COMP111 - Exercise 6 Answers

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November 19, 2020

1. (a) This statement is false as not all of the statements are subsets of p_3:

p_1	p_2	p_3	$(p_1 \Rightarrow p_2)$	$(p_2 \Rightarrow p_3)$
0	0	0	1	1
0	0	1	1	1
0	1	0	1	0
0	1	1	1	1
1	0	0	0	1
1	0	1	0	1
1	1	0	1	0
1	1	1	1	1

3. (d) $S = \{HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT, THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT\}$ where $P(x) = \frac{1}{16}$ for all $x \in S$.
   $P(T \geq 3|S')$ where $S' = \{HTHH, HTHT, HTTH, HTTT, THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT\}$
   Therefore the probability is $\frac{\frac{5}{16}}{\frac{12}{16}} = \frac{5}{12}$

   (e) No, as there are only four coins, two of which are high. In order for three coins to come up tails then at least one must be a low coin. Therefore if you know that three coins are tails you can conclude that at least one value coin was chosen proving that they are not independent.