# Surveillance Cost Calculator Problem (Pro-Vigil)

## Overview

Engineers at Pro-vigil spend the majority of their time developing production code. As such, code quality and design fundamentals are critical to success here. The following problem is intended to serve as the basis for the remainder of the interview process. Please devote some time to providing us with an implementation which reflects your ideals of code quality and proper unit testing.

During the interview we will make reference to this problem and your solution. Please be prepared to conduct a more in-depth analysis when you arrive. This will include discussing implications for more real life scenarios; addressing issues such as scaling, configurability, validation, and varying inputs.

If you have any questions concerning the problem we would be happy to clarify the requirements. Also, we have provided a sample Maven project. The attached project includes dummy classes and sample input to give you a starting point. You may use this sample project if you wish, but are not required to do so if you are not familiar with Maven.

## Problem Description

Please write a program that can identify surveillance cost by the square footage area. The per square foot cost is identified by the MONTHLY/YEARLY payment plan opted by the customer. Given the input containing the plan and square footage area, calculate the total cost customer would be paying every **month**.

Your solution should expect XML file as input. The XML file containing records specifying sample plan and square foot area will be provided. The expected output of the solution is the total monthly cost to be paid by the customer.

The program should be written in Java. Please provide the source code and unit tests in a runnable state. Feel free to use the accompanying Maven based project, but its use is not required if you are not familiar with Maven. Your unit tests should be written in either JUnit or TestNG.

You can spend as much time as you like on the project, but typically, we expect you to spend about two to four hour to come up with a solution and a backlog of ideas on how to improve the system.

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**Calculate monthly cost by the plan and square ft. area**

Use the following table as the basis for your cost calculation. The table indicates different plans and charges as per square ft area of the property.

| Location | Square Footage (sq.ft. ) | Surveillance Cost (sq.ft / month) | |
|---|---|---|---|
| | | MONTHLY PLAN | 1 YEAR COMMITMENT PLAN |
| Indoor | <= 2500 | $2 / sq ft / month | $1.5 / sq ft / month |
| Outdoor | <= 2500 | $2.5 / sq ft / month | $2 / sq ft / month |
| Indoor **or** Outdoor | 2501 - 5000 | Indoor $1.5 / sq ft / month<br>Outdoor $1.5 / sq ft / month | Indoor $1 / sq ft / month<br>Outdoor $1 / sq ft / month |
| Indoor **or** Outdoor | 5001 - 50000 | Indoor $1 / sq ft / month<br>Outdoor $1.2 / sq ft / month | Indoor $0.6 / sq ft / month<br>Outdoor $0.8 / sq ft / month |
| Indoor **or** Outdoor | 50001+ | Indoor $0.8 / sq ft / month<br>Outdoor $0.8 / sq ft / month | Indoor $0.5 / sq ft / month<br>Outdoor $0.5 / sq ft / month |

**Note:**
Total cost would be the sum of square ft cost at every slab as per Plan.
**Example:** The monthly cost of surveillance area of **25000**(sq.ft.) for **MONTHLY** plan with location **Outdoor** would be calculated as below

1. 2500 * $2.5 = $6250
2. 2500 * $1.5 = $3750
3. (25000 - (2500+2500)) * $1.2 = $24000

Total monthly cost = $6250 + $3750 + $24000 = $**34000**

Similarly, the monthly cost of surveillance area of **25000**(sq.ft.) for **MONTHLY** plan with location **Indoor** would be calculated as below

1. 2500 * $2 = $5000
2. 2500 * $1.5 = $3750
3. (25000 - (2500+2500)) * $1 = $20000

Total monthly cost = $5000 + $3750 + $20000 = $**28750**

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**Sample Test-cases**

Here are some of the test cases and corresponding input / output expectations:

**Sample Data**

| Area (Sq.ft) | Plan | Location | Total Monthly Cost |
|---|---|---|---|
| 2500 | MONTHLY | Indoor | $5000 |
| 2500 | 1 YEAR COMMITMENT | Indoor | $3750 |
| 4000 | MONTHLY | Outdoor | 2500*2.5 + 1500*1.5 = $8500 |
| 4000 | 1 YEAR COMMITMENT | Outdoor | 2500*2 + 1500*1 = $6500 |
| 25000 | MONTHLY | Indoor | 2500*2+2500*1.5+20000*1 = $28750 |
| 25000 | 1 YEAR COMMITMENT | Indoor | 2500*1.5+2500*1+20000*0.6 =$18250 |

In the following sample data, `<subscription> with specific ids` are specified as input and the application will calculate the total cost and populate it in the `<result> element`.

**INPUT**

```
<subscriptions>
   <subscription>
      <id>1</id>
      <area>2500</area>
      <plan>MONTHLY</plan>
      <location>Indoor</location>
   </subscription>
   <subscription>
      <id>2</id>
      <area>4000</area>
      <plan>YEARLY</plan>
      <location>Outdoor</location>
   </subscription>
</subscriptions>
```

**OUTPUT**

```
<result>
   <subscription>
      <id>1</id>
      <cost>5000</cost>
   </subscription>
   <subscription>
      <id>2</id>
      <cost>6500</cost>
   </subscription>
</result>
```