1.1 Word and Spreadsheet

(PSY206) Data Management and Analysis

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Overview

- In data analysis, we often deal with **large amounts of text, numbers, and tables**.
- Two essential tools to manage these are the **word processor** and the **spreadsheet**.
- These software packages are foundational:
  - Word processors help us **create, format, and edit documents**.
  - Spreadsheets help us **organize, calculate, and analyze numerical data**.
- Before moving on to statistical software (like `SPSS`, `Nvivo`, or `MAXQDA`), students must have a clear understanding of these fundamental tools.

Subsection 1

Word Processors

Word Processors

- A **word processor** is software used for creating, editing, formatting, and printing text-based documents.
- They replaced traditional typewriters by allowing:
  - Easy editing and revising of text.
  - Rich formatting options (fonts, margins, headings, alignment).
  - Insertion of **tables, figures, footnotes, references, hyperlinks**.
  - Spell-checking and grammar tools.
- Examples: **Microsoft Word, Google Docs, LibreOffice Writer, Apple Pages, WPS Writer, Overleaf (LaTeX editor)**.

Microsoft Word

- Part of the **Microsoft Office Suite**.
- **Features:**
  - Templates for reports, resumes, academic theses.
  - Advanced referencing tools (citations, bibliographies).
  - Track changes and comments for collaboration.
  - Mail merge for generating personalized letters.
- **Strengths:**
  - Professional, flexible, widely supported across industries.
- **Limitations:**
  - Paid software requiring license/subscription.

