Assignment 1

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1) Two cards are drawn at random and without replacement from a pack of 52 playing cards. Find the probability that both the cards are black.
Solution: Consider the random variables X, Y as described in the table 1.

RV	Values	Description
X	$\{0, 1\}$	1st draw - 0: black card, 1: red card
Y	$\{0, 1\}$	2nd draw - 0: black card, 1: red card
X, Y	$\{00\}$	2 cards drawn are black

TABLE 1: Random variables X,Y

Given that the cards are drawn without replacement. Thus, the required probability is given by

$$\Pr(00) = \frac{{}^{26}C_2}{{}^{52}C_2} \tag{0.0.1}$$

$$= \frac{25}{102} \tag{0.0.2}$$