0**

**0 19 18.0**

**0 53 52.0**

**0 54 53.0**

**0 52 51.0**

**0 50 49.0**

**0 51 50.0**

**0 18 17.0**

**0 20 19.0**

**0 61 60.0**

**0 32 31.0**

**0 30 29.0**

**0 31 30.0**

**0 33 32.0**

**0 60 59.0**

**0 34 33.0**

**0 43 42.0**

**0 29 28.0**

**0 44 43.0**

**0 27 26.0**

**0 23 22.0**

**0 22 21.0**

**0 24 23.0**

**0 28 27.0**

**0 25 24.0**

**0 26 25.0**

**-0.00424 48 47.0**

**-0.01168 63 62.0**

**Selected attributes: 68,21,4,73,75,36,69,70,82,72,71,74,67,35,80,49,46,79,5,45,81,37,39,47,76,41,6,40,64,65,66,77,78,38,12,1,11,13,2,14,3,55,56,42,57,10,7,8,9,59,17,16,58,15,62,19,53,54,52,50,51,18,20,61,32,30,31,33,60,34,43,29,44,27,23,22,24,28,25,26,48,63 : 82**

**3)**

**Attribute Evaluator: PrincipalComponent**

**Search Method : Ranker**

**Using full training set**

**=== Attribute Selection on all input data ===**

**Search Method:**

**Attribute ranking.**

**Attribute Evaluator (unsupervised):**

**Principal Components Attribute Transformer**

**Correlation matrix**

**1 0.82 0.75 0.43 0.28 0.25 0.16 0.15 0.13 0.68 0.88 1 0.81 0.75 0.35 0.33 0.43 0.32 0.01 0.34 0.24 0.14 -0.13 0.39 0.41 0.2 0.1 0.45 0.16 0.14 0.13 -0.15 0.24 0.22 0.19 0.43 0.39 0.43 0.46 0.46 0.46 0.42 0.46 0.42 0.48 0.21 0.25 0.43 0.41 0.44 0.44**

**0.82 1 0.66 0.34 0.28 0.21 0.2 0.18 0.16 0.71 0.99 0.82 1 0.66 0.33 0.31 0.34 0.31 0.01 0.34 0.2 0.12 -0.12 0.38 0.39 0.19 0.1 0.43 0.18 0.17 0.15 -0.15 0.23 0.22 0.19 0.4 0.37 0.42 0.45 0.46 0.46 0.4 0.47 0.41 0.52 0.2 0.24 0.44 0.4 0.43 0.41**

**0.75 0.66 1 0.29 0.2 0.34 0.13 0.12 0.11 0.53 0.75 0.74 0.64 1 0.21 0.26 0.28 0.21 0 0.22 0.33 0.18 -0.08 0.27 0.28 0.14 0.12 0.3 0.12 0.1 0.11 -0.1 0.15 0.14 0.14 0.28 0.24 0.28 0.31 0.31 0.31 0.27 0.32 0.27 0.36 0.1 0.08 0.28 0.24 0.31 0.29**

**0.43 0.34 0.29 1 0.8 0.62 0.05 0.04 0.03 0.25 0.37 0.43 0.34 0.29 0.89 0.88 0.99 0.77 0.23 0.73 0.61 0.39 0.17 0.85 0.88 0.74 0.13 0.9 0.15 0.13 0.12 -0.07 0.52 0.5 0.41 0.89 0.91 0.93 0.92 0.92 0.92 0.92 0.91 0.92 0.83 0.39 0.42 0.89 0.87 0.84 0.86**

**0.28 0.28 0.2 0.8 1 0.53 0.04 0.03 0.03 0.18 0.29 0.28 0.28 0.2 0.74 0.98 0.8 0.96 0.7 0.89 0.52 0.36 0.25 0.73 0.76 0.65 0.12 0.77 0.13 0.11 0.11 -0.05 0.44 0.42 0.35 0.75 0.77 0.78 0.79 0.79 0.79 0.78 0.79 0.78 0.73 0.34 0.35 0.76 0.73 0.71 0.72**

**0.25 0.21 0.34 0.62 0.53 1 0.02 0.01 0.01 0.12 0.24 0.24 0.19 0.33 0.46 0.66 0.6 0.44 0.15 0.38 0.98 0.35 0.37 0.49 0.5 0.51 0.11 0.48 0.07 0.06 0.06 0.15 0.27 0.26 0.22 0.48 0.49 0.5 0.51 0.51 0.51 0.5 0.51 0.5 0.5 0.19 0.17 0.48 0.45 0.48 0.48**

**0.16 0.2 0.13 0.05 0.04 0.02 1 1 1 0.12 0.19 0.16 0.2 0.13 0.05 0.04 0.05 0.05 -0 0.05 0.02 0.01 -0.03 0.07 0.07 0.02 0.01 0.09 0.73 0.73 0.72 -0.03 0.36 0.37 0.37 0.07 0.06 0.07 0.07 0.07 0.07 0.06 0.07 0.06 0.07 0.02 0.03 0.09 0.06 0.07 0.07**

**0.15 0.18 0.12 0.04 0.03 0.01 1 1 1 0.11 0.18 0.15 0.18 0.12 0.05 0.03 0.04 0.04 -0 0.04 0.01 0 -0.03 0.06 0.07 0.02 0.01 0.08 0.72 0.73 0.72 -0.03 0.36 0.36 0.37 0.06 0.05 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.02 0.03 0.09 0.06 0.07 0.06**

