

Exercise 1

Matilda is trying to create a timetable with all the activities that Mugatu, one important celebrity, has been doing. For each move that the celebrity has done, she needs a particular timestamp so that she can place it under some pictures that she's connecting on a big board.

She decided to start the timetable counting from the 13th of March of 2003 at 10 o'clock in the morning.

Develop test classes that calculate and assert the following interests from Matilda:

- He wakes up and stops his alarm. What time is it displayed in the format Hours:Minutes? What day of the week is this?
- It takes him 37 minutes and 21 seconds to get ready to be picked up by the limousine. What time is it displayed in the format Hours:Minutes:Seconds?
- The limousine arrives at the airport one and a half hours later because of traffic jam. At what time do they arrive at the airport?
- Mugatu checks the departure time of his flight and it says 11:04 am. Is this time before the current one? Did he miss his flight?
- He asks at the info desk when the next flight is. The next flight will be at 18:45. How many hours and minutes does he have to wait?
- He finally gets in the plane and departs at 18:45 from London. It takes him 11 hours and 50 minutes to land in Tokyo. What time is it in London? What date and time is it in Tokyo?
- After two hours he manages to arrive to his hotel in Tokyo and sleeps for 9 hours straight until he wakes up abruptly. At what time is his manager hitting him in the head with the pillows to wake him up?
- They tell him that the advertisement shooting starts in 47 minutes. When is that exactly?
- They throw him with his clothes and make up set into the limousine and rush towards the studio arriving just in time. However, Mugatu received a private phone call from his assistant Katinka that lasted 546 seconds. How much time in minutes and seconds did Mugatu have to get prepared in the limousine?
- After 7 hours the shooting is over. Lunch time is round 13:00 and dinner time is around 20:00. Should Mugatu have lunch or dinner?
- After three days and 12 hours, Mugatu finally takes his flight back to London. After the 11 hours and 50 minutes of flight back, he lands in London. What time is it in Tokyo? What date is it in London?
- At the airport he gets surrounded by 173 fans and it takes him 12 seconds to give each one of them an autograph. How many hours and minutes did he spend dispatching his fans?
- Mugatu arrives at his hotel one hour later and decides to go to the sauna. This one is only open from 9:00 to 14:00 and from 16:00 to 20:00. Can he at least manage to stay in the sauna for half an hour?
- The special one-hour massage offered by the hotel is on Thursdays and Sundays, and if it is a leap year, also on Saturdays. Can Mugatu be lucky enough to get one of those?
- One week later, the advertisement is broadcasted at 18:30 in Tokyo's time. When does Mugatu have to turn on the TV in London to be able to see it?
- The advertisement lasts 29 seconds. Fifteen seconds afterwards his manager calls him on the phone to congratulate him for his popularity increase. At what time exactly does this happen? What day of the week is this?
- How many days have passed by since he woke up at the beginning of the timetable?
- Mugatu gets paid for the timetable rights 1.39 Euro per minute of his privacy since the beginning of the timetable until the end, except for the time of the private call that Mugatu had with Katinka. How much is he paid for this reportage?

Exercise 2 [problem solving - easy]

Write the method *toMilitaryTime*, that receives a String representing a time in 12-hour format and returns a String representing that time in 24-hour format. Have in mind that midnight is 12:00:00 AM on a 12-hour clock, and 00:00:00 on a 24-hour clock. Also that noon is 12:00:00 PM on a 12-hour clock, and 12:00:00 on a 24-hour clock.

Input 07:05:45PM
Output 19:05:45

Exercise 3 [problem solving - easy]

Write the method *toWords* that receives two Integers, one representing the hour of the day and another representing minutes after the hour. The method returns a description into words of that given time.

Part A

The rules of the conversion are:

- At minutes = 0, use o'clock
- For minutes < 30, use past
- For minutes > 30, use to

Create meaningful unit tests.

Input 5, 47
Output thirteen minutes to six

Input 3, 00
Output three o' clock

Part B

Upgrade the existing rules to reflect the following changes:

- For hours between 6:00 and 11:59, say *in the morning*
- At 12 o'clock, replace the whole message by *noon*
- For hours between 12:01 and 5:00, add *in the afternoon*
- For hours between 5:01 and 20:00, add *in the evening*
- For hours between 20:01 and 5:59, add *at night*

Update your meaningful unit tests and add the necessary ones.

Input 5, 47
Output thirteen minutes to six at night

Input 15, 00
Output three o'clock in the afternoon

Exercise 4 [problem solving - easy]

There are three types of edits that can be performed on strings:

- Insert a character
- Remove a character
- Replace a character

Given two strings, write a method to check if they are one edit (or zero edits) away.

Create meaningful unit tests. At the end of each test, display how many milliseconds it took to the method to perform its calculation.

```
pale, ple-> true
pale, pales -> true
pale, bale -> true
pale, bake -> false
```

Exercise 5 [problem solving - medium]

Once upon a time, on a way through the old wild west, a man was given directions to go from one point to another. The directions were "NORTH", "SOUTH", "WEST", "EAST". Clearly "NORTH" and "SOUTH" are opposite, "WEST" and "EAST" too. Going to one direction and coming back the opposite direction is a needless effort. Since this is the wild west, with dreadful weather and not much water, it's important to save yourself some energy, otherwise you might die of thirst!

This is how I crossed the desert the smart way. The directions given to the man are, for example, the following: ["NORTH", "SOUTH", "SOUTH", "EAST", "WEST", "NORTH", "WEST"].

You can immediately see that going "NORTH" and then "SOUTH" is not reasonable, better stay to the same place! So the task is to give to the man a simplified version of the plan. A better plan in this case is simply: ["WEST"]

Write the method *simplifyDirections* which will take a list of strings and returns a list of strings with the needless directions removed (W<->E or S<->N side by side). The order of the unremoved directions should be protected. (Only the consecutive directions are allowed to be cancelled/removed.)

```
Input  ["NORTH", "SOUTH", "EAST", "WEST"]
Output []

Input  ["NORTH", "EAST", "WEST", "SOUTH", "SOUTH", "WEST"]
Output ["SOUTH", "WEST"]
```

Exercise 6 [hero's quest board contribution]

Find two difficult coding challenges on the internet and place them in the *Hero's Quest Board™*. Make sure they were not placed there by some other hero before! Don't forget to mention your name next to the challenge.

Exercise 7 [hero's quest board challenge]

Solve at least four challenges from the *Hero's Quest Board™*. At the end of the week we will vote which challenges were the hardest ones and we will give points to the Challengers who found them and to the Heroes who solved the most. The quality of the solution matters!