

Question 2 [40 marks]

GoGreen is a cash-only juice bar that sells a variety of organic prepared juice beverages. Tourists who visit the juice bar often pay with large bills and require change.

Use dynamic programming to **count the number of ways of making change**.

You may only use the denominations R1, R2, R5, R10, R20, R50, R100 and R200 to make change. The number of ways to make change must be distinct. For example, the number of ways of making change for R6 from {R1, R2, R5} is 5. The 5 ways are:

- {R1, R1, R1, R1, R1, R1}
- {R1, R1, R1, R1, R2, R2}
- {R1, R1, R2, R2, R2}
- {R2, R2, R2}
- {R5, R1}

You are provided with a summary of the receipts from GoGreen in `juice.csv`:

```
//bill; tip amount; amount received
28;7;40
62;8;90
256;31;400
33;15;200
24;5;60
88;19;110
71;9;90
43;12;70
311;14;360
607;61;800
```

Display the result for each receipt on the console using `System.out.println()`, e.g.

Input: R40 (bill)
 R4 (tip amount)
 R50 (amount received)

Output: The final amount to pay is R44.
 The customer requires R6 change.
 The number of ways to make change for R6 is 5.

Your driver program must be named `Question2.java`

Question 3 [40 marks]

Word games are a fun way to test a player's general knowledge. Program a word game in which a player is given a category and has 3 opportunities to guess the correct answer that fits in the category. Each guess is compared to the correct answer, which is kept hidden from the player. The comparison is done using a metric called shortest edit distance, the number of insert/substitute/delete operations needed to change one word into another.

Use dynamic programming to compute the **shortest edit distance** between two words of type `String`.

After each guess, the score is updated with the distance. If the guess is incorrect, the distance from the correct answer is displayed to the player. If a guess is correct, or 3 incorrect answers have been given, move on to the next round. The game should take place over 10 rounds with categories and examples of your choosing. To win the game, a pointless (0) score is needed in each round. The final score must be written to a file called `user.txt` where `user` corresponds to the player alias/username.

The following example uses a simple console interface and should guide your solution:

```
Round 1: animal

    Answer 1: dog
    incorrect -> 4

    Answer 2: monkey
    incorrect -> 3

    Answer 3: mouse
    correct
```

The correct answer for Round 1 is "mouse". The shortest edit distance between "mouse" and "dog" is 3. To transform "mouse" into "dog", the first and third letters need to be substituted ("m" replaced by "d" and "u" replaced with "g". Two letters ("s" and "e") need to be deleted. This gives a distance of 4. To transform "mouse" into "monkey", two substitutions and one insertion must be made. This gives a distance of 3.

Your driver program must be named `Question3.java`.