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Bayes' Approach on Government Job Selection Procedure In India

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ABSTRACT: In this paper, we have discussed Government Job Selection procedure in India through Bayes' theorem, or the related likelihood ratio, is the key to almost any procedure for extracting information from data. Bayes' Theorem lets us work backward from measured results to deduce what might have caused them. It will be the basis of most of our later model building and testing [17].

KEYWORDS: Bayes' Theorem, Strength, Certainty, and Coverage Factor, Flow graph.

I. INDTRODUCTION OF BAYES' THEOREM

Bayes' Theorem, or the related likelihood ratio, is the key to almost any procedure for extracting information from data. Bayes' Theorem lets us work backward from measured results to deducewhat might have caused them. It will be the basis of most of our later model building and testing. It UCalgary (2003) is the work of Rev. Thomas Bayes (St.Andrews, 2003), about whom only a modest amount is known, but he has the perhaps unique distinction that two-thirds of his publications were posthumous and the remaining third anonymous.

Every decision table describes decisions (actions, results etc.) determined, when some conditions are satisfied. In other words each row of the decision table specifies a decision rule which determines decisions in terms of conditions. In what follows we will describe decision rules more exactly.Let $S = (U, C, D)$ be a decision table. Every $x \in U$ determines a sequence $c_1(x),\ldots,c_n(x), d_1(x),\ldots,d_m(x)$ where $\{c_1,\ldots,c_n\} = C$ and $\{d_1,\ldots,d_m\} = D$. The sequence will be called a *decision rule induced byx* (in S) and denoted by $c_1(x),\ldots,c_n(x) \rightarrow d_1(x),\ldots,d_m(x)$ or in short $C \rightarrow_x D$.The number $supp_x(C,D) = |C(x) \cap D(x)|$ will be called a *support* of the decision rule $C \rightarrow_x D$ and the number $\sigma_x(C,D) = \frac{supp_x(C,D)}{|U|}$,will be referred to as the *strength* of the decision rule $C \rightarrow_x D$, where $|X|$ denotes the cardinality of X. With every decision rule $C \rightarrow_x D$ we associate the *certainty factor* of the decision rule, denoted $cer_x(C, D)$ and defined as follows: $cer_x(C,D) = \frac{|C(x) \cap D(x)|}{|C(x)|} = \frac{supp_x(C,D)}{|C(x)|} = \frac{\sigma_x(C,D)}{\pi(C(x))}$,where $\pi(C(x)) = \frac{|C(x)|}{|U|}$.The certainty factor may be interpreted as a conditional probability that y belongs to $D(x)$ given y belongs to $C(x)$, symbolically $\pi_x(D|C)$. If $cer_x(C, D) = 1$, then $C \rightarrow_x D$ will be called a *certain decision* rule in S; if $0 < cer_x(C, D) < 1$ the decision rule will be referred to as an *uncertain decision rule* in S.Besides, we will also use a *coverage factor* of the decision rule, denoted $cov_x(C,D)$ defined as $cov_x(C,D) = \frac{|C(x) \cap D(x)|}{|D(x)|} = \frac{supp_x(C,D)}{|D(x)|} = \frac{\sigma_x(C,D)}{\pi(D(x))}$ where $\pi(D(x)) = \frac{|D(x)|}{|U|}$ .Similarly

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$cov_x(C,D) = \pi_x(C \mid D)$. We need also *approximate equivalence* of formulas which is defined as follows: $\Phi \equiv_k \Psi$ if and only if $cer(\Phi, \Psi) = cov(\Phi, \Psi) = k$. Besides, we define also *approximate equivalence* of formulas with the *accuracy* ε $(0 \le \varepsilon \le 1)$,which is defined as follows: $\Phi \equiv_{k,\varepsilon} \Psi$ if and only if $k = min\{cer(\Phi, \Psi), cov(\Phi, \Psi)\}$ and $|cer(\Phi, \Psi) - cov(\Phi, \Psi)| \le \varepsilon$.***[12,13,14,15]***

II . RELATED WORK

In this article we will illustrate an idea which is based on Government job selection in India. Here, we have taken 1000 examination candidates (X1,X2,…..,X11) who are preparing them for government job examination in India. For some government rules each candidate have to fulfil each condition or criteria for getting government job in India. These conditions are K=Knowledge/ Intelligence, C=Cast, D= Degree, M=Percentage of marks, E= exam Rank. If each criteria is satisfy then candidate will selected for government job. In Table one the value of each criteria based on Md= Medium, Gd= Good, Vgd= Verygood , ST= Schedule Tribe, SC= Schedule Cast, Gen= General, Hnd=Physical Handicap, OBC= Other Backward Cast, Passed and Fail.

