Coding Challenge

Craft what you love,
love what you craft

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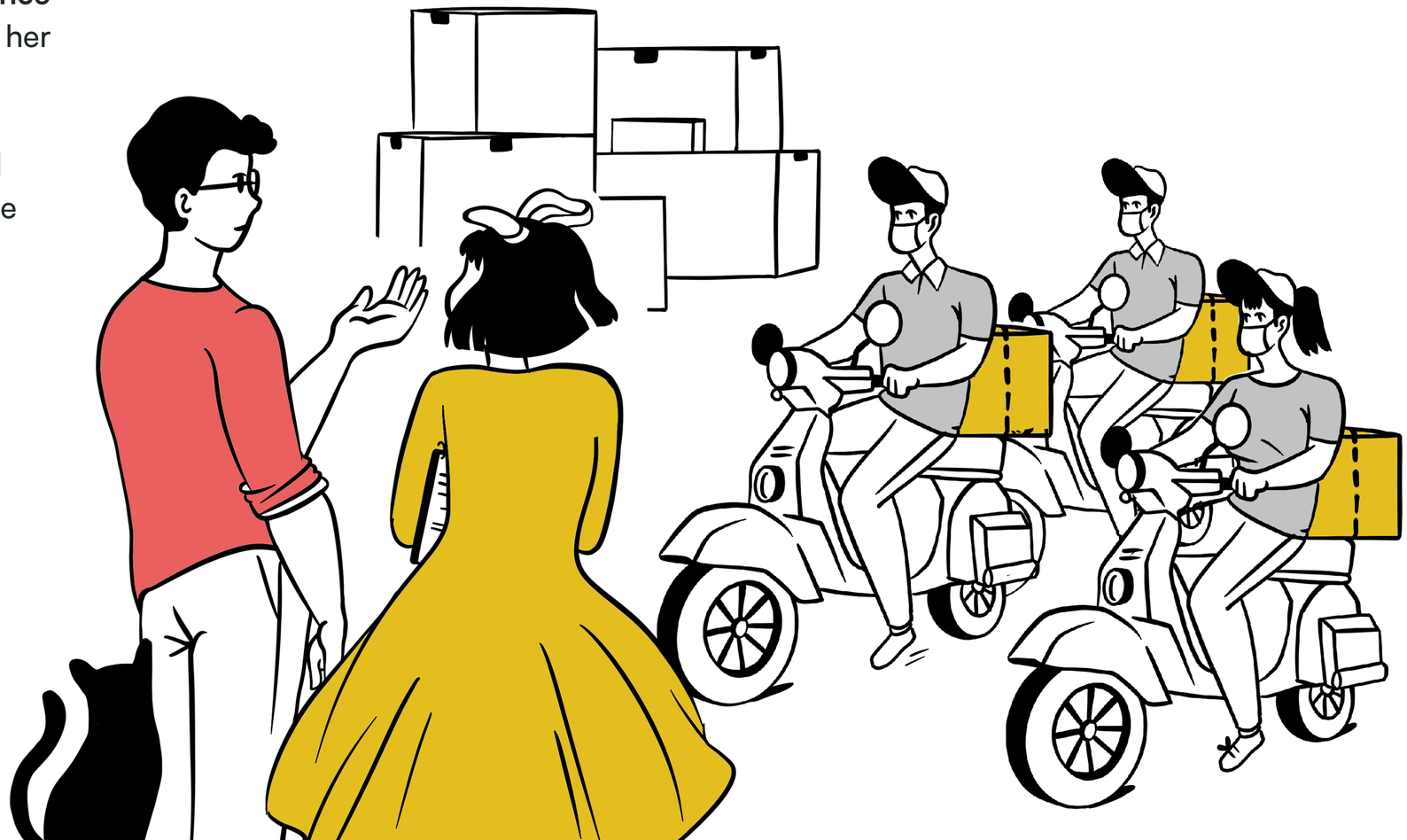
Background

Kiki, a first-time entrepreneur from the city of Koriko has decided to open a **small distance courier service** to deliver packages, with her friend Tombo and cat Joji.

Kiki has invested in **N** no. of **vehicles** and have **driver partners** to drive each vehicle & deliver packages.



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Problem 01

Delivery Cost Estimation with Offers

Since it's a new business, the team has decided to **pass coupons** around the town which will help them attract more customers.

Things to keep in mind:

Only **one** offer code can be applied for any given package.

