Core Java

Task Sheet

General Instructions

You will have the afternoon to complete these tasks.

Create a new project for all of the following tasks. As a suggestion, you can call your main project “tasks” but you can call it whatever suits you.

Each task will go into its own separate package and will be run individually. Each task will require its own `main` method. This would mean the following structure with each `App.java` file having its own `main`.

```
|- com.sparta
        |
        |- day1
        |     |- debug
        |     |     |- DebugApp.java
        |     |
        |     |- calculator
        |           |- CalculatorApp.java
        |
        |- day2
```

For all tasks you should be able to explain and justify the solution that you arrive at.

Core Java

Tasks

Cuboid

Package: com.sparta.day2.cuboid

Class: CuboidApp

Write a program to calculate and output the surface area and volume of a cuboid.

The program should prompt the user for positive integers representing the width, length and height of the cuboid.

Assume that all data entered is valid.

Shopping List

Package: com.sparta.day2.weeklyshop

Class: WeeklyShopApp

Write a program that prompts for the amount and the price of the following items:

- Peaches (one of)
- Beans (can of)
- Chicken pieces (packet of)
- Socks (pair of)
- Bottle of water

Your program should then calculate and output the total cost and the number of items purchased.

An example of the output that is expected is:

```
Peaches
-how many? 2
-price? 0.6
Beans
-how many? 3
-price? 0.5
Chicken pieces
-how many? 4
-price? 2.65
Socks
```

```
-how many? 5
-price? 1.25
Bottle of water
-how many? 1
-price? 0.8
Total number of items purchased: 15
Your weekly shop cost: 20.35
```

Distance Calculator

Package: com.sparta.day2.distancecalculator

Class: DistanceCalculatorApp

Write a program that calculates the distance travelled by an object moving with constant acceleration.

The formula you will need to perform the calculation is:

$$s = ut + \frac{1}{2}at^2$$

where:

$s = \text{distance}$

$u = \text{initial velocity}$

$t = \text{time taken}$

$a = \text{acceleration}$

Your program should prompt the user for values for *u*, *t* and *a*. Assume the units for input as being metres per second (m/s), seconds and metres per second per second (m/s^2).

Consider how you will test this and note down your strategy.

Address

Package: com.sparta.day2.address

Class: AddressApp

Write a program to prompt the user to input a surname, an integer house number, a road name and a town on separate lines and output it formatted as an address as follows:

```
Mr and Mrs <surname>,
```

```
<house number>, <road name>
<town>
```

where the actual data replaces the words inside the angle brackets. So, for example:

```
Mr and Mrs Windsor,
1, The Mall
London
```

Cost of Living

Package: com.sparta.day2.livingcost

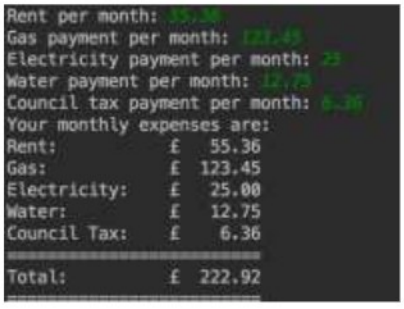
Class: LivingCostApp

Write a program to prompt the user for the following data for monthly costs:

- Rent
- Gas
- Electricity
- Water
- Council tax

Assume that the maximum value to be entered will be 9999.99 and that all values entered will be positive.

Your program will then output these costs and a total in a formatted table:



A matter of time

Package: com.sparta.day2.seconds

Class: SecondsApp

Write a program to prompt the user for a positive integer number of seconds and output the number of hours, minutes and seconds that it represents.

Core Java

For example, if the number of seconds input is 3793, the data should be formatted as follows:

Input	Hours	Minutes	Seconds
3793	1	3	13