ARTIFICIAL INTELLIGENCE

LAB ASSIGNMENT – 13

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Q) Explain Bayesian model for decision making.

Bayesian decision theory is a fundamental statistical approach to the problem of pattern classification. It is considered as the idea pattern classifier and often used as the benchmark for other algorithms because its decision rule automatically minimizes its loss function.

It involves basing decisions on the probability of a successful outcome, where this probability is informed by both prior information and new evidence the decision maker obtains.

Example:

Based on Bayesian model find the joint probability p(J,M,A,E,B)?

Given p(B)=0.001

P(E)=0.002

P(A|B,E)=0.95

P(A|B,~E)=0.94

P(A|~B,E)=0.29

P(A|~B,~E)=0.001

P(J|A)=0.90

P(J|~A)=0.05

P(M|A)=0.70

P(M|~A)=0.01

Here B,E are independent nodes(evidence)

A,J,M are hypothesis nodes

According to joint probability using Bayesian model

Hence

$P(J,M,A,E,B)=P(B)*P(E)*P(A|B,E)*P(M|A)*P(J|A)$

$=0.001*0.002*0.95*0.70*0.90$

$=0.000001197$