EXERCISE 4

The Mutual Fund manager manages a pool of investments made on behalf of people who share similar objectives. The manager makes the decision to buy and sell individual stocks and bonds in accordance with specific investment philosophy.

Why are some mutual fund managers more successful than others? One possible factor is the university, where the manager earned their Master of Business Administration (MBA).

Suppose that a potential investor examined the relationship between how well the mutual fund performance and where the fund manager earned their NBA.

After the analysis, a table of joint probabilities was developed.

	MUTUAL FUND OUTPERFORMS MARKET	MUTUAL FUND DOES NOT OUTPERFORM MARKET
Top-20 MBA program	.11	.29
Not top-20 MBA program	.06	.54

1) What is the probability that the mutual fund outperforms the market, and its manager did not graduate from a top 20 MBA programme?
2) What is the probability that a mutual fund does not outperform the market and its manager graduated from a top 20 MBA programme?
3) Calculate the marginal probabilities.
4) What is the probability that mutual fund managers did not graduate from a top 20 MBA programme?
5) Suppose now that we select one mutual fund at random and discover that it did not outperform the market. What is the probability that a graduate of a top 20 MB a programmer manages it?
6) Determine whether the event that the manager graduated from a top 20 MBA programme and the event they found outperformed the market are independent events.

A = MBA PROGRAM
- A_1 TOP_20
- A_2 NON TOP_20

B = MUTUAL FUND
- B_1 MF OUTPERFORMS
- B_2 MF DOES NOT OUTPERFORMS MARKET

JOINT PROB.

		OUTPERF B_1	NOT OUTPERF B_2	
TOP 20	A_1	0.11	0.29	0.4
NON TOP 20	A_2	0.06	0.54	0.6
		0.17	0.83	1

MARGINAL PROB.

MARG. PROB

$P(B=B_1)$

1) $P(A_2 \cap B_1) = 0.06 = 6\%$

2) $P(A_1 \cap B_2) = 0.29$

3) $P(A_1) = 0.11 + 0.29 = 0.4$

$= P(A_1 \cap B_1) + P(A_1 \cap B_2)$

4) $P(A_2) = 0.6$

5) CONDITIONAL PROB.

$$Pr(A_1 | B_2) = \frac{P(A_1 \cap B_2)}{P(B_2)}$$ = JOINT PROB / = MARG PROB

$$= \frac{0.29}{0.83} = 0.349$$

6) $Pr(A_1 | B_1) = P(A_1)$ → THIS IS TRUE IF EVENTS ARE INDEPENDENT

$$P(A_1 | B_1) = \frac{P(A_1 \cap B_1)}{P(B_1)} = 0.64$$

$$P(A_1) = 0.4$$

$\neq$