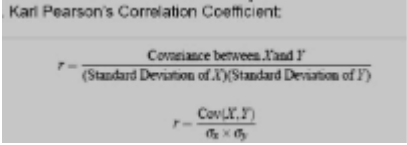


GE II Sem
GE 2b: Data Analysis and Visualization using Spreadsheet
(Admission 2022 onwards)

Unit/Week	Description	Ref	Chapter	Pg/Link
Unit 1 - Introduction to Basic Statistics (Week 1-3)	Fundamentals of Data Analysis, Statistical foundations for Data Analysis, Types of data, Descriptive Statistics, Correlation and covariance, Linear Regression.	[1]	4,5,7,8	BS-1.4 - BS-1.7 (Statistics Defined, Functions of Statistics) BS-1.21 - BS-1.22 (Primary & Secondary Data and Sources, Method of Collecting Primary Data[only headings]) BS-4.2- 4.6(Objective of Averaging, Requisites of a Good Average, Types of Averages, Arithmetic Mean for Individual Observations, Arithmetic Mean for Discrete Series) BS-4.12 (Merits and Limitations of Arithmetic Mean) BS-4.16 -BS-4.17 (Median, Calculation of MEDian - Individual Observations, Computation of Median - Discrete Series) BS-4.22-BS-4.25 (Merits and Limitations of Median, Computation of Quatiles, Deciles, percentile etc) BS-4.28 - BS 4.31 (Mode, Calculation of Mode, Calculation of Mode - Indivial Observations, Computation of Mode - Discrete Series) BS -4.35 (Merits and Demerits of Mode) BS-5.1- BS-5.4 (Introduction, Objectives of Measuring Variations, Properties of a Good Measure of variation, Methods of studying variations) BS-5.4- BS-5.8 (Absolute Measure, Range, Interquartile range and quartile deviation) {Exclude Relative Measures in all these topics} BS-5.13-BS-5.14 (The Standard Deviation {Only Deviations taken from Actual Mean}) BS-5.15 (Calculation of Standard Deviation - Discrete Series {Only By Actual Mean method}) BS-5.20-BS-5.21 (Coefficient of Variation) BS-5.23-BS-5.25 (Variance {Excluding Assumed mean}, Merits and Limitations of Standard Deviation) BS-7.1 (Meaning) BS-7.3-BS-7.7 (Types of Correlation {Only Positive and Negative}, Scatter Diagram Method)

				BS-7.9-BS-7.10 (Karl Pearson's Coefficient of Correlation) BS-8.1-BS-8.5 (Regression Analysis, Difference between Correlation and Regression Analysis, Regression Lines, Regression Equations) <div style="text-align: center; margin: 10px 0;">  </div> Covariance Formula:
Unit 2 - Data Handling (Week 4-8)	Spreadsheet Concepts	[3]	1	1,3-13,19-21
	Managing Worksheets	[3]	2	Complete
	Formatting Cells	[3]	4	89-132 (excluding Using the Mini-Toolbars and the Context Menu)
	Entering Data	[3]	3	49-62,73-75 (including Teaching Excel to Create an AutoFill Pattern), 134-143
	Handling Operators in formula, Cell Referencing, Naming of Cells, Cell Ranges, Formula vs Functions	[3]	7	Complete
	Data Validation	[3]	9	304-318
	Find & Replace			https://support.microsoft.com/en-us/office/find-or-replace-text-and-numbers-on-a-worksheet-0e304ca5-ecef-4808-b90f-fdb42f892e90?ns=excel&version=19&ui=en-us&rs=en-us&ad=us
	Paste Special	[3]	11	373-384,390-395 (excluding Using Paste Special to Perform Calculations), 400-404 (excluding Using the Microsoft Office Clipboard)
	Formatting as table, Filter and advanced Filter, Sorting, Multilayer sorting	[3]	12	411-422 (excluding Filtering Data with a Slicer) https://support.microsoft.com/en-us/office/filter-by-using-advanced-criteria-4c9222fe-8529-4cd7-a898-3f16abdf32b?ns=excel&version=19&ui=en-us&rs=en-us&ad=us#bkmk_0 (Advanced Filters) https://support.microsoft.com/en-us/office/sort-data-in-a-table-77b781bf-5074-41b0-897a-dc37d4515f27?ns=excel&version=19&ui=en-us&rs=en-us&ad=us (Sorting and Multi-level sorting)
Pivot Table	[3]	15	541-554	

