



ITCS 209 Object Oriented Programming	Name:	Lab	Challenge Bonus	
	ID:			
	Section:			

## Lab02: Data Type, Decision and Loop – Parking Ticket

In this lab, you will be implementing a simple parking ticket program.

The parking ticket program finds how long each car has been parked in the parking lot, and calculates the total parking fee based on the given parking rate. To complete this program in JAVA, you must create a class called “ParkingTicket” in ParkingTicket.java. In the main method, you have to complete the following tasks.

### Task 1: Compute total parking duration

- 1.1 Create two variables to keep the times when entering and leaving the parking lot in military format (e.g., 0950 means 09:50, and 1715 means 17:15) – *Question: What should be the data type for these variables?*
- 1.2 Compute the total parking duration by finding the number of hours and minutes between those two times (the two variables in step 1.1). Here is a sample result.  
If the entering time is “0950” and the leaving time is “1715”, the parking duration is 7 hours and 25 minutes
- 1.3 Your program should print the following message

```
Entering time -> 0950
Leaving time  -> 1715
Parking duration: 7 hours and 25 minutes
```

### Task 2: Visualize the parking duration

- 2.1 Display the hours and minutes from task 1 in form of symbols pattern. You can design your own pattern. Here is a sample result.

```
| ***** | ***** | ***** | ***** | 1 hr
| ***** | ***** | ***** | ***** | 2 hr
| ***** | ***** | ***** | ***** | 3 hr
| ***** | ***** | ***** | ***** | 4 hr
| ***** | ***** | ***** | ***** | 5 hr
| ***** | ***** | ***** | ***** | 6 hr
| ***** | ***** | ***** | ***** | 7 hr
| ***** | ***** | ***** | ***** | 25 min
```

### Task 3: Calculate parking fee

- 3.1 Here is the parking rate. The first two hours is free and each additional hour is 99 Baht. Fraction of an hour will be rounded up to the next 30 minutes. For examples, 7 hours 25 minutes is counted as 7 hours 30 minutes. While, 7 hours 35 minutes is counted as 8 hours.
- 3.2 Based on the parking duration in task 1, calculate the parking fee using the given parking rate. For example, if the parking duration is 7 hours 25 minutes, the parking fee is 544.50. This number is calculated as follow. The first two hours is free, additional 5 hours cost 495 Baht (5\*99), and the remaining 25 minutes is rounded up to 30 minutes which costs 49.50 Baht.
- 3.3 The program should print the following message

```
Parking fee: 544.5
```

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### Challenge Bonus (Optional):

Complete the following two tasks to gain bonus score.

#### Task A: Allow overnight parking

Usually, the entering time should be less than the leaving time. If the entering time is later than the leaving time, this means the car is parked overnight.

For example, if the entering time is "1715" and the leaving time is "0950", the parking duration is 16 hours and 35 minutes. The "(overnight)" message should be noted at the leaving time. Here is a sample result.

```
Entering time -> 1715
Leaving time  -> 0950 (overnight)
Total duration: 16 hours and 35 minutes

|*****|*****|*****|*****| 1 hr
|*****|*****|*****|*****| 2 hr
|*****|*****|*****|*****| 3 hr
|*****|*****|*****|*****| 4 hr
|*****|*****|*****|*****| 5 hr
|*****|*****|*****|*****| 6 hr
|*****|*****|*****|*****| 7 hr
|*****|*****|*****|*****| 8 hr
|*****|*****|*****|*****| 9 hr
|*****|*****|*****|*****| 10 hr
|*****|*****|*****|*****| 11 hr
|*****|*****|*****|*****| 12 hr
|*****|*****|*****|*****| 13 hr
|*****|*****|*****|*****| 14 hr
|*****|*****|*****|*****| 15 hr
|*****|*****|*****|*****| 16 hr
|*****|*****|*****|*****| 35 min

Total parking fee: 1485.0
```

#### Task B: Implement methods/functions

Create a static method called `printParkingDuration(String enterTime, String leaveTime)` to print the entering time, leaving time, and parking duration message as mentioned in task 1. This method must receive two parameters as input which are entering time and leaving time respectively.

Create a static method called `printParkingFee(int hour, int minute)` to calculate the parking fee and print out the message as shown in task 3. This method receives two parameters as input which are number of hours and minutes of the parking duration respectively.

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