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Homework Assignment 1
EECE-8219, Fall 2021

2021-02-22

Q1. Given that the correlation coefficient measures the degree to which two things vary together or oppositely, how do we interpret it?

Ans: The absolute values of the correlation coefficient of two variables represents the strength of their linear relationship. For example in pearson coefficient, values close to 0 and 1 signifies weak and strong linear relations between two variables respectively. The sign of coefficient represent the direction of their linear relationship. Positive (+) sign indicates when the value of one variable increases, the value of the other variable also tends to increase. Negative (-) coefficients represent cases when the value of one variable increases, the value of the other variable tends to decrease.

Q2. What is the meaning of zero or near zero correlation?

Ans: Zero or near zero correlation indicates absent or weak linear relationship between two variables.

Q3. When we perceive two things that co-vary, what do we see?

Ans: When two things co-vary, it usually means that there is some linear relationship between them. Specifically, it indicates that change in one variable causes changes in the other variable and the nature of this change is linear.

Q4. When two variables are uncorrelated?

Ans: Two variables are uncorrelated when there is no linear relationship between them. It means that one variable does not have a linear effect on the the other variable. In statistics, when the pearson coefficient between two variables is zero it signifies they are uncorrelated.

Q5. When two variables are statistically independent?

Ans: Two variables A and B are statistically independent if, $P(A \cap B) = P(A).P(B)$. It means that the events associated with these variables does not occur together or have no effect on each other.