Probability Exercise Lecture 2 I

1. $P(Sat) = 0.25$, $P(Sun) = 0.25$

$$P(Sat \cup Sun) = P(Sat) + P(Sun) - P(Sat \cap Sun)$$
$$= P(Sat) + P(Sun) - P(Sat) \times P(Sun)$$
$$= \frac{1}{4} + \frac{1}{4} - \frac{1}{4} \times \frac{1}{4} = \frac{7}{16} < 0.5$$

2. (i) $\frac{5}{11} > \frac{3}{7}$, choose black

(ii) $\frac{6}{9} > \frac{9}{14}$, choose black

(iii) $\frac{11}{11+9} < \frac{12}{21}$, choose white

Simpson's paradox

5 10 10 5 1

$$\underbrace{\binom{5}{1} + \binom{5}{2} + \binom{5}{3} + \binom{5}{4} + \binom{5}{5}}_{+\binom{5}{0}} = 2^5 - 1 = 31$$