(Da) If with a replan unitable representing the agains of K a J & i) a random variable representing the negotion of V, then X to also interferdent of E and Y is integendent of w, So we have (x=0) L(Y=0), (x=0) L(Y=1), (x=1) L (Y=0) and if (x=0) 1 (4=0) then (x!=0) 1 (1!=0) 40 all 4 possibilities are insependent, therefore XIY b) For non binary variables there are multiple possibilities in the negation, so (x-0) I (y=0) loss not imply (x!=0) I (Y!=0) because there is more than one posibility for X != 0 and Y != 0 (1) X, is conditionally independent of Xz given Xz in a distribution PiF & satisfies (X=X LY=y / Z= 2) for all ulles x EVal(x), xgE Val(Xg), and xgEVal(Xg). The integralence statement is universal for all values of X, X2, and X3. Since (X, 1X21X3) we have P(X,1X2,X3)=P(X,), +hus P(X, 1X2 | X3) = P(X, 1X3) P(X2 | X3) If we let ky take on all possible in hes we have P(X, N X, 1X3) = 0,(X, X3) 02 (X2, X3) Leffang X, and X2 tree oil volve we can write P(X) = 0, (K, X3) 0, (K2, X3) 3) Variance is the expectation of the square difference before X and its expected unles: Var(x)=E((x-E(x))) 50 Var(x) = E[x2 - 2XE(x]+(E(x))2) Now Var (x): E[x") - E[2xE(x]) + E[(E(x))") Since EDD is just a number it can be factored out so Var(x)=E[x2]-ZE(x]E(x)+(E(x))2 = E(x) - (E(x))2