**0.13 0.16 0.11 0.03 0.03 0.01 1 1 1 0.09 0.16 0.13 0.17 0.11 0.04 0.03 0.04 0.04 -0 0.04 0.01 0 -0.03 0.08 0.08 0.04 0.07 0.08 0.72 0.72 0.73 -0.02 0.35 0.36 0.38 0.05 0.04 0.05 0.05 0.05 0.05 0.05 0.06 0.05 0.05 0.01 0.02 0.08 0.05 0.05 0.05**

**0.68 0.71 0.53 0.25 0.18 0.12 0.12 0.11 0.09 1 0.72 0.68 0.71 0.53 0.25 0.2 0.25 0.22 0.01 0.24 0.13 0.04 -0.13 0.26 0.28 0.12 0.04 0.32 0.14 0.12 0.1 -0.14 0.18 0.17 0.14 0.43 0.27 0.29 0.31 0.31 0.31 0.28 0.32 0.3 0.35 0.17 0.21 0.29 0.28 0.33 0.31**

**0.88 0.99 0.75 0.37 0.29 0.24 0.19 0.18 0.16 0.72 1 0.88 0.98 0.75 0.34 0.32 0.37 0.32 0.01 0.34 0.23 0.13 -0.13 0.39 0.41 0.2 0.11 0.45 0.18 0.17 0.15 -0.15 0.24 0.23 0.2 0.41 0.38 0.43 0.46 0.47 0.47 0.41 0.48 0.42 0.52 0.2 0.24 0.44 0.4 0.44 0.43**

**1 0.82 0.74 0.43 0.28 0.24 0.16 0.15 0.13 0.68 0.88 1 0.81 0.75 0.36 0.33 0.43 0.32 0.01 0.34 0.24 0.12 -0.13 0.39 0.41 0.2 0.1 0.45 0.16 0.15 0.13 -0.15 0.24 0.22 0.19 0.43 0.39 0.43 0.46 0.46 0.46 0.42 0.46 0.42 0.48 0.21 0.25 0.44 0.41 0.44 0.44**

**0.81 1 0.64 0.34 0.28 0.19 0.2 0.18 0.17 0.71 0.98 0.81 1 0.64 0.33 0.3 0.34 0.32 0.01 0.34 0.2 0.09 -0.13 0.38 0.4 0.19 0.1 0.43 0.18 0.17 0.15 -0.15 0.24 0.22 0.2 0.4 0.37 0.42 0.45 0.46 0.46 0.4 0.47 0.41 0.51 0.2 0.24 0.44 0.4 0.42 0.41**

**0.75 0.66 1 0.29 0.2 0.33 0.13 0.12 0.11 0.53 0.75 0.75 0.64 1 0.21 0.26 0.28 0.21 0 0.23 0.33 0.15 -0.09 0.27 0.29 0.14 0.12 0.31 0.12 0.11 0.11 -0.1 0.16 0.15 0.14 0.28 0.25 0.28 0.31 0.31 0.31 0.27 0.32 0.27 0.36 0.1 0.09 0.28 0.25 0.31 0.29**

**0.35 0.33 0.21 0.89 0.74 0.46 0.05 0.05 0.04 0.25 0.34 0.36 0.33 0.21 1 0.79 0.89 0.76 0.2 0.73 0.47 0.28 -0.02 0.85 0.88 0.69 0.14 0.91 0.17 0.15 0.14 -0.11 0.54 0.52 0.43 0.93 0.99 0.96 0.94 0.93 0.94 0.98 0.92 0.97 0.78 0.41 0.46 0.9 0.94 0.85 0.9**

**0.33 0.31 0.26 0.88 0.98 0.66 0.04 0.03 0.03 0.2 0.32 0.33 0.3 0.26 0.79 1 0.87 0.94 0.6 0.87 0.65 0.39 0.27 0.78 0.81 0.69 0.14 0.81 0.13 0.12 0.11 -0.04 0.47 0.45 0.37 0.8 0.82 0.83 0.84 0.84 0.84 0.83 0.83 0.83 0.78 0.36 0.37 0.8 0.78 0.76 0.77**

**0.43 0.34 0.28 0.99 0.8 0.6 0.05 0.04 0.04 0.25 0.37 0.43 0.34 0.28 0.89 0.87 1 0.78 0.23 0.73 0.61 0.31 0.17 0.86 0.89 0.75 0.13 0.9 0.15 0.13 0.12 -0.07 0.52 0.5 0.41 0.9 0.92 0.93 0.92 0.92 0.92 0.93 0.92 0.92 0.83 0.39 0.43 0.9 0.87 0.85 0.87**

**0.32 0.31 0.21 0.77 0.96 0.44 0.05 0.04 0.04 0.22 0.32 0.32 0.32 0.21 0.76 0.94 0.78 1 0.74 0.93 0.44 0.25 0.02 0.74 0.77 0.62 0.13 0.79 0.14 0.12 0.12 -0.1 0.46 0.44 0.36 0.77 0.79 0.8 0.81 0.81 0.81 0.8 0.8 0.8 0.75 0.35 0.37 0.78 0.76 0.73 0.74**

**0.01 0.01 0 0.23 0.7 0.15 -0 -0 -0 0.01 0.01 0.01 0.01 0 0.2 0.6 0.23 0.74 1 0.65 0.16 0.07 0.04 0.22 0.23 0.26 0.06 0.21 0.02 0.02 0.03 -0.06 0.12 0.11 0.1 0.2 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.21 0.18 0.09 0.09 0.2 0.2 0.19 0.19**

