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Report (Exercise 2)

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1. P(A) = 0.3 , P(B) = 0.7
    a. The answer for Q 1.a, is no its not possible to find the P(A and B), becouse the relationship between events A and B not given. The formula that can help us is P(A and B) = P(A) * P(B|A), where P(B|A) is the conditional probability of event B given that event A has occurred.
    b. If events A and B are independent, then we can use the formula:
        i. P(A and B) = P(A) * P(B) and that give us P(A and B) = 0.21
            1. That mean the probability to happen A and B is 21%
        ii. P(A or B)?
            1. Formula for calc P(A or B) = p(A) + p(B) -p(A and B)
            The p(A) , p(B) is given and p(A and B) is given also from the answer of the Q1.b. so now if we do a quick calc on a calculator, we get that p(A or B) = 0.79 (79%)
        iii. P(A|B)?
            1. P(A|B) = P(A and B) / P(B), P(A and B) = 0.21 and P(B) = 0.7
            So the answer is P(A|B) = 0.3
2. For the Q.2 we well calc the mean and standard deviation.
    a. i) mean = (1+7+7+7+9+12+12+1+14)/9 = 7.78
        i. standard deviation = $s=\sqrt{(\sum(x_i-\bar{x})/n-1)}$, efter using the calculator sa we get that standard devitation is s = 4.60
    b. ii) mean = (1+7+7+7+9+12+12+12+21)/9 = 9.78
        i. standard devitation = we use the same formula and we get that s = 5. 54
    c. i) mean = (-10+ 0+0+ 0+17+27+ 40+40)/8 = 14.25
        i. standard devitation = 19.62
    d. i) mean = (-30+ 0+0+ 0+17+27+ 40+40)/8 = 11.75
        i. standard devitation = 23.94
3. for the Q3 we can use the Shapiro-wilk test statistic to know if the distributed is normally!

    The formula for shapiro wilk test

$$W = \frac{\left\{\sum_{i-1}^{n} a_i \left(x_{(n-i+1):n} - x_{i:n}\right)\right\}^2}{\sum_{i=1}^{n} (x_i - \bar{x})_2},$$

And after we calc the shapiro wilk test using tha apove formula, sa we get that the probability value is p(0.107) and we can se that the probability is greater than 0.05, because of that the data we have is normality disstributed.