Tic-Tac-Toe

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1   Introduction

On this project, you will . . .

1.1   Submission

Additional notes:

- Using the naming convention properly is important, failing to do so may be **penalized**.

- **Do not** use Turkish characters when naming files or folders.

- Submissions with unidentifiable names will be **disregarded** completely. (ex. "homework1", "project" etc.)

- Please write your name into the Java source file where it is asked for.

1.2   Academic Honesty

Koç University's *Statement on Academic Honesty* holds for all the homeworks given in this course. Failing to comply with the statement will be penalized accordingly. If you are unsure whether your action violates the code of conduct, please consult with your instructor.

1.3   Aim of the Project

In your homework assignments, the **functionality** and **style** of your programs are **both important.** A program that "works" is not necessarily a good program. A good program is **comprehensible, readable and well structured.** Therefore you're expected to do **"Stepwise Refinement"** to decompose the main problem into simpler subtasks and **implement helper methods** for these subtasks. You're also expected to write comments if needed, be careful about indentation and use descriptive names for helper methods. Even if your program functions well according to the project requirements, you may not be able to get full credit if the style of your code has problems.

1.4   Given Code

This part is **optional** but advised as it will allow you to understand the given partitions of the code better. **Do not** change anything in the code if it is indicated to you with a comment. The code given to you has something called **JavaDoc** comments above all the methods. These comments allow you to view various information about the method when you mouse over the name of the method. Below are the methods given to you in the code with their explanation.

1.4.1   Given Methods

- void playThemeSong (String fileLocation)

  Plays the original **"Overworld Theme"** of Nintendo's **Super Mario Bros.** game.

- void playVictorySong (String fileLocation)

  Plays the original **"Victory Theme"** of **Super Mario Bros.** game.

1.4.2   Given Constants

Two constants, i.e THEME_SONG and VICTORY_SONG, are given at the bottom of the project. You will use this constants as **arguments** for given methods. Since you did not learn methods in detail yet, **we will provide necessary code in corresponding sections of the project.**

1.5   Further Questions

For further questions **about the project** you may contact **Hasan Can Aslan** at [haslan16@ku.edu.tr]. Note that it may take up to 24 hours before you receive a response so please ask your questions **before** it is too late. No questions will be answered when there is **less than two days** left for the submission.

2 Given Worlds

There are two worlds available to you in project to test your code. However, your solution **must be general enough to work on any world with given conditions.**

All of the worlds (two that you are given and **others that will be used for testing your code**) consist of **eight** parts. All of the parts conform to some specific rules. These rules are explained in detail in the following sections.

2.1 Collecting three coins from *"? Blocks"* (15 pts.)

In the beginning of the project, you are encouraged to play the theme song to make yourselves and Karel feel better.

Note: Playing the theme song is **neither mