

# Statistics and Data Analysis

## Unit 01 – Lecture 04: In-class Activity (Cleaning + Summary + Plots)

Tofik Ali

School of Computer Science, UPES Dehradun

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<https://github.com/tali7c/Statistics-and-Data-Analysis>

# Quick Links

Task

Deliverables

Solution

Wrap-up

# Agenda

- 1 Activity Brief
- 2 Deliverables
- 3 Solution and Discussion
- 4 Wrap-up

# What We Will Do Today

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- create 2–3 engineered features
- create summary tables
- create 3 plots and write short insights



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- 5 min: wrap-up + exit question

# Dataset

File: `data/campus_cafe_transactions.csv`

Columns:

- `date` (datetime), `category` (Snacks/Drinks/Stationery)
- `payment_mode` (Cash/UPI/Card)
- `units`, `unit_price`, `discount_pct`

**Note:** It intentionally includes missing values and invalid entries to clean.

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- Compute missingness % per column



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- Handle price outliers (replace with category median or cap; justify)

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Create:

- `gross_amount = units × unit_price`
- `net_amount = gross_amount × (1 - discount_pct/100)`
- `is_weekend` from date

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- total net revenue by `payment_mode`
- top 5 transactions by `net_amount`

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- bar chart: net revenue by category

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- bar chart: net revenue by category
- histogram: net amount per transaction
- line chart: daily net revenue

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- Three plots saved in `images/`
- 3–5 short insights + 2 limitations/caveats

# Solution Script (Python)

After attempting yourself, run:

```
python demo/activity_solution.py
```

Outputs:

- data/campus\_cafe\_clean.csv
- summary CSVs in data/
- plots in images/

## Expected Key Results (Example)

Net revenue by category (after cleaning):

Category	Count	Net Revenue (INR)
Snacks	9	1129.25
Drinks	8	368.00
Stationery	7	283.90

**Question:** Why is Snacks revenue much higher?

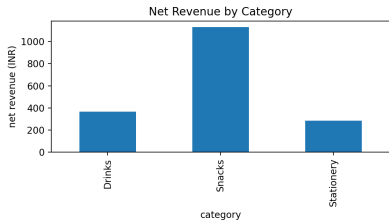
## Expected Key Results (Payment Mode)

Net revenue by payment mode (after cleaning):

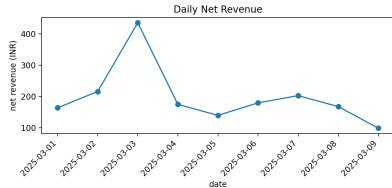
Mode	Count	Net Revenue (INR)
UPI	12	1124.15
Cash	6	304.00
Card	6	353.00

# Example Plots

## Revenue by Category



## Daily Revenue



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Examples of caveats:

- Small dataset (only a few days)  $\Rightarrow$  not representative.
- Cleaning choices (caps/median replacement) can change results.

# Wrap-up

- A good summary combines: cleaning + engineered features + tables + plots

**Exit question:** What is one cleaning rule you applied and why?

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- Document your rules so results are reproducible
- Always communicate limitations honestly

**Exit question:** What is one cleaning rule you applied and why?