**0.34 0.34 0.22 0.73 0.89 0.38 0.05 0.04 0.04 0.24 0.34 0.34 0.34 0.23 0.73 0.87 0.73 0.93 0.65 1 0.39 0.23 -0.02 0.71 0.74 0.53 0.13 0.77 0.14 0.12 0.12 -0.09 0.44 0.42 0.36 0.75 0.76 0.78 0.79 0.79 0.79 0.78 0.79 0.78 0.74 0.34 0.36 0.76 0.73 0.71 0.71**

**0.24 0.2 0.33 0.61 0.52 0.98 0.02 0.01 0.01 0.13 0.23 0.24 0.2 0.33 0.47 0.65 0.61 0.44 0.16 0.39 1 0.23 0.36 0.5 0.51 0.53 0.11 0.49 0.08 0.07 0.07 0.16 0.28 0.26 0.22 0.49 0.49 0.5 0.51 0.51 0.51 0.5 0.51 0.51 0.5 0.19 0.18 0.48 0.45 0.48 0.49**

**0.14 0.12 0.18 0.39 0.36 0.35 0.01 0 0 0.04 0.13 0.12 0.09 0.15 0.28 0.39 0.31 0.25 0.07 0.23 0.23 1 0.09 0.27 0.28 0.22 0.06 0.29 0.03 0.03 0.03 -0.02 0.16 0.15 0.12 0.28 0.3 0.31 0.31 0.31 0.31 0.31 0.31 0.3 0.3 0.13 0.11 0.28 0.26 0.27 0.27**

**-0.13 -0.12 -0.08 0.17 0.25 0.37 -0.03 -0.03 -0.03 -0.13 -0.13 -0.13 -0.13 -0.09 -0.02 0.27 0.17 0.02 0.04 -0.02 0.36 0.09 1 0.04 0.03 0.18 -0.02 -0.02 -0.03 -0.03 -0.02 0.21 -0.01 -0.01 -0.01 -0.02 -0.02 -0.01 -0.01 -0.01 -0.01 -0.01 -0.01 -0.01 -0 -0.01 -0.03 -0.01 -0.02 -0.01 -0.01**

**0.39 0.38 0.27 0.85 0.73 0.49 0.07 0.06 0.08 0.26 0.39 0.39 0.38 0.27 0.85 0.78 0.86 0.74 0.22 0.71 0.5 0.27 0.04 1 0.99 0.86 0.53 0.96 0.18 0.16 0.23 -0.1 0.51 0.49 0.5 0.84 0.86 0.89 0.9 0.9 0.9 0.88 0.9 0.88 0.82 0.38 0.41 0.85 0.84 0.81 0.81**

**0.41 0.39 0.28 0.88 0.76 0.5 0.07 0.07 0.08 0.28 0.41 0.41 0.4 0.29 0.88 0.81 0.89 0.77 0.23 0.74 0.51 0.28 0.03 0.99 1 0.84 0.45 0.98 0.19 0.17 0.22 -0.1 0.54 0.51 0.5 0.89 0.9 0.93 0.93 0.93 0.93 0.92 0.93 0.92 0.86 0.39 0.42 0.89 0.88 0.85 0.85**

**0.2 0.19 0.14 0.74 0.65 0.51 0.02 0.02 0.04 0.12 0.2 0.2 0.19 0.14 0.69 0.69 0.75 0.62 0.26 0.53 0.53 0.22 0.18 0.86 0.84 1 0.45 0.73 0.1 0.09 0.16 -0.11 0.37 0.36 0.38 0.66 0.69 0.7 0.69 0.69 0.69 0.7 0.68 0.69 0.6 0.31 0.34 0.65 0.67 0.61 0.64**

**0.1 0.1 0.12 0.13 0.12 0.11 0.01 0.01 0.07 0.04 0.11 0.1 0.1 0.12 0.14 0.14 0.13 0.13 0.06 0.13 0.11 0.06 -0.02 0.53 0.45 0.45 1 0.33 0.02 0.02 0.23 -0.02 0.07 0.06 0.28 0.12 0.13 0.16 0.17 0.17 0.17 0.15 0.18 0.14 0.15 0.03 0.03 0.12 0.13 0.12 0.11**

**0.45 0.43 0.3 0.9 0.77 0.48 0.09 0.08 0.08 0.32 0.45 0.45 0.43 0.31 0.91 0.81 0.9 0.79 0.21 0.77 0.49 0.29 -0.02 0.96 0.98 0.73 0.33 1 0.21 0.19 0.21 -0.1 0.57 0.54 0.5 0.92 0.93 0.96 0.97 0.97 0.97 0.95 0.97 0.95 0.9 0.41 0.44 0.93 0.91 0.89 0.88**

**0.16 0.18 0.12 0.15 0.13 0.07 0.73 0.72 0.72 0.14 0.18 0.16 0.18 0.12 0.17 0.13 0.15 0.14 0.02 0.14 0.08 0.03 -0.03 0.18 0.19 0.1 0.02 0.21 1 1 0.97 -0.04 0.8 0.81 0.82 0.18 0.16 0.18 0.18 0.18 0.18 0.17 0.18 0.17 0.17 0.07 0.08 0.2 0.18 0.19 0.18**

**0.14 0.17 0.1 0.13 0.11 0.06 0.73 0.73 0.72 0.12 0.17 0.15 0.17 0.11 0.15 0.12 0.13 0.12 0.02 0.12 0.07 0.03 -0.03 0.16 0.17 0.09 0.02 0.19 1 1 0.97 -0.03 0.8 0.81 0.82 0.16 0.15 0.16 0.16 0.16 0.16 0.16 0.16 0.15 0.15 0.06 0.07 0.19 0.17 0.17 0.17**