Candidates	K	C	D	M	E	Decision	Support	Strength
X1	Md	ST	Md	Md	Pass	Selected	230	0.230
X2	Md	Gen	Md	Md	Fail	Rejected	110	0.110
X3	Gd	SC	Gd	Gd	Pass	Selected	50	0.050
X4	Gd	Gen	Gd	Gd	Fail	Rejected	60	0.060
X5	Vgd	Gen	Vgd	Vgd	Pass	Selected	96	0.096
X6	Md	Gen	Vgd	Gd	Fail	Rejected	90	0.090
X7	Vgd	Gen	Vgd	Vgd	Pass	Selected	70	0.070
X8	Vgd	ST/SC	Gd	Gd	Pass	Selected	80	0.080
X9	Md	Hnd	Gd	Gd	Pass	Selected	85	0.085
X10	Gd	OBC	Gd	Gd	Fail	Rejected	65	0.065
X11	Gd	OBC	Vgd	Vgd	Pass	Selected	64	0.064

Table 1: Decision Table Of Examination Candidates.

III . DECISION ALGORITHM ASSOCIATED WITH RESPECT OF TABLE 1

X1)if (k=Md, C= ST, D=Md, M= Md, E=Pass) then (Decision is Selected)
X2) if (k=Md, C= Gen, D=Md, M=Md, E=Fail) then (Decision is Rejected)
X3) if (k=Gd, C= SC, D=Gd, M=,Gd, E=Pass) then (Decision is Selected)
X4)if (k=Md, C= Gen, D=Gd, M= Gd, E=Fail)then (Decision is Rejected)
X5)if (k=Vgd, C= Gen, D=Vgd, M=Vgd, E=Pass) then (Decision is Selected)
X6)if (k=Md, C= Gen, D=Vgd, M= Gd, E=Fail) then (Decision is Rejected)
X7)if (k=Vgd, C= Gen, M=Vgd, E=Pass) then (Decision is Selected)
X8)if (k=Vgd, C= ST/SC, E=Pass) then (Decision is Selected)
X9)if (k=Md, C= Hnd, E=Pass) then (Decision is Selected)
X10)if (k=Gd, C= OBC, D=Gd, M=Gd, E=Fail) then (Decision is Rejected)
X11)if (k=Gd, C= OBC, D=Vgd, M=Vgd, E=Pass) then (Decision is Selected)

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Candidates	Strength	Certainty
X 1	0.230	0.75
X2	0.110	0.25
X3	0.050	0.65
X4	0.060	0.35
X5	0.096	0.15
X6	0.090	0.85
X7	0.070	1.00
X8	0.080	1.00
X9	0.085	1.00
X10	0.065	0.83
X11	0.064	0.17

Table 2: Strength & Certainty of Decision Table1

Now Let Calculate The Inverse Decision Algorithm in below:

X1')if**(**Decision is Selected) then (k=Md, C= ST, D=Md, M= Md, E=Pass).
X2') if **(**Decision is Rejected) then (k=Md, C= Gen, D=Md, M= Md, E=Fail)
X3') if **(**Decision is Selected) then(k=Gd, C= SC, D=Gd, M=,Gd, E=Pass)
X4')if**(**Decision is Rejected) then (k=Md, C= Gen, D=Gd, M= Gd, E=Fail)
X5')if**(**Decision is Selected) then (k=Vgd, C= Gen, D=Vgd, M=Vgd, E=Pass)
X6')if **(**Decision is Rejected) then (k=Md, C= Gen, D=Vgd, M= Gd, E=Fail)
X7')if**(**Decision is Selected) then (k=Vgd, C= Gen, M=Vgd, E=Pass)
X8')if**(**Decision is Selected) then (k=Vgd, C= ST/SC, E=Pass)
X9')if**(**Decision is Selected) then (k=Md, C= Hnd, E=Pass)
X10')if**(**Decision is Rejected) then (k=Gd, C= OBC, D=Gd, M=Gd, E=Fail)
X11')if**(**Decision is Selected) then (k=Gd, C= OBC, D=Vgd, M=Vgd, E=Pass)

Candidates	Strength	Coverage
X 1	0.230	0.90
X2	0.110	0.16
X3	0.050	0.88
X4	0.060	0.21
X5	0.096	0.17
X6	0.090	0.95
X7	0.070	0.92
X8	0.080	0.89
X9	0.085	0.91
X10	0.065	0.95
X11	0.064	0.19

Table 3: Strength & Coverage of Decision Table1

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IV. ALL OVER STRENGTH, CERTAINTY AND COVERAGE FACTORS OF DECISION TABLE 1 IS:

Candidates	Strength	Certainty	Coverage
X 1	0.230	0.75	0.90
X2	0.110	0.25	0.16
X3	0.050	0.65	0.88
X4	0.060	0.35	0.21
X5	0.096	0.15	0.17
X6	0.090	0.85	0.95
X7	0.070	1.00	0.92
X8	0.080	1.00	0.89
X9	0.085	1.00	0.91
X10	0.065	0.83	0.95
X11	0.064	0.17	0.19