	Cell Formulae vs Array Formulae			https://support.microsoft.com/en-us/office/create-an-array-formula-e43e12e0-afc6-4a12-bc7f-48361075954d?ns=excel&version=19&ui=en-us&rs=en-us&ad=us
	Mathematical functions, Statistical functions, Logical functions, Date and Time functions, Lookup and reference: Hlookup, and Vlookup, Index and Match functions, Text functions.	[3]	8	Complete https://support.microsoft.com/en-us/office/look-up-values-in-a-list-of-data-c249efc5-5847-4329-bfee-ecffead5ef88?ns=excel&version=19&ui=en-us&rs=en-us&ad=us https://support.microsoft.com/en-us/office/find-findb-functions-c7912941-af2a-4bdf-a553-d0d89b0a0628 https://support.microsoft.com/en-us/office/statistical-functions-reference-624dac86-a375-4435-bc25-76d659719ffd?ns=excel&version=19&ui=en-us&rs=en-us&ad=us (Max, Min, Median, Mode, MaxIfs, MinIfs, Frequency, Average, Correl, Count, CountA, CountIf, CountIfs)
	What-if-analysis: Goal-seek, Data tables, Scenario manager.			https://support.microsoft.com/en-us/office/introduction-to-what-if-analysis-22bffa5f-e891-4acc-bf7a-e4645c446fb4?ns=excel&version=19&ui=en-us&rs=en-us&ad=us (Except Prepare forecast and advanced business models) https://support.microsoft.com/en-us/office/switch-between-various-sets-of-values-by-using-scenarios-2068afb1-ecdf-4956-9822-19ec479f55a2 (Creating Scenarios only)
Unit 3 - Data Analysis (Week 9-12)	Explore a data model: its content, and its structure, using the Power Pivot add-in. Learning DAX formula language. Create calculated fields and calculated measure for each cell, filter context for calculation, and explore several	[6]		2-4, 7, 10-12, 14-16, 184-186, 25-26, 50 onwards(all function list)

	advanced DAX functions. Cube formulas to retrieve data from data model.			
Unit 4 - Data Visualization (Week 12-15)	Pivot Charts	[3]	15	569-575
	Different types of charts Column, Line, Pie, Bar, Scatter charts. Fine tuning of charts: Chart Elements, Chart Styles, Chart Filters, Box Plot.			https://support.microsoft.com/en-us/office/available-chart-types-in-office-a6187218-807e-4103-9e0a-27cdb19afb90?ns=excel&version=19&ui=en-us&rs=en-us&ad=us <u>(Column,Line,Pie,Scatter)</u>
				https://support.microsoft.com/en-us/office/change-the-layout-or-style-of-a-chart-a346e438-d22a-4540-aa87-bce9feb719cf?ns=excel&version=19&ui=en-us&rs=en-us&ad=us
				https://support.microsoft.com/en-us/office/change-the-shape-fill-outline-or-effects-of-chart-elements-edbc9ae5-12ef-46d0-b078-67f450a35cb9?ns=excel&version=19&ui=en-us&rs=en-us&ad=us
				https://support.microsoft.com/en-us/office/change-the-shape-fill-outline-or-effects-of-chart-elements-edbc9ae5-12ef-46d0-b078-67f450a35cb9?ns=excel&version=19&ui=en-us&rs=en-us&ad=us
			https://support.microsoft.com/en-us/office/change-the-data-series-in-a-chart-30b55a30-1c2e-42d5-8ed1-3cc3ffb68036?ns=excel&version=19&ui=en-us&rs=en-us&ad=us	

References:

- [1] Gupta, S.P., Elementary Statistical Methods, Sultan Chand and Sons, New Delhi, 2017.
- [2] Goldmeier, J., Advanced Excel Essentials, Apress, 2014.
- [3] Slager, D., Essential Excel 2016: A Step-by-Step Guide, Apress, 2016.
- [4] Valerie M. Sue and Matthew T. Griffin, Data Visualization and Presentation with Microsoft Office, SAGE, 2016.
- [5] "Schmuller, J., Statistical Analysis with Excel for Dummies, 4th edition., Wiley India Pvt Ltd., 2020."
- [6] Data Analysis Expressions (DAX) Reference - <https://learn.microsoft.com/en-us/dax/>

