

CSIT121 – Lab 3  
Due date: 1 May 2022

Write a program to store and search for parcels handled by a delivery company. A parcel has the following instances variables: parcel code, length, width, height and weight. Length, width and height are measured in centimeter and weight is measured in Kg.

The delivery fee of a parcel is calculated as follow:

First Kg or less	\$3
Additional weight above 1 <sup>st</sup> Kg	\$1 per Kg or part of
Example	Weight is 2.1 Kg 1 <sup>st</sup> Kg → \$3 Next 1 Kg → \$1 Next 0.1 Kg → \$1 Delivery fee → \$5

A parcel has a volumetric weight calculated as follow:  $\text{volumetric weight} = \text{parcel volume} / 5000$   
The greater value between weight and volumetric weight will be used to calculate the delivery fee. Here is an example.

Parcel length, width, height	10, 20, 30
Volume	$10 \times 20 \times 30 = 6000$
Volumetric weight	$6000 / 5000 = 1.2 \text{ Kg}$
Physical weight	1 Kg
Actual weight used in calculation	<b>1.2 Kg</b>
Delivery fee	$\$3 + \$1 = \text{\$4}$

An express parcel is guaranteed to be delivered within 8 hours. For express parcel, the delivery fee is calculated as follow:

Express parcel	Usual delivery fee + additional 20%
Long distance, express parcel	Usual delivery fee + additional 35%

The program will allow user to enter parcel records and save them in an ArrayList. Each record is either a usual parcel or an express parcel. The following screenshots illustrate the data entry process.

```
Parcel code: p1
Length: 10
Width: 10
Height: 20
Weight: 1.2
Express (y/n)? n
```

```
Parcel code: p2
Length: 10
Width: 20
Height: 30
Weight: 2
Express (y/n)? y
Long distance (y/n)? n
```

```
Parcel code: p3
Length: 20
Width: 10
Height: 5
Weight: 0.8
Express (y/n)? y
Long distance (y/n)? y
```

When the data entry is completed, the program will display the following options.

```
1 Show all items
2 Show express items
3 Quit
Your selection:
```

For option 1, the program will display all parcels.

```
Your selection: 1
P1 $4.0
Express P2 $4.8
Express P3 $4.05
```

For option 2, the program will only the express parcels.

```
Your selection: 2
Express P2 $4.8
Express P3 $4.05
```

Your program should consist of three classes as follow:

class	Parcel
Instance variables	code length, width, height weight You may declare additional instance variable(s) as you deem fit.
Constructor	The constructor will receive 5 parameters and initialize the instance variables accordingly.
Get methods	getCode getLength getWidth getHeight
Instance method	getVolume Parameters: None Returns: The parcel volume.
Instance method	getVolumetricWeight Parameters: None Returns: The volumetric weight.
Instance method	getFee Parameter: None Returns: The delivery fee based on the weight or volumetric weight.
Instance method	toString Parameters: None Returns: A descriptive String

class	Parcel8 (Subclass of Parcel)
Instance variables	long distance You may declare additional instance variable(s) as you deem fit.
Constructor	The constructor will receive appropriate parameters for initializing the instance variables.
Get methods	getLongDistance
Instance method	getFee Parameters:None Returns: Usual delivery fee + additional fee
Instance method	toString Parameters: None Returns: A descriptive String.

class	<i>XX_YourName_Lab3</i> where XX is your tutorial class (e.g. T1, T2, etc.)
Static method	main Prompts user to enter parcel records (instances of Parcel and Parcel8). Saves the records in an ArrayList of Parcel. Allows user to view the records <ul style="list-style-type: none"> <li>• all parcels</li> <li>• only the expressed parcels (Parcel8)</li> </ul>

#### Source code comments

Please include appropriate comments in the program.

#### Submission

Please submit a single Java file (containing the above three classes) to Moodle.