Table 4: Strength, Certainty and Coverage factor of Decision Table

V. FLOWGRAPH OF DECISION TABLE

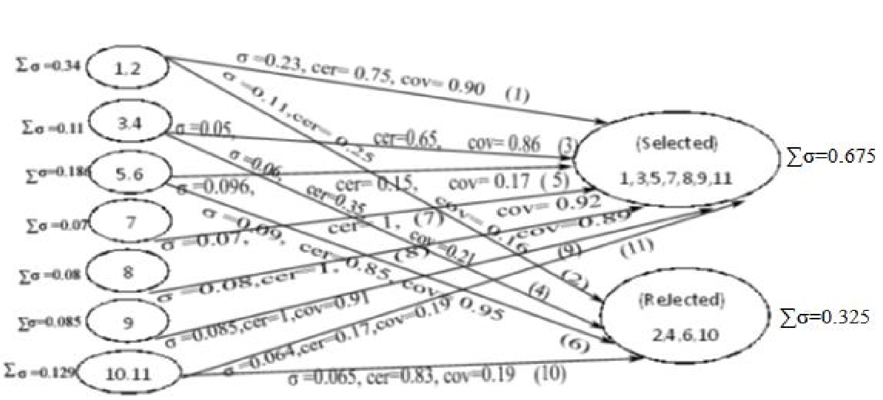

Fig 1: Flow Graph Of Decision Table

VI. CONCLUSION

In this paper, from above discussion we can reach ultimate solution that for getting Government job in India some criteria are most important to qualify the examination test. With respect of some important criteria we got "X6, X10,X7,X9" are eligible to clear the exam test but X2,X5,X11,X4 these candidates are not properly eligible to clear the exam for getting the job and those we are succeed to achieve the goal through Bayes' Theorem which actually expertism evolutionary method which help to reach actual decision.

REFERENCES

1 .Duda, R.O. and Hart, P.E. Pattern Classification and Scene Analysis, Wiley, NewYork, 1973.

2. Good, I.J.,The Estimation of Probabilities: An Essay on Modern Bayesian Methods. M.I.T. Press. 1965.

3 Greco, S., Matarazzo, B. and Slowinski, R. Parameterized rough set model using rough membership and Bayesian confirmation measures, International Journal of Approximate Reasoning, 49, 285-300, 2009.

4 Herbert, J.P. and Yao, J.T. Game-theoretic risk analysis in decision-theoretic rough sets, Proceedings of RSKT'08, LNAI 5009, 132-139, 2008.

5. Herbert, J.P. and Yao, J.T. Game-theoretic rough sets, Fundamental Informaticae, 2009.

6.Pawlak, Z. Rough sets, International Journal of Computer and Information Sciences, 11, 341-356, 1982.

7.Pawlak, Z. Rough Sets, Theoretical Aspects of Reasoning about Data, Dordrecht: Kluwer Academic Publishers, 1991.

8.Pawlak, Z., Wong, S.K.M. and Ziarko, W. Rough sets: probabilistic versus deterministic approach, International Journal of Man-Machine Studies, 29, 81-95,1988.

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(An ISO 3297: 2007 Certified Organization)

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9. Pawlak, Z. and Skowron, A. Rough membership functions, in: Yager, R.R., Fedrizzi, M. and Kacprzyk, J., Eds., Advances in the Dempster-Shafer Theory of Evidence, John Wiley and Sons, New York, 251-271, 1994.
10.Slezak, D. Rough sets and Bayes factor, LNCS Transactions on Rough Sets III, LNCS 3400, 202-229, 2005.
11. G. E. P. Box, G. C. Tiao: Bayesian Inference in: Statistical Analysis, John Wiley and Sons, Inc., New York, Chichester, Brisbane, Toronto, Singapore, 1992
12. M. Berthold, D. J. Hand: Intelligent Data Analysis, an Introduction, Springer-Verlag, Berlin, eidelberg, New York, 1999
13. Z. Pawlak: Rough Sets and Decision Algorithms, in: W. Ziarko, Y. Y. Yao (eds.), Second International Conference, Rough Sets and Current Trends in Computing, RSCTC 2000, Banff, Canada, October 2000, LNAI 2000, 30-45
14. E. W. Adams: The Logic of Conditionals, an Application of Probability to Deductive Logic. D. Reidel Publishing Company, Dordrecht, Boston, 1975
15. T. Bayes: An essay toward solving a problem in the doctrine of chances, Phil. Trans. Roy. Soc., 53, 370-418; (1763); Reprint Biometrika 45, 296-315, 1958
16. J. M. Bernardo, A. F. M. Smith: Bayesian Theory, Wiley Series in Probability and Mathematical Statistics, John Wiley & Sons, Chichester, New York, Brisbane, Toronto, Singapore, 1994.
17. Chilin Shih, Greg Kochanski, "Bayes' Theorem", September 15, 2006.

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