Suggested Practical List

1. In a meeting of a marketing department of an organization it has been decided that price of selling an item is fixed at Rs. 40. It was resolved to increase the selling of more items and getting the profit of Rs. 50000/-. Use Goal Seek to find out how many items you will have to sell to meet your profit figure.
2. Create worksheet related to crop production of various crops in Indian states in last five years (wheat, rice, pulses, soya-bean, and cane-sugar etc).
 - i) Make a bar chart
 - ii) Make a pie chart
 - iii) Make a box plot
3. Study and perform the various DAX functions to analyse the data.
4. Create workbook related to sales of Business Company having various products in last four quarters for 10 sales persons.
 - i) Make a line graph to show the growth/decline in the sales
 - ii) Show the graph of each sales person's sales
 - iii) Find the two sales persons done in last 2 quarters
 - iv) Find the sales persons consistent in last four quarters
 - v) Find the most popular product of the company and the current popular product of company.
5. Create a Pivot-table showing the Customer Names who placed orders with GSS during 2019-2022. For each customer, also show the total number of orders, Total Sales, and Total Profit. Add a Slicer or a Filter that can be used to show the information specifically for each Customer Segment. Use information from the Pivot-table to answer the following questions (Hint: Filter and sort the data in the Pivot-table to locate the answer):
 - i) Which small business customer had the highest sales?
 - ii) Which corporate customer placed the greatest number of orders in 2019-2022? How many orders were placed by the corporate customer?
 - iii) Which consumer customer was the most profitable one?
 - iv) What is the sales figure of the least profitable home office customer?

6. Consider the following worksheet: (enter 5 records)

FULL NAME	GRADE 1/2/3	BASIC SALARY	HRA	PF	GROSS	NET	VA	VA>HRA

HRA is calculated as follows:

Grade	HRA (% of basic)
1	40%
2	35%
3	30%

PF is 8% for all grades

VA is 15000, 10000, 7000 for Grades 1, 2 and 3.

Gross=Basic + HRA+VA

Net=Gross - PF

- i) Find max, min and average salary of employees in respective Grade.
- ii) Count no. of people where VA>HRA
- iii) Find out most frequently occurring grade.
- iv) Extract records where employee name starts with “A” has HRA>10000
- v) Print Grade wise report of all employees with subtotals of net salary and also grand totals.
- vi) Use subtotal command.
- vii) Extract records where Grade is 1 or 2 and salary is between 10000 and 20000 both inclusive.

7. Create workbook related to sales of Business Company having various product in last ten quarters for 20 sales persons. Perform the following on workbook:

- i) Create and modify a Pivot-table
- ii) Apply Pivot-table styles and formatting
- iii) Filter a Pivot-table
- iv) Insert a slicer to filter a Pivot-table
- v) Create a Pivot Chart

8. Create a PivotTable showing Total Sales breakdown by Region, Product Category, and Product Sub-Category. Use information from the PivotTable to answer the following questions:
- What was the Total Sales figure included in this data set?
 - Which Product Category had the highest sales?
 - Which Region had the lowest sales?
 - What was the Total Sales of Appliances in Delhi?
9. You are required to prepare a payroll statement in the given format making maximum use of cell referencing facility:

Code	Name	Category	Is HRA to be Paid	Basic	DP	DA	HRA	TA	CCA	Gross
1			Y							
2			N							
	Total									

Required:

- Basic salary (Allow any Basic salary in the range of Rs.10000-35000)
- DP is 50% of Basic Salary.
- DA (as a Percentage of Basic + DP) is more than 35000 then 40% of basic else 30% of basic.
- HRA is to be paid @ 40% of (Basic plus DP) to those whom HRA payable is yes.
- TA is to be paid @ Rs. 800 PM if Basic Salary is Less than Rs.12000, otherwise the TA is Rs. 1000 PM)
- CCA is to be paid @ Rs. 300 PM if Basic Salary is less than Rs.12000/- otherwise the CCA is Rs. 500 PM)
- Gross salary is the sum of Salary and all other allowances
- Deduction: a) GPF 10% of (Basic +DP) subject to a minimum of Rs.2000/- b) IT 10% of Gross Salary
- Net salary is Gross salary minus total deductions.

10. Consider the following worksheet for APS 1st year students:

S.No.	Name	Physics	Chem	Bio	Maths	CS	Total	%	Grade
1									
2									
3									
4									
5									

The value of Grade is calculated as follows:

If % ≥ 90 Grade A

If % ≥ 80 & < 90 Grade B

If % ≥ 70 & < 80 Grade C

If % ≥ 60 & < 70 Grade D

Otherwise, students will be declared fail.

- i) Calculate Grade using if function
- ii) Sort the data according to total marks
- iii) Apply filter to display the marks of the students having more than 65% marks.
- iv) Enter the S.No. of a student and find out the Grade of the student using VLOOKUP.
- v) Extract all records where name
 - a) Begins with "A"
 - b) Contains "A"
 - c) Ends with "A"