**0.13 0.15 0.11 0.12 0.11 0.06 0.72 0.72 0.73 0.1 0.15 0.13 0.15 0.11 0.14 0.11 0.12 0.12 0.03 0.12 0.07 0.03 -0.02 0.23 0.22 0.16 0.23 0.21 0.97 0.97 1 -0.03 0.77 0.78 0.84 0.14 0.14 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.05 0.06 0.16 0.15 0.14 0.15**

**-0.15 -0.15 -0.1 -0.07 -0.05 0.15 -0.03 -0.03 -0.02 -0.14 -0.15 -0.15 -0.15 -0.1 -0.11 -0.04 -0.07 -0.1 -0.06 -0.09 0.16 -0.02 0.21 -0.1 -0.1 -0.11 -0.02 -0.1 -0.04 -0.03 -0.03 1 -0.06 -0.06 -0.05 -0.1 -0.11 -0.1 -0.1 -0.1 -0.1 -0.11 -0.1 -0.1 -0.09 -0.05 -0.07 -0.09 -0.1 -0.09 -0.1**

**0.24 0.23 0.15 0.52 0.44 0.27 0.36 0.36 0.35 0.18 0.24 0.24 0.24 0.16 0.54 0.47 0.52 0.46 0.12 0.44 0.28 0.16 -0.01 0.51 0.54 0.37 0.07 0.57 0.8 0.8 0.77 -0.06 1 1 0.96 0.55 0.55 0.56 0.56 0.56 0.56 0.56 0.55 0.55 0.5 0.23 0.25 0.56 0.55 0.52 0.53**

**0.22 0.22 0.14 0.5 0.42 0.26 0.37 0.36 0.36 0.17 0.23 0.22 0.22 0.15 0.52 0.45 0.5 0.44 0.11 0.42 0.26 0.15 -0.01 0.49 0.51 0.36 0.06 0.54 0.81 0.81 0.78 -0.06 1 1 0.96 0.52 0.53 0.54 0.53 0.53 0.53 0.54 0.53 0.53 0.47 0.22 0.24 0.54 0.53 0.5 0.51**

**0.19 0.19 0.14 0.41 0.35 0.22 0.37 0.37 0.38 0.14 0.2 0.19 0.2 0.14 0.43 0.37 0.41 0.36 0.1 0.36 0.22 0.12 -0.01 0.5 0.5 0.38 0.28 0.5 0.82 0.82 0.84 -0.05 0.96 0.96 1 0.43 0.44 0.45 0.44 0.45 0.45 0.45 0.44 0.44 0.39 0.17 0.19 0.44 0.43 0.4 0.42**

**0.43 0.4 0.28 0.89 0.75 0.48 0.07 0.06 0.05 0.43 0.41 0.43 0.4 0.28 0.93 0.8 0.9 0.77 0.2 0.75 0.49 0.28 -0.02 0.84 0.89 0.66 0.12 0.92 0.18 0.16 0.14 -0.1 0.55 0.52 0.43 1 0.95 0.94 0.94 0.93 0.94 0.95 0.93 0.95 0.85 0.43 0.49 0.89 0.9 0.86 0.88**

**0.39 0.37 0.24 0.91 0.77 0.49 0.06 0.05 0.04 0.27 0.38 0.39 0.37 0.25 0.99 0.82 0.92 0.79 0.21 0.76 0.49 0.3 -0.02 0.86 0.9 0.69 0.13 0.93 0.16 0.15 0.14 -0.11 0.55 0.53 0.44 0.95 1 0.99 0.97 0.96 0.97 0.99 0.95 0.99 0.83 0.43 0.48 0.93 0.94 0.87 0.92**

**0.43 0.42 0.28 0.93 0.78 0.5 0.07 0.06 0.05 0.29 0.43 0.43 0.42 0.28 0.96 0.83 0.93 0.8 0.21 0.78 0.5 0.31 -0.01 0.89 0.93 0.7 0.16 0.96 0.18 0.16 0.15 -0.1 0.56 0.54 0.45 0.94 0.99 1 0.99 0.99 0.99 1 0.98 0.99 0.88 0.44 0.48 0.95 0.95 0.9 0.92**

**0.46 0.45 0.31 0.92 0.79 0.51 0.07 0.06 0.05 0.31 0.46 0.46 0.45 0.31 0.94 0.84 0.92 0.81 0.21 0.79 0.51 0.31 -0.01 0.9 0.93 0.69 0.17 0.97 0.18 0.16 0.15 -0.1 0.56 0.53 0.44 0.94 0.97 0.99 1 1 1 0.99 1 0.99 0.93 0.44 0.47 0.96 0.94 0.91 0.92**

**0.46 0.46 0.31 0.92 0.79 0.51 0.07 0.06 0.05 0.31 0.47 0.46 0.46 0.31 0.93 0.84 0.92 0.81 0.21 0.79 0.51 0.31 -0.01 0.9 0.93 0.69 0.17 0.97 0.18 0.16 0.15 -0.1 0.56 0.53 0.45 0.93 0.96 0.99 1 1 1 0.98 1 0.98 0.93 0.44 0.46 0.96 0.94 0.91 0.92**

