

Exercise: Mobile Data Usage Billing

Scenario

A telecommunications company charges customers for their mobile data usage. They have two plans:

- **Plan A:**
 - First 500 MB are free
 - After that, each MB costs 0.02 USD
- **Plan B:**
 - Flat rate of 20 USD per month gives 1000 MB
 - For any data beyond 1000 MB, they charge 0.015 USD per MB

A customer's monthly data usage (in MB) is known. The customer also has a promotional discount: if they use **more than 2000 MB**, they get a 5% discount on the *portion of data charges beyond 2000 MB*.

Task

- Define appropriate variables to represent:
 - `customer_data` (int or float) — total MB used in the month
 - `plan_type` (string) — either "A" or "B"
 - `cost` (float) — the total charge
 - `discount_eligible` (bool) — whether the usage is greater than 2000 MB
- Use arithmetic, assignment, comparison, and logical operators to compute cost based on the plan and the usage; also compute `discount_eligible`.
- Compute the final cost after applying the discount if eligible (only on the data portion beyond 2000 MB).
- Finally, store the final cost in a variable and also compute the over-usage beyond plan's free or included data in each plan.

Example Values to Work With

You can choose example values (hardcoded in variables):

- `customer_data = 2500`
- `plan_type = "B"`

What Students Must Do (Steps)

1. Set/assign the example values for variables (`customer_data`, `plan_type`).
2. Compute how many MB are chargeable (i.e. beyond free MB or included MB) using comparison and subtraction.
3. Compute base data cost with arithmetic for the extra MB.
4. Compute whether `discount_eligible` is True or False using comparison operator.
5. If discount eligible, compute the discounted amount on the part beyond 2000 MB (even though we're not using if-else in code here, they can simulate via boolean * arithmetic). (E.g. `discount = extra_data_beyond_2000 * rate * 0.05 * discount_eligible`)
6. Compute final cost by assigning base cost minus discount (if any).
7. Also compute `over_usage` (data beyond free/included quota) and perhaps average cost per MB beyond free quota.

Expected Behaviour / Sample Calculation (not code)

Using given example:

- Plan B, usage 2500 MB
- Included: 1000 MB
- Extra: $2500 - 1000 = 1500$ MB chargeable at 0.015 USD/MB → data charge = $1500 * 0.015 = 22.5$ USD
- Since $2500 > 2000$, discount applies on $(2500 - 2000) = 500$ MB portion of charge beyond 2000 MB
- Portion beyond 2000 MB charge = $500 * 0.015 = 7.5$ USD
- Discount = 5% of 7.5 = 0.375 USD

- Final cost = 20 (flat-rate) + 22.5 – 0.375 = 42.125 USD

Also compute over_usage = 1500 MB.