Package should meet the required mentioned **offer criterias.**

If offer code is **not valid/found**, discounted amount will be equal to 0.

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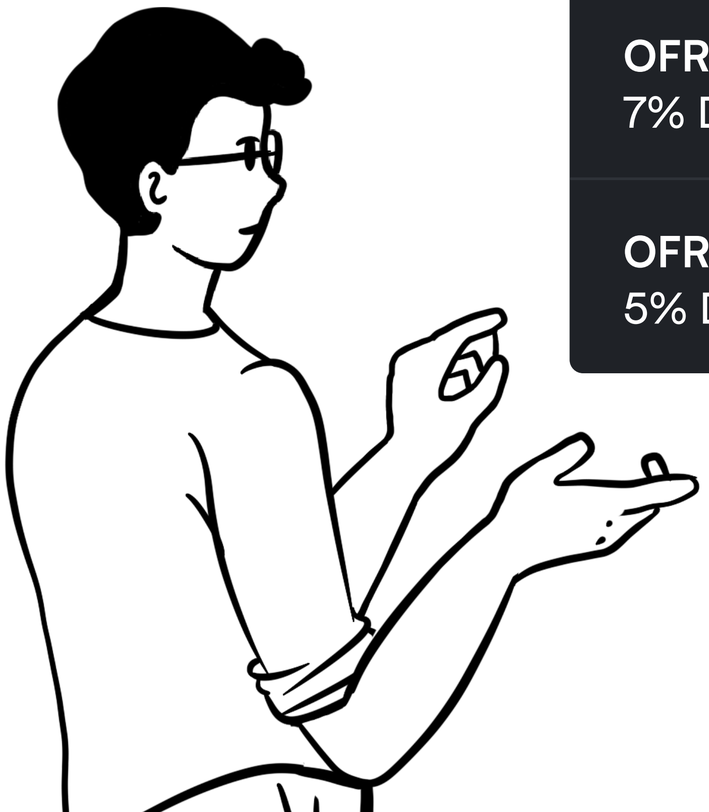
Offer Criteria

The offers can be used according to the criteria that Tombo has captured in this table. Discount will not be provided if no offer code is applied.

	Distance (km)	Weight (kg)
OFR001 10% Discount	< 200	70–200
OFR002 7% Discount	50–150	100–250
OFR003 5% Discount	50–250	10–150



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Challenge

You are required to build a command line application to estimate the **total delivery cost** of each package with an offer code (if applicable).

Note: Code should be extensible & scalable for more offer codes.

Base Delivery Cost + (Package Total Weight * 10) + (Distance to Destination * 5) =

Delivery Cost

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Sample Input Formats

Input Format

base_delivery_cost no_of_packges
pkg_id1 pkg_weight1_in_kg distance1_in_km offer_code1
...

Sample (I)

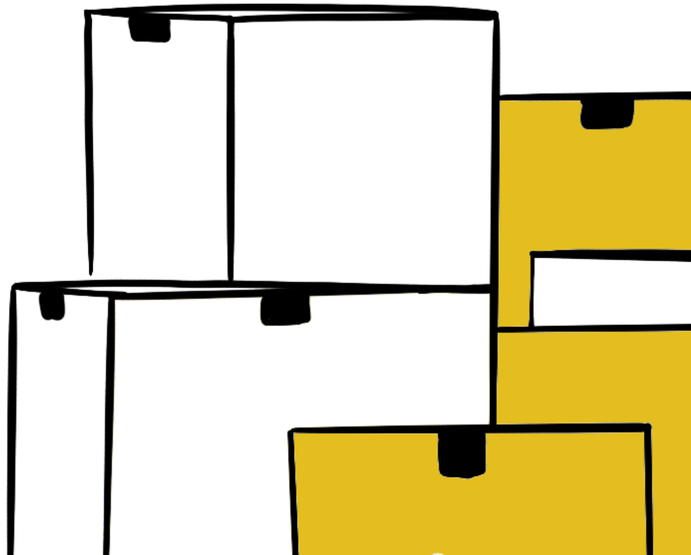
100 3
PKG1 5 5 OFR001
PKG2 15 5 OFR002
PKG3 10 100 OFR003

Output Format

pkg_id1 discount1 total_cost1
...