Microsoft Word

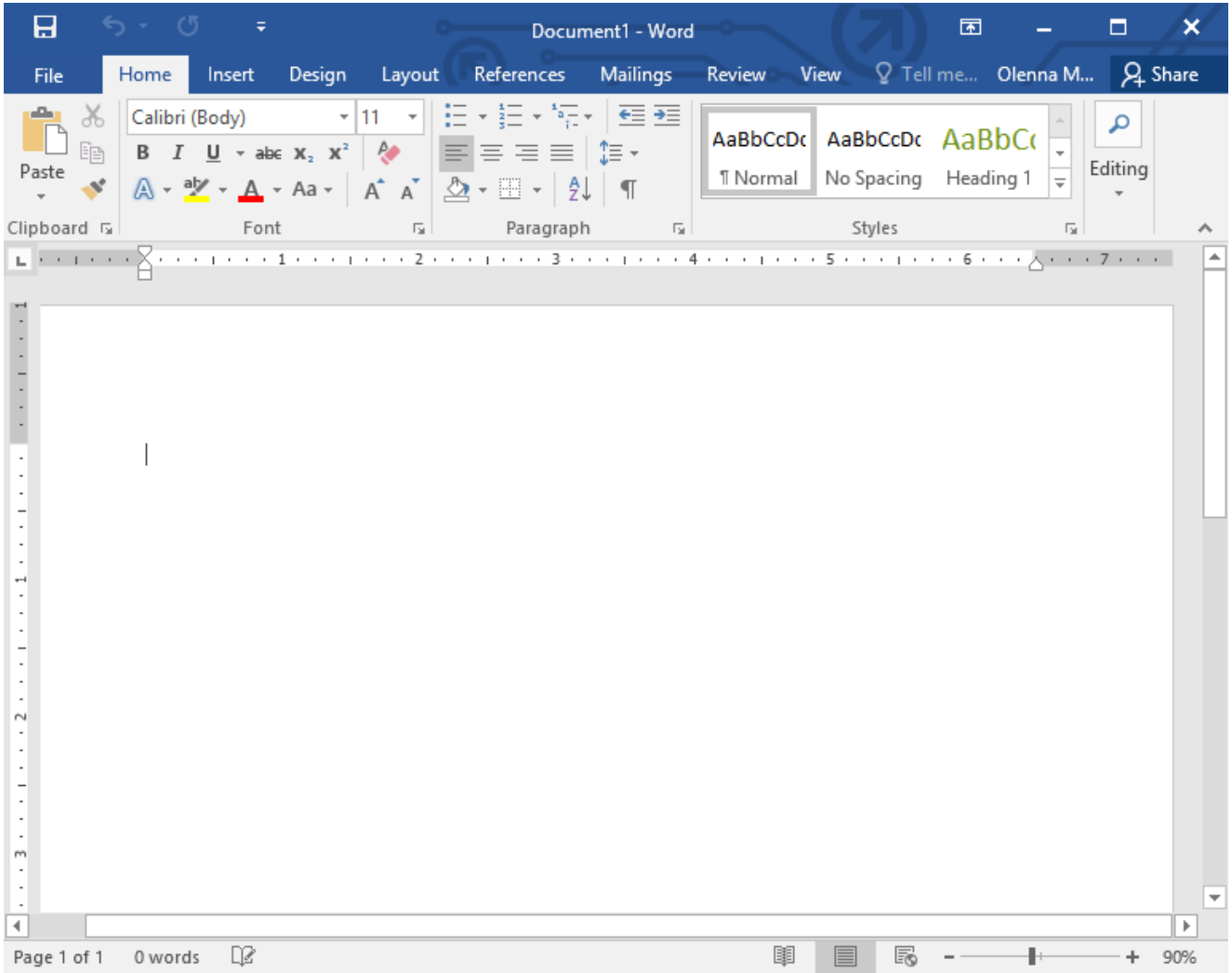

Figure 1: Microsoft Word Home Screen

Alternatives to Microsoft Word

1. **Google Docs** – Free, browser-based, real-time collaboration.
2. **LibreOffice Writer** – Free, offline, open-source, Word-compatible.
3. **WPS Writer** – Free version available, Excel-like interface.
4. **Overleaf (LaTeX editor)** – Best for academic research writing with formulas and structured formatting.

Subsection 2

Spreadsheets

Spreadsheets

- A **spreadsheet** is a software application designed to organize, calculate, and analyze data in tabular form.
- Data is entered into a **grid of rows and columns**, forming **cells**.
- Each cell can contain text, numbers, or formulas.
- Spreadsheets are particularly useful for:
  - **Numerical analysis** (budgets, statistical summaries).
  - **Data visualization** (charts and graphs).
  - **Data management** (sorting, filtering, and summarizing).
- Popular spreadsheets include **Microsoft Excel, Google Sheets, and LibreOffice Calc**.

Introduction to Excel

- Microsoft Excel is a **spreadsheet program** used to store, organize, and analyze data.
- Data is arranged in **rows (numbers)** and **columns (letters)** forming **cells**.
- Each cell can contain:
  - **Text** (names, labels)
  - **Numbers** (data values)
  - **Formulas** (calculations)

