Problem Statement 1: Employee Performance Analysis Suppose a company wants to understand the impact of **gender (Male, Female)** and **department (HR, Sales, Marketing)** on the **performance score** of employees. The performance score ranges from 1 to 10.

Gender	Department	Performance_Score
Male	HR	7
Female	HR	8
Male	Sales	6
Female	Sales	7
Male	Marketing	8
Female	Marketing	9

Problem Statement 2: Crop Yield Experiment A farmer wants to test the effect of **fertilizer type (Organic, Chemical)** and **irrigation method (Drip, Sprinkler)** on the **yield of a crop** (in kg per square meter).

Fertilizer_Type	Irrigation_Method	Crop_Yield
Organic	Drip	20
Chemical	Drip	22
Organic	Sprinkler	18
Chemical	Sprinkler	21

Problem Statement 3: Software Performance Testing A software company wants to understand the effect of **operating system (Windows, Linux)** and **type of processor (i5, i7)** on the **execution time** of a software (in milliseconds). A random sample data could be:

Operating_System	Processor	Execution_Time
Windows	i5	120
Linux	i5	115
Windows	i7	100
Linux	i7	95

In each of these problem statements, the two independent variables are categorical, and the dependent variable is continuous. Two-way ANOVA can be used to understand if there is a significant effect of the independent variables on the dependent variable, and if there is an interaction effect between the independent variables.