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CSC384 A4: QUESTION #3

Example #1: Separable, but not Sufficient

A = Gender

C= BMI

Y = Hyperlipidemia

What to show:

(i) P(C|Y,A) = P(C|Y)

(ii) P(Y|C,A) != P(Y|C)

Gender (A)	BMI (C)	Hyperlipidemia (Y)	P(A,C,Y)
MALE	<18.5	NO	0.00766
MALE	<18.5	YES	0.000852
FEMALE	<18.5	NO	0.00784
FEMALE	<18.5	YES	0.000640
MALE	~18.5	NO	0.145
MALE	~18.5	YES	0.0459
FEMALE	~18.5	NO	0.148
FEMALE	~18.5	YES	0.0345
MALE	~24.0	NO	0.1066
MALE	~24.0	YES	0.1086
FEMALE	~24.0	NO	0.1092
FEMALE	~24.0	YES	0.0816
MALE	~28.0	NO	0.0351
MALE	~28.0	YES	0.0759
FEMALE	~28.0	NO	0.03596
FEMALE	~28.0	YES	0.0570

Example #2: Sufficient, but not Separable

A = Gender

C = Hyperlipidemia

Y = Diabetes

What to show:

(i) P(Y|C,A) = P(Y|C)

(ii) P(C|Y,A) != P(C|Y)

Gender (A)	Diabetes (Y)	Hyperlipidemia (C)	P(A,C,Y)
Female	NO	NO	0.185
Male	NO	NO	0.181
Female	YES	NO	0.116
Male	YES	NO	0.113
Female	NO	YES	0.062
Male	NO	YES	0.082
Female	YES	YES	0.112
Male	YES	YES	0.149