Programming Demonstration

Software Engineering

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Overview

We'd like you to implement a Java solution to the following specification, and a JUnit test suite with tests as specified. The demonstration does not require a user interface or database.

There is no time restriction. We encourage you to instead implement as elegant and robust a solution as you can. We are most interested to see how you think about and solve a problem.

Please make your code available to us by posting it to GitHub as follows:

- If you don't have a GitHub account, create one for free at https://github.com/
- Name the git repository for this demo as [your initials][mm][yy] Example: tb0321
- Do not include this spec document in your Github project.
- Do not include our company name in your code or Github description.
- Allow public access to the project. That allows us to review it.
- Respond via email with the github URL of the project

Specification

The demonstration is to code and test a simple tool rental application.

- The application is a point-of-sale tool for a store, like Home Depot, that rents big tools.
- Customers rent a tool for a specified number of days.
- When a customer checks out a tool, a Rental Agreement is produced.
- The store charges a daily rental fee, whose amount is different for each tool type.
- Some tools are free of charge on weekends or holidays.
- Clerks may give customers a discount that is applied to the total daily charges to reduce the final charge.

Tools

The tools available for rental are as follows:

Tool Code	Tool Type	Brand
CHNS	Chainsaw	Stihl
LADW	Ladder	Werner
JAKD	Jackhammer	DeWalt
JAKR	Jackhammer	Ridgid

Each tool instance has the following attributes:

Tool Code - Unique identifier for a tool instance

Tool Type - The type of tool. The type also specifies the daily rental charge, and the days for which the daily rental charge applies.

Brand - The brand of the ladder, chain saw or jackhammer.

	Daily charge	Weekday charge	Weekend charge	Holiday charge
Ladder	$1.99	Yes	Yes	No
Chainsaw	$1.49	Yes	No	Yes
Jackhammer	$2.99	Yes	No	No

Holidays

There are only two (2) holidays in the calendar:

- **Independence Day**, July 4th - If falls on weekend, it is observed on the closest weekday (if Sat, then Friday before, if Sunday, then Monday after)
- **Labor Day** - First Monday in September

Checkout

Checkout requires the following information to be provided:

- Tool code - See tool table above
- Rental day count - The number of days for which the customer wants to rent the tool. (e.g. 4 days)
- Discount percent - As a whole number, 0-100 (e.g. 20 = 20%)
- Check out date

Checkout should throw an exception with an instructive, user-friendly message if

- Rental day count is not 1 or greater
- Discount percent is not in the range 0-100

Checkout generates a Rental Agreement instance with the following values.

- Tool code - Specified at checkout
- Tool type - From tool info
- Tool brand - From tool info
- Rental days - Specified at checkout
- Check out date - Specified at checkout
- Due date - Calculated from checkout date and rental days.
- Daily rental charge - Amount per day, specified by the tool type.
- Charge days - Count of chargeable days, from day after checkout through and including due date, excluding “no charge” days as specified by the tool type.
- Pre-discount charge - Calculated as charge days X daily charge. Resulting total rounded half up to cents.
- Discount percent - Specified at checkout.
- Discount amount - calculated from discount % and pre-discount charge. Resulting amount rounded half up to cents.
- Final charge - Calculated as pre-discount charge - discount amount.

Rental Agreement should include a method that can print the above values as text to the console like this:

Tool code: LADW
Tool type: Ladder
...
Final charge: $9.99

with formatting as follows:

- Date mm/dd/yy
- Currency $9,999.99
- Percent 99%

Tests

Your code must include JUnits to prove your solution is correct.

The proof should include the following scenarios:

	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Tool code	JAKR	LADW	CHNS	JAKD	JAKR	JAKR
Checkout date	9/3/15	7/2/20	7/2/15	9/3/15	7/2/15	7/2/20
Rental days	5	3	5	6	9	4
Discount	101%	10%	25%	0%	0%	50%