Introduction to Excel

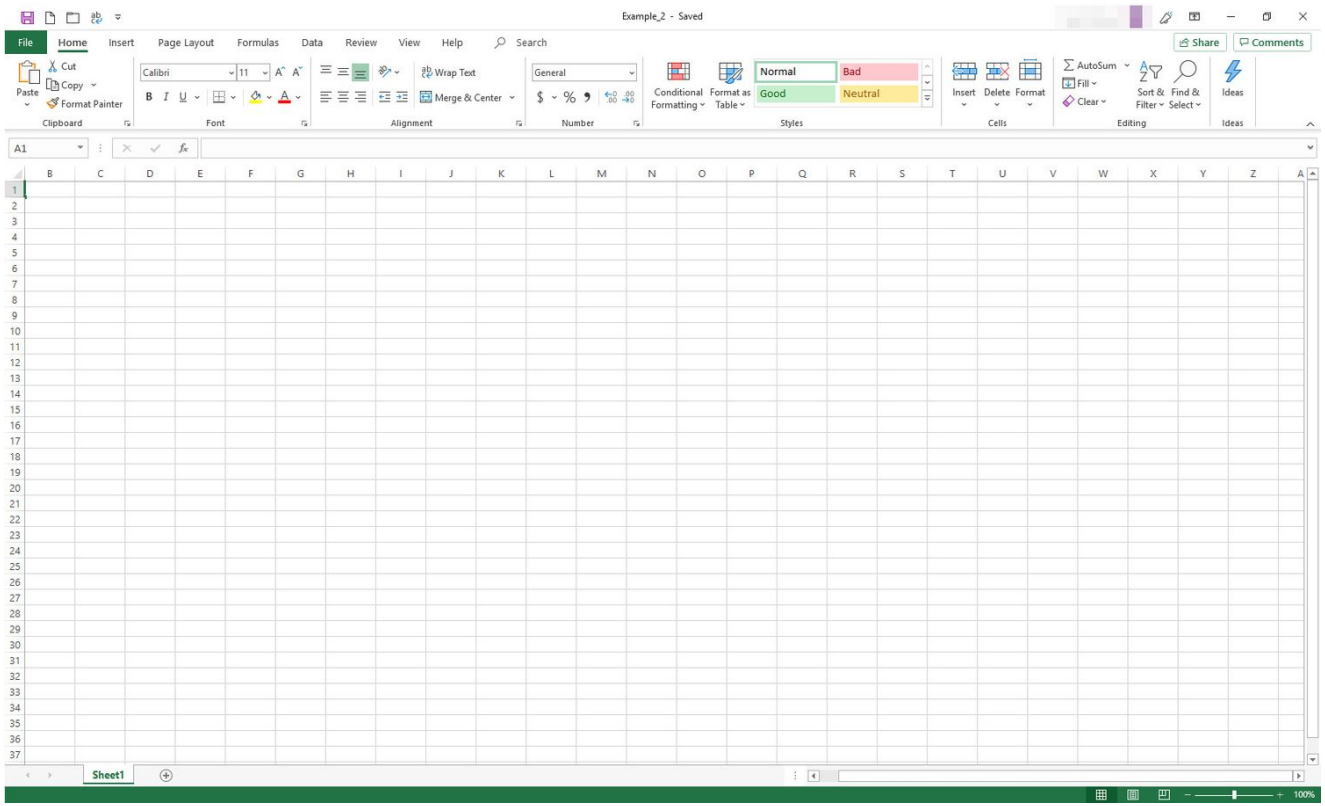

Figure 2: An Excel sheet

Excel Interface

- **Workbook** $\rightarrow$ The whole Excel file.
- **Worksheet** $\rightarrow$ A single tab/page inside a workbook.
- **Cell** $\rightarrow$ Intersection of a row and a column.
- **Cell Reference**:
  - `A1` = Column A, Row 1
  - `B5` = Column B, Row 5

Entering Data

- Click on a cell and type a value or text.
- Press **Enter** to go down, **Tab** to move right.
- Data types:
  - **Numeric**: 120, 3.75
  - **Text**: “Dhaka”, “Student”
  - **Date/Time**: 12/09/2025, 10:30 AM

Basic Formulas

- Always start with =.
- Examples:
  - `=A1 + B1` → Adds two cells.
  - `=A1 * B1` → Multiplies values.
  - `=A1 - B1` → Subtracts values.
  - `=A1 / B1` → Divides values.

Common Functions

- **SUM** $\rightarrow$ `=SUM(A1:A5)` adds all numbers from A1 to A5.
- **AVERAGE** $\rightarrow$ `=AVERAGE(B1:B10)` finds mean.
- **MAX / MIN** $\rightarrow$ `=MAX(C1:C20)`, `=MIN(C1:C20)` finds maximum and minimum.
- **COUNT** $\rightarrow$ `=COUNT(D1:D50)` counts numeric entries.

Formatting Data

- Change **font, size, and color**.
- Use **bold/italic/underline** for emphasis.
- Align text left, right, or center.
- Format numbers as:
  - Currency
  - Percentage
  - Date

Charts in Excel

- Select data $\rightarrow$ Insert $\rightarrow$ Choose chart type.
- Common charts:
  - **Column/Bar chart** – compare categories.
  - **Pie chart** – show proportions.
  - **Line chart** – show trends over time.

Example Exercise

- **Q1:** Enter 5 students' marks in Excel and calculate:
  - Total marks using `SUM()`.
  - Average marks using `AVERAGE()`.
  - Highest mark using `MAX()`.
- **Q2:** Create a bar chart of the marks.

Alternatives to Excel

1. **Google Sheets** – Free, online, real-time collaboration.
2. **LibreOffice Calc** – Free, offline, Excel-compatible.
3. **WPS Spreadsheets** – Free, Excel-like user interface.
4. **Zoho Sheet** – Cloud-based, business-oriented, integrates with Zoho apps.