University of Ferhat Abbas- Setif -1
Faculty of economics, Commerce and Management sciences
Department of Accounting & Finance
Second - year Accounting **Practice Problems- Series 01-** **Statistics 03**

Exercise 01:

The following data were collected by counting the number of operating rooms in use at General Hospital over a 20-day period. On three of the days only one operating room was used, on five of the days two were used, on eight of the days three were used, and on four days all 4 of the operating rooms were used.

1. Use the relative frequency approach to develop a discrete probability distribution for the number of operating rooms in use on any given day.
2. Draw a graph of the probability distribution.
3. Determine whether this probability distribution is a valid discrete probability distribution?

Exercise 02:

Consider the following probability distribution of a discrete random variable

x	-2	1	2	4
P(Xi)	1/4	1/8	1/2	1/8

1. Is this a valid discrete probability distribution?
2. Draw a graph of the probability distribution?
3. Calculate the cumulative probability distribution function $F(x)$, then draw a graph of it.
4. Find the following: $E(x)$,m_2, $V(x)$, and $\delta(x)$?
5. What is the probability of: $p(x \geq 1), p\ (x = 3), p(x > 1), p(-2 \leq x < 4)$?
6. Let z a random variable equals Z = 7x -4. Calculate the $E(z)$, $V(z)$?

Exercise03: A person is interested in constructing a portfolio. Two stocks are being considered. Let x= % return for an investment in stock 1, and y = % return for investment in stock 2. The expected return and variance for stock 1 are $E(x) = 8{,}45\%\ and\ Var(x) = 25$. The expected return and variance for stock 2 are $E(y) = 3.2\%\ and\ Var(y) = 1$. The covariance between the two return is $\sigma_{xy} = -3$.

a. What is the standard deviation in stock 1 and stock2 ? using the standard deviation as measure of risk, which stock is the riskier investment?
b. What is the expected return and standard deviation in DZD, for a person who invests DZD 800 in stock 1?
c. What is the expected percent return and standard deviation for a person who constructs a portfolio by investing 50% in each stock?
d. What is the expected percent return and standard deviation for a person who constructs his portfolio by investing 65% in stock 1 and 35% in stock 2?
e. Compute the correlation coefficient for x and y, and comment on the relationship between the returns for the two stocks?

Exercise 04:

Let us assume you are a financial advisor, and you are trying to develop a portfolio for a customer, the following data were provided to you.

(x) = represents the percentage return of stock fund.

(y) = represents the percentage return of long-term Government fund.

probability (x,y)	stock fund (x)	Long-term Government Bond fund (y)
0.12	-38	28
0.22	4	4
0.51	17	5
0.15	29	2.5

a. Compute: $E(x), Var(x), \sigma(x), E(y), Var(y), \sigma(y)$.
b. What is the probability of: $P(x) < 4), P(x \geq 17), P(y = 2.5)$.
c. Develop a bivariate probability distribution for portfolio (x+y), then find E(x+y), Var(x+y), $\sigma(x + y)$
d. Compute the covariance, the expected return and the risk (σ) of the portfolio, assuming the customer wants to invest 60% of his fund in stocks and 40% in bonds.