**0.46 0.46 0.31 0.92 0.79 0.51 0.07 0.06 0.05 0.31 0.47 0.46 0.46 0.31 0.94 0.84 0.92 0.81 0.21 0.79 0.51 0.31 -0.01 0.9 0.93 0.69 0.17 0.97 0.18 0.16 0.15 -0.1 0.56 0.53 0.45 0.94 0.97 0.99 1 1 1 0.99 1 0.98 0.93 0.44 0.47 0.96 0.94 0.91 0.92**

**0.42 0.4 0.27 0.92 0.78 0.5 0.06 0.06 0.05 0.28 0.41 0.42 0.4 0.27 0.98 0.83 0.93 0.8 0.21 0.78 0.5 0.31 -0.01 0.88 0.92 0.7 0.15 0.95 0.17 0.16 0.15 -0.11 0.56 0.54 0.45 0.95 0.99 1 0.99 0.98 0.99 1 0.98 0.99 0.87 0.44 0.48 0.95 0.95 0.89 0.93**

**0.46 0.47 0.32 0.91 0.79 0.51 0.07 0.06 0.06 0.32 0.48 0.46 0.47 0.32 0.92 0.83 0.92 0.8 0.21 0.79 0.51 0.31 -0.01 0.9 0.93 0.68 0.18 0.97 0.18 0.16 0.15 -0.1 0.55 0.53 0.44 0.93 0.95 0.98 1 1 1 0.98 1 0.97 0.95 0.44 0.46 0.96 0.93 0.91 0.91**

**0.42 0.41 0.27 0.92 0.78 0.5 0.06 0.06 0.05 0.3 0.42 0.42 0.41 0.27 0.97 0.83 0.92 0.8 0.21 0.78 0.51 0.3 -0.01 0.88 0.92 0.69 0.14 0.95 0.17 0.15 0.14 -0.1 0.55 0.53 0.44 0.95 0.99 0.99 0.99 0.98 0.98 0.99 0.97 1 0.88 0.44 0.48 0.94 0.94 0.89 0.93**

**0.48 0.52 0.36 0.83 0.73 0.5 0.07 0.06 0.05 0.35 0.52 0.48 0.51 0.36 0.78 0.78 0.83 0.75 0.18 0.74 0.5 0.3 -0 0.82 0.86 0.6 0.15 0.9 0.17 0.15 0.14 -0.09 0.5 0.47 0.39 0.85 0.83 0.88 0.93 0.93 0.93 0.87 0.95 0.88 1 0.41 0.4 0.9 0.83 0.87 0.83**

**0.21 0.2 0.1 0.39 0.34 0.19 0.02 0.02 0.01 0.17 0.2 0.21 0.2 0.1 0.41 0.36 0.39 0.35 0.09 0.34 0.19 0.13 -0.01 0.38 0.39 0.31 0.03 0.41 0.07 0.06 0.05 -0.05 0.23 0.22 0.17 0.43 0.43 0.44 0.44 0.44 0.44 0.44 0.44 0.44 0.41 1 0.63 0.43 0.43 0.42 0.45**

**0.25 0.24 0.08 0.42 0.35 0.17 0.03 0.03 0.02 0.21 0.24 0.25 0.24 0.09 0.46 0.37 0.43 0.37 0.09 0.36 0.18 0.11 -0.03 0.41 0.42 0.34 0.03 0.44 0.08 0.07 0.06 -0.07 0.25 0.24 0.19 0.49 0.48 0.48 0.47 0.46 0.47 0.48 0.46 0.48 0.4 0.63 1 0.45 0.48 0.45 0.5**

**0.43 0.44 0.28 0.89 0.76 0.48 0.09 0.09 0.08 0.29 0.44 0.44 0.44 0.28 0.9 0.8 0.9 0.78 0.2 0.76 0.48 0.28 -0.01 0.85 0.89 0.65 0.12 0.93 0.2 0.19 0.16 -0.09 0.56 0.54 0.44 0.89 0.93 0.95 0.96 0.96 0.96 0.95 0.96 0.94 0.9 0.43 0.45 1 0.96 0.91 0.91**

**0.41 0.4 0.24 0.87 0.73 0.45 0.06 0.06 0.05 0.28 0.4 0.41 0.4 0.25 0.94 0.78 0.87 0.76 0.2 0.73 0.45 0.26 -0.02 0.84 0.88 0.67 0.13 0.91 0.18 0.17 0.15 -0.1 0.55 0.53 0.43 0.9 0.94 0.95 0.94 0.94 0.94 0.95 0.93 0.94 0.83 0.43 0.48 0.96 1 0.88 0.93**

**0.44 0.43 0.31 0.84 0.71 0.48 0.07 0.07 0.05 0.33 0.44 0.44 0.42 0.31 0.85 0.76 0.85 0.73 0.19 0.71 0.48 0.27 -0.01 0.81 0.85 0.61 0.12 0.89 0.19 0.17 0.14 -0.09 0.52 0.5 0.4 0.86 0.87 0.9 0.91 0.91 0.91 0.89 0.91 0.89 0.87 0.42 0.45 0.91 0.88 1 0.94**

**0.44 0.41 0.29 0.86 0.72 0.48 0.07 0.06 0.05 0.31 0.43 0.44 0.41 0.29 0.9 0.77 0.87 0.74 0.19 0.71 0.49 0.27 -0.01 0.81 0.85 0.64 0.11 0.88 0.18 0.17 0.15 -0.1 0.53 0.51 0.42 0.88 0.92 0.92 0.92 0.92 0.92 0.93 0.91 0.93 0.83 0.45 0.5 0.91 0.93 0.94 1**