Sample (O)

PKG1 0 175
PKG2 0 275
PKG 35 665



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Explanation

PKG 1: Testcase

Base.delivery cost: **100**
Weight: **5kg** | Distance: **5km**
Offer code: **OFR001**

Delivery Cost 100 + (5 * 10) + (5 * 5)	**175.00**
Discount (Offer not applicable as criteria not met)	**– 0.00**
Total cost	**175.00**

PKG 3: Testcase

Base.delivery cost: **100**
Weight: **10kg** | Distance: **100km**
Offer code: **OFR003**

Delivery Cost 100 + (10* 10) + (100 * 5)	**700.00**
Discount (5% of 700 i.e; Delivery Cost)	**– 35.00**
Total cost	**665.00**

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Problem 02

Delivery Time Estimation

Now all these packages should be delivered to their destinations in the fleet of vehicles Kiki owns. She has **N** no. of vehicles available for delivering the packages.

Things to keep in mind:

Each Vehicle has a **limit (L)** on **maximum weight (kg)** that it can carry.

All Vehicles travel at the same **speed (S** km/hr**)** and in the **same route.** It is assumed that all the destinations can be covered in a single route.

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Delivery Criteria

The delivery can be made using the criteria illustrated below.

Shipment should **contain max packages** vehicle can carry in a trip.

We should prefer **heavier packages** when there are multiple shipments with the same no. of packages.

If the weights are also the same, preference should be given to the **shipment which can be delivered first.**

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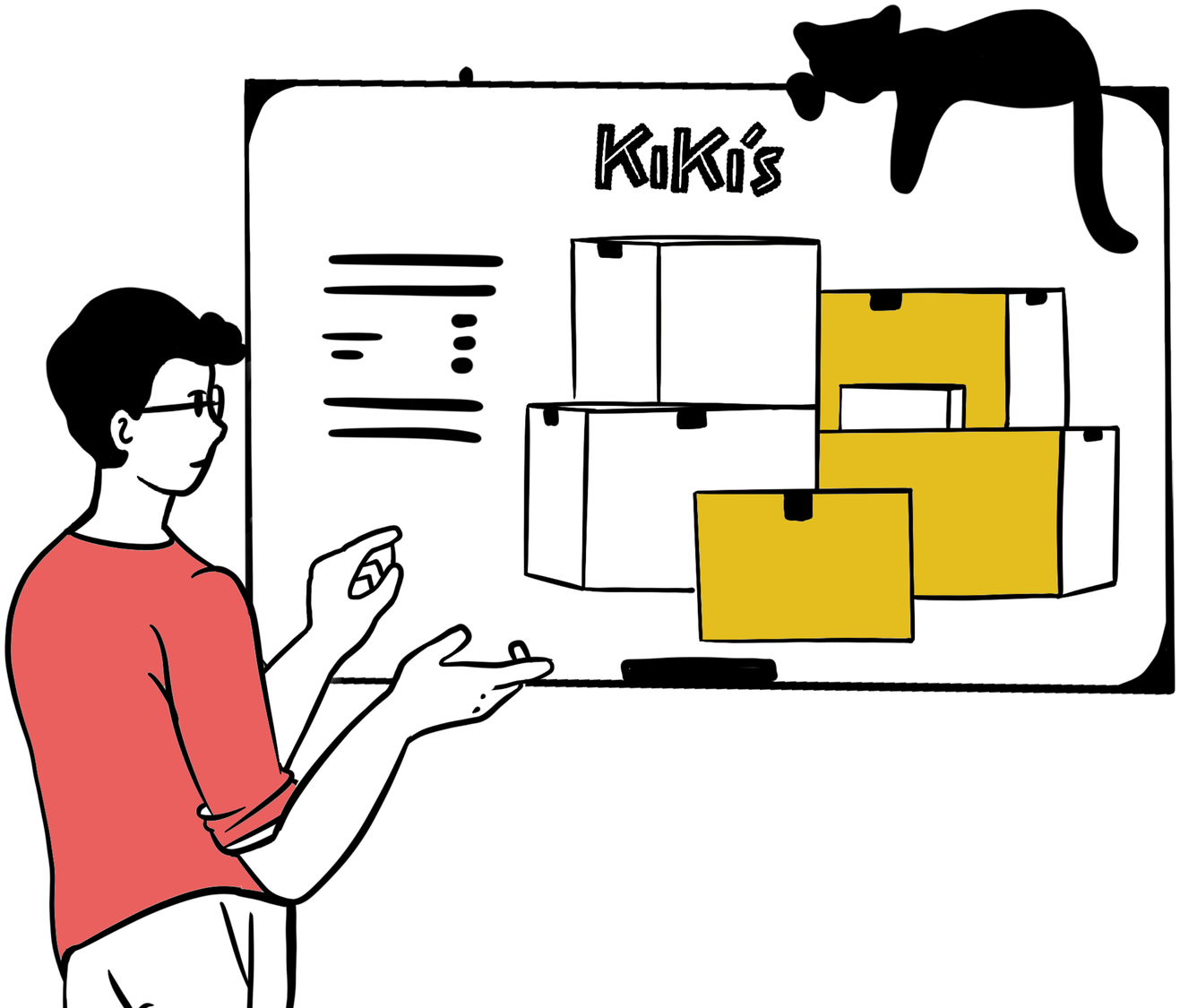
Challenge

