

# Assignment 1

STAT 230  
UAEU

There are a total of 7 problems. You may review Unit1 and Unit2 slides while answering the questions. Show your steps to get entire credit for your solutions.

1. Suppose that there is a practice session for a UAE football (soccer) team. In that session all the 11 players randomly picked up a jersey from a basket where exactly 11 jerseys were kept. Note that, all the jerseys have the players name written on it, therefore in the basket there were exactly one jersey that would match with a specific player. What is the probability that none of the players have picked up the jersey that would match their name?

2. Three cards are selected randomly **without replacement** from the deck of 52 cards.
- (a) What is the probability that all the cards are 'Spades' (♠)?
  - (b) What is the probability that at least one of them is an 'Ace'?

3. (10 points ) A car repair can be performed either on time or late and either satisfactorily or unsatisfactorily. The probability of a repair being on time and satisfactory is 0.26. The probability of a repair being on time is 0.74. The probability of a repair being satisfactory is 0.41. What is the probability of a repair being late and unsatisfactory?

4. A typical ATM pin consists of 4 digits. Assume that all the integers between 0 to 9 are equally likely for selecting each of the digits. Find the probability of the following events.
- (a) What is the number of all possible different ATM passwords that a user can choose?
  - (b) The bank has selected a group of 150 ATM users randomly. What is the probability that atleast two of the users have exact same ATM pin? Assume that all the possible four digit numbers are equally likely to be considered as a PIN of a randomly selected user. Also, compute the probability upto 3 decimal places.

Consider 8 tosses of a coin. For example two typical sequences of outcomes that are considered different is 'HTHTTTTT', and 'HHTTTTTT'.

5. (a) (5 points ) What is the total number of different outcomes from the experiment?  
(b) (5 points ) How many different ways there can be exactly 3 heads?

(10 points ) An investor has 30 thousand AED to invest among 3 possible investments. Each investment must be in units of a thousand AED. If the total 30 thousand AED is to be invested, how many different investment strategies are possible?

7. If a dice is thrown 8 times and all the the 8 numbers (8-tuple) that appear are recorded. Note that there is a total of  $6^8 = 1679616$  of distinct possibilities for the ordered sequences of 8 numbers (distinct 8-tuples) that can occur.  
(a) (5 points ) In how many such 8-tuples, there is exactly three 6?  
(b) (5 points ) In how many such 8-tuples, there is exactly three 6 and exactly two 1 ?