**eigenvalue proportion cumulative**

**25.67151 0.50336 0.50336 -0.19369.0-0.19371.0-0.19370.0-0.19273.0-0.19268.0...**

**6.29296 0.12339 0.62675 0.35455.0+0.35254.0+0.34956.0+0.3256.0+0.3247.0...**

**5.06314 0.09928 0.72603 -0.33610.0-0.3210.0-0.3211.0-0.3191.0-0.31612.0...**

**2.2517 0.04415 0.77018 0.4385.0+0.42639.0+0.41641.0+0.21862.0+0.21734.0...**

**1.81727 0.03563 0.80582 0.60637.0+0.34836.0+0.33238.0+0.2874.0-0.2145.0...**

**1.55945 0.03058 0.83639 0.39247.0-0.3427.0-0.3396.0+0.32765.0-0.3188.0...**

**1.46042 0.02864 0.86503 -0.61347.0-0.29946.0-0.26544.0+0.26364.0-0.268.0...**

**1.15187 0.02259 0.88761 0.61776.0+0.59777.0+0.20847.0+0.19641.0-0.14140.0...**

**0.95378 0.0187 0.90632 0.69140.0-0.58762.0+0.19376.0+0.1572.0+0.13713.0...**

**0.83429 0.01636 0.92267 -0.68562.0-0.45340.0+0.39441.0+0.17946.0-0.16747.0...**

**0.77927 0.01528 0.93795 -0.46841.0-0.44640.0+0.34 13.0+0.3222.0+0.27339.0...**

**0.55397 0.01086 0.94882 -0.45441.0+0.3845.0+0.37439.0-0.31313.0+0.3059.0...**

**0.47377 0.00929 0.95811 -0.6519.0-0.2866.0+0.26875.0+0.25812.0+0.2561.0...**

**Eigenvectors**

**V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12 V13**

**-0.1053 0.1004 -0.3211 0.016 0.0098 0.0274 0.0331 0.0295 0.0033 0.0059 -0.0116 -0.166 -0.13 0.0**

**-0.1022 0.1146 -0.3188 -0.0145 0.0476 0.0131 0.0058 0.0447 -0.098 0.039 -0.24 0.1973 0.256 1.0**

**-0.0772 0.0956 -0.3118 0.1768 -0.0534 0.0875 0.0227 -0.0672 0.1574 -0.1169 0.3222 -0.3022 -0.0007 2.0**

**-0.1836 -0.062 0.0394 0.0668 -0.0653 -0.0612 0.0204 -0.0519 0.0609 0.065 -0.0407 -0.1179 -0.1104 3.0**

**-0.1627 -0.0747 0.0785 0.1872 0.2866 0.0472 0.0464 0.034 0.0167 0.0009 -0.1094 -0.0739 0.0096 4.0**

**-0.111 -0.0497 0.0105 0.4382 -0.2145 -0.0761 0.0726 0.0259 0.0616 0.0515 0.2067 0.384 0.0376 5.0**

**-0.0285 0.3251 0.0629 0.0641 0.1182 -0.3395 -0.2188 -0.0671 -0.0031 -0.0058 0.0224 -0.0066 -0.0269 6.0**

**-0.0273 0.3242 0.0673 0.0638 0.1176 -0.3417 -0.2194 -0.0668 -0.0008 -0.0066 0.0262 -0.0121 -0.029 7.0**

**-0.0257 0.3229 0.0761 0.0701 0.1093 -0.3178 -0.2595 -0.056 0.0012 -0.0192 0.0262 -0.0138 -0.0208 8.0**

**-0.0759 0.0914 -0.2762 -0.0497 0.0489 0.0275 0.0676 0.0985 -0.1026 0.109 -0.1689 0.3054 -0.6508 9.0**

**-0.1056 0.1169 -0.3356 0.0101 0.0332 0.0251 0.0106 0.0333 -0.0623 0.0198 -0.1509 0.093 0.1821 10.0**

**-0.1053 0.1007 -0.3202 0.0103 0.0115 0.0274 0.0311 0.0342 -0.0143 0.0181 -0.0034 -0.1681 -0.1327 11.0**

**-0.102 0.1151 -0.3156 -0.0256 0.0519 0.0122 0.0019 0.0525 -0.1267 0.057 -0.2341 0.202 0.2578 12.0**

**-0.0776 0.0962 -0.3115 0.1717 -0.0522 0.0888 0.0196 -0.0615 0.1369 -0.1035 0.3403 -0.3129 -0.0025 13.0**

**-0.1822 -0.0551 0.0603 -0.0992 -0.0375 -0.0533 -0.0005 -0.0777 -0.0077 0.0149 0.0339 -0.0268 -0.1386 20.0**

**-0.1728 -0.074 0.0659 0.2169 0.1805 0.0182 0.0486 0.0188 0.0334 0.0193 -0.0501 -0.0142 -0.0026 34.0**

**-0.1839 -0.0612 0.0404 0.0553 -0.0614 -0.058 0.0143 -0.0378 0.0004 0.1108 -0.0046 -0.1306 -0.1053 35.0**

**-0.165 -0.0637 0.0608 0.0819 0.3476 0.0827 0.0259 0.0054 -0.043 -0.0403 0.0511 0.0189 0.0103 36.0**

**-0.0553 -0.0565 0.0829 0.21 0.606 0.1915 0.0234 0.0994 -0.0327 -0.057 0.0879 0.0385 -0.0511 37.0**

**-0.1596 -0.0533 0.0416 0.0413 0.3319 0.0775 0.0328 -0.0194 -0.0668 -0.0872 0.0358 -0.001 0.0519 38.0**

