Week 3 — Visual Types I: Table, Points & Lines

STA191 Fundamentals of Data Visualization · Topic 2 · Suriyati Ujang

Now we meet the charts themselves: the points family (pie, scatter) and the lines family (line chart, slopegraph, Gantt).

By the end of this week you can: use a pie chart correctly and know when a bar is better; read a scatterplot; build line charts and slopegraphs; plan a project with a Gantt chart.

Session 1 — Points: pie & scatter

3.1 The pie chart — useful, but easy to misuse

A pie shows parts of a whole. It works only when there are six or fewer slices, categories don't overlap, and you're not showing a trend. Always label each slice — colour alone fails colour-blind readers.

The eye is bad at comparing angles. The moment you want precise size comparison, a pie fights you — a bar chart wins because the eye compares aligned lengths easily. *Example:* student e-wallet share (Touch 'n Go 38%, GrabPay 27%, Boost 18%, ShopeePay 12%, others 5%) is hard to rank as a pie but obvious as a bar chart.

Watch out: never add 3D or shadow to a pie — it distorts slice sizes. More than six categories → use a bar chart.

3.2 The scatterplot — showing a relationship

One variable on the x-axis, another on the y-axis, one dot per observation. It answers: are these two things related, and how? The pattern can be positive, negative, none, or non-linear. *Example:* weekly revision hours vs CGPA — if the cloud rises left-to-right, that's a positive relationship (association, not proof of cause).

Session 2 — Lines, slopegraph & Gantt

3.3 The line chart — change over time

Lines imply continuity, so they're for continuous data over time (days, months, years) at even intervals. One line, or several to compare series. *Example:* monthly MRT ridership shows holiday dips and year-end climbs at a glance. Line charts do **not** need a zero baseline — their message is the shape of the trend. A shaded band can show a range or forecast.

3.4 The slopegraph — two points, clear change

With only two time points and several categories, a slopegraph beats a busy chart: two columns of dots joined by lines, so a rising or falling slope shows each category's change instantly. *Example:* e-wallet use in 2024 vs 2026 by age group — your eye jumps to the group that fell.

3.5 The Gantt chart — planning your project

A horizontal-bar timeline of a project: tasks down the side, time across the top, each bar showing start, duration and overlaps. This is the tool for your STA191 group project: choose topic → collect data → clean data → build charts → write report → rehearse presentation, across Weeks 5–14.

Key terms: pie chart (≤6 slices) · scatterplot · positive/negative relationship · line chart · slopegraph · Gantt chart

Review: (1) Rank eight vendors by exact share — which chart? (2) Monthly ridership over a year — which chart? (3) True/false: line charts must start at zero.

Glossary

- **Pie chart** — parts of a whole; use only for ≤6 labelled, non-overlapping categories with no trend.
- **Scatterplot** — one dot per observation on two axes; shows if and how two variables relate.
- **Positive / negative relationship** — dots rising (positive) or falling (negative) left-to-right.
- **Line chart** — connected points for continuous data over time; shows a trend.
- **Slopegraph** — two columns of points joined by lines; slope shows change.
- **Gantt chart** — a horizontal-bar project timeline (tasks vs time).