Tombo, the geeky business partner obsessed with delivery metrics wants to maximise efficiency.

You are required to build a command line application to calculate the **estimated delivery time** for every package by **maximizing no. of packages in every shipment.**



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Sample Input Formats

Input Format

base_delivery_cost no_of_packges
pkg_id1 pkg_weight1_in_kg distance1_in_km offer_code1
....
no_of_vehicles max_speed max_carriable_weight

Sample (I)

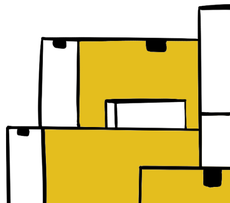
100 5
PKG1 50 30 OFR001
PKG2 75 125 OFFR0008
PKG3 175 100 OFFR003
PKG4 110 60 OFFR002
PKG5 155 95 NA
2 70 200

Output Format

pkg_id1 discount1 total_cost1 estimated_delivery_time1_in_hours
...

Sample (O)

PKG1 0 750 3.98
PKG2 0 1475 1.78
PKG3 0 2350 1.42
PKG4 105 1395 0.85
PKG5 0 2125 4.19



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Explanation

Packages	05	Vehicles	02	Max Speed	70km/hr	Max load	200kg

STEP 01

Packages Remaining: **05**

Vehicles Available: **02** | Current Time: **0 hrs**

PKG1 50kg + **PKG2** 75kg → **02** packages 125kg

PKG1 50kg + **PKG4** 110kg → **02** packages 160kg

PKG2 75kg + **PKG4** 110kg → **02** packages 185kg

Vehicle 01

Delivering PKG2 — **1.78 hrs**
125km/70km/hr

Delivering PKG4 — **0.85 hrs**
60/70km/hr

Vehicle 01 will be available after (2*1.78) **3.56 hrs**

STEP 02

Packages Remaining: **03**

Vehicles Available: **01** | Current Time: **0 hrs**

PKG1 50kg | **PKG3** 175kg | **PKG5** 155kg → **01** package (PKG3) 175 kg (Most Weight)

Vehicle 02

Delivering PKG3 — **1.42 hrs**
100km/70km/hr

Vehicle 02 will be available after (2*1.42) **2.84 hrs**

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Explanation (Contd. 1)

STEP 03

Packages Remaining: **02**

Vehicles Available: **0** | Current Time: **0 hrs**

Vehicle 01	Returning in	**3.56 hrs**
Vehicle 02	Returning in	**2.84 hrs**

Vehicle 02 will be available first after (Current Time (0) + 2.84) **2.84 hrs**

STEP 04

Packages Remaining: **02**

Vehicles Available: **01** | Current Time: **2.84 hrs**

PKG1 50kg	**PKG5** 155kg	→	**01** package (PKG5) 155 kg (Most Weight)

Vehicle 02	Delivering PKG5 (2.84+ 1.35) Current Time + 95km/70km/hr	**4.19 hrs**

Vehicle 02 will be available after (2.84+ 2*1.35) **5.54 hrs**

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Explanation (Contd. 2)

STEP 05

Packages Remaining: **01**

Vehicles Available: **0** | Current Time: **2.84 hrs**

Vehicle 01	Returning in	**3.56 hrs**
Vehicle 02	Returning in	**5.54 hrs**

Vehicle 01 will be available first after **0.72 hrs**

STEP 06

Packages Remaining: **01**

Vehicles Available: **01** | Current Time: **3.56 hrs**

PKG1 → **01** package
50kg 50kg

Vehicle 01	Delivering PKG4 (3.56+ 0.42) Current Time + 30km/70km/hr	**3.98 hrs**