**-0.1111 -0.0492 0.0127 0.4261 -0.211 -0.0716 0.0639 0.0457 -0.0412 0.116 0.2734 0.3744 0.0476 39.0**

**-0.0641 -0.0325 0.0106 0.1581 -0.0551 -0.0475 0.0567 -0.1412 0.6906 -0.4535 -0.4457 0.1147 -0.0811 40.0**

**-0.0052 -0.0509 0.0893 0.4159 -0.1345 -0.1076 0.0734 0.1964 -0.0819 0.3943 -0.4681 -0.4543 0.04 41.0**

**-0.1795 -0.0335 0.0428 -0.0089 -0.0814 0.1308 -0.2652 0.0521 -0.0237 -0.0069 -0.029 -0.0118 -0.011 44.0**

**-0.1856 -0.0353 0.0395 -0.0221 -0.0698 0.0945 -0.2096 0.0234 -0.026 -0.0073 -0.0242 -0.0089 -0.0191 45.0**

**-0.143 -0.0633 0.09 0.0968 -0.0893 0.1189 -0.2988 0.1374 0.0385 0.1789 -0.0048 0.0247 -0.1225 46.0**

**-0.0416 0.0125 0.0088 0.0509 -0.1336 0.392 -0.6131 0.2083 -0.0091 -0.1673 -0.0506 0.0128 0.0074 47.0**

**-0.1903 -0.0284 0.024 -0.0605 -0.0487 0.0432 -0.1143 -0.0316 -0.0425 -0.0404 -0.0236 -0.0195 0.0091 48.0**

**-0.0548 0.3523 0.136 0.0065 -0.0115 0.0557 0.1159 0.0207 0.0099 0.0173 -0.0037 0.018 0.0099 54.0**

**-0.0513 0.3537 0.14 0.0066 -0.0117 0.0558 0.1164 0.021 0.0114 0.018 -0.0007 0.012 0.0071 55.0**

**-0.0506 0.3495 0.1453 0.023 -0.0374 0.1347 -0.0248 0.0666 0.0129 -0.0193 -0.0078 0.0081 0.0123 56.0**

**0.0219 -0.0228 0.0581 0.2179 -0.174 -0.118 0.1207 0.1084 -0.5866 -0.6848 -0.1115 -0.102 -0.1103 62.0**

**-0.1232 0.2142 0.1535 -0.053 -0.085 0.2145 0.2583 0.0094 0.0046 0.0159 -0.0064 -0.0053 0.0068 63.0**

**-0.1186 0.2197 0.157 -0.054 -0.086 0.2187 0.263 0.0146 0.0063 0.018 -0.0057 -0.01 0.0055 64.0**

**-0.1043 0.2367 0.1598 -0.0304 -0.1156 0.3273 0.124 0.077 0.0093 -0.0189 -0.016 -0.0049 0.0127 65.0**

**-0.1847 -0.0417 0.0172 -0.0813 -0.0222 -0.0568 0.0331 -0.0324 -0.0261 0.0172 0.0139 0.0553 -0.2802 66.0**

**-0.1877 -0.0548 0.046 -0.0877 -0.0318 -0.0634 0.0121 -0.0651 -0.0038 0.0043 0.0302 -0.0215 -0.0954 67.0**

**-0.1917 -0.0477 0.0307 -0.0778 -0.0309 -0.0478 -0.0016 -0.0659 -0.0137 -0.0137 0.0078 -0.0326 0.0083 68.0**

**-0.1931 -0.0447 0.014 -0.0655 -0.0286 -0.0436 -0.0053 -0.0615 -0.0229 -0.0223 -0.0074 -0.0001 0.0742 69.0**

**-0.1928 -0.0435 0.0145 -0.0667 -0.0281 -0.0393 -0.0086 -0.0682 -0.0283 -0.023 -0.0152 -0.0071 0.0991 70.0**

**-0.193 -0.0442 0.0142 -0.066 -0.0284 -0.0417 -0.0067 -0.0645 -0.0253 -0.0226 -0.0108 -0.0031 0.0851 71.0**

**-0.1909 -0.0505 0.0365 -0.0817 -0.0313 -0.0538 0.0035 -0.0658 -0.0101 -0.007 0.0162 -0.0286 -0.0302 72.0**

**-0.1925 -0.042 0.0074 -0.0604 -0.0269 -0.039 -0.0084 -0.0634 -0.0269 -0.0283 -0.0195 0.0009 0.122 73.0**

**-0.1906 -0.0522 0.0319 -0.0781 -0.0293 -0.0604 0.01 -0.0664 -0.014 -0.0035 0.018 -0.0062 -0.0339 74.0**

**-0.1795 -0.0304 -0.0313 -0.0239 -0.0187 -0.0331 0.0041 -0.0655 -0.0375 -0.0429 -0.0502 0.0656 0.2685 75.0**

**-0.0885 -0.031 0.0055 -0.1374 0.0076 -0.2053 0.079 0.6169 0.1931 -0.1058 0.1368 -0.0362 0.2244 76.0**

**-0.0951 -0.0272 -0.0004 -0.1737 0.0155 -0.2006 0.0755 0.5972 0.1317 -0.0457 0.0724 0.0028 -0.1307 77.0**

**-0.187 -0.0331 0.0226 -0.0777 -0.0219 -0.0707 0.0243 -0.0804 -0.0499 -0.0027 -0.0142 -0.0296 0.1303 78.0**

**-0.1834 -0.0431 0.034 -0.1062 -0.0308 -0.0588 0.015 -0.0523 -0.043 0.0139 0.0147 -0.0397 -0.0036 79.0**

**-0.1791 -0.0345 0.0028 -0.066 -0.0362 -0.0712 0.0345 -0.0521 -0.0284 -0.0051 0.0303 -0.0098 0.0427 80.0**

**-0.1817 -0.0381 0.0146 -0.0814 -0.0395 -0.0819 0.0454 -0.0215 -0.0105 0.0109 0.0524 -0.0198 -0.033 81.0**

**Ranked attributes:**

**0.4966 1 -0.19369.0-0.19371.0-0.19370.0-0.19273.0-0.19268.0...**

**0.3732 2 0.35455.0+0.35254.0+0.34956.0+0.3256.0+0.3247.0...**

**0.274 3 -0.33610.0-0.3210.0-0.3211.0-0.3191.0-0.31612.0...**

**0.2298 4 0.4385.0+0.42639.0+0.41641.0+0.21862.0+0.21734.0...**

**0.1942 5 0.60637.0+0.34836.0+0.33238.0+0.2874.0-0.2145.0...**

**0.1636 6 0.39247.0-0.3427.0-0.3396.0+0.32765.0-0.3188.0...**

**0.135 7 -0.61347.0-0.29946.0-0.26544.0+0.26364.0-0.268.0...**

**0.1124 8 0.61776.0+0.59777.0+0.20847.0+0.19641.0-0.14140.0...**

**0.0937 9 0.69140.0-0.58762.0+0.19376.0+0.1572.0+0.13713.0...**

**0.0773 10 -0.68562.0-0.45340.0+0.39441.0+0.17946.0-0.16747.0...**

**0.062 11 -0.46841.0-0.44640.0+0.34 13.0+0.3222.0+0.27339.0...**

**0.0512 12 -0.45441.0+0.3845.0+0.37439.0-0.31313.0+0.3059.0...**

**0.0419 13 -0.6519.0-0.2866.0+0.26875.0+0.25812.0+0.2561.0...**

**Selected attributes: 1,2,3,4,5,6,7,8,9,10,11,12,13 : 13**

**4)**

**Attribute Evaluator: ReliefAttributeEval**

**Search Method : Ranker**

**Using full training set**

**Output:**

**=== Attribute Selection on all input data ===**

**Search Method:**

**Attribute ranking.**

**Attribute Evaluator (supervised, Class (numeric): 83 82.0):**

**ReliefF Ranking Filter**

**Instances sampled: all**

**Number of nearest neighbours (k): 10**

**Equal influence nearest neighbours**

**Ranked attributes:**

**0.064976 82 81.0**

**0.058359 78 77.0**

**0.046667 81 80.0**

**0.045262 79 78.0**

**0.045212 4 3.0**

**0.044994 21 20.0**

**0.042901 36 35.0**

**0.042139 80 79.0**

**0.040393 6 5.0**

**0.038229 68 67.0**

**0.037824 41 40.0**

**0.037367 67 66.0**

**0.037285 77 76.0**

**0.036682 40 39.0**

**0.035299 75 74.0**

**0.032854 73 72.0**

**0.032825 49 48.0**

**0.031552 76 75.0**

**0.03073 69 68.0**

**0.030106 74 73.0**

**0.028721 35 34.0**

**0.027019 71 70.0**

**0.02697 70 69.0**

**0.026765 72 71.0**

**0.025998 12 11.0**

**0.024545 1 0.0**

**0.02447 46 45.0**

**0.022657 47 46.0**

**0.02014 5 4.0**

**0.019302 45 44.0**

**0.017573 37 36.0**

**0.015107 3 2.0**

**0.014641 14 13.0**

**0.013772 39 38.0**

**0.013461 11 10.0**

**0.009551 2 1.0**

**0.009513 64 63.0**

**0.008855 65 64.0**

**0.008298 38 37.0**

**0.007653 13 12.0**

**0.005973 66 65.0**

**0.004719 10 9.0**

**0.003983 55 54.0**

**0.003027 56 55.0**

**0.002389 42 41.0**

**0.00193 57 56.0**

**0.001009 48 47.0**

**0 19 18.0**

**0 22 21.0**

**0 23 22.0**

**0 20 19.0**

**0 16 15.0**

**0 18 17.0**

**0 15 14.0**

**0 25 24.0**

**0 17 16.0**

**0 24 23.0**

**0 60 59.0**

**0 26 25.0**

**0 50 49.0**

**0 61 60.0**

**0 43 42.0**

**0 51 50.0**

**0 52 51.0**

**0 53 52.0**

**0 54 53.0**

**0 58 57.0**

**0 27 26.0**

**0 44 43.0**

**0 62 61.0**

**0 32 31.0**

**0 59 58.0**

**0 29 28.0**

**0 28 27.0**

**0 31 30.0**

**0 30 29.0**

**0 33 32.0**

**0 34 33.0**

**-0.00029 8 7.0**

**-0.000315 7 6.0**

**-0.000521 9 8.0**

**-0.003924 63 62.0**

**Selected attributes: 82,78,81,79,4,21,36,80,6,68,41,67,77,40,75,73,49,76,69,74,35,71,70,72,12,1,46,47,5,45,37,3,14,39,11,2,64,65,38,13,66,10,55,56,42,57,48,19,22,23,20,16,18,15,25,17,24,60,26,50,61,43,51,52,53,54,58,27,44,62,32,59,29,28,31,30,33,34,8,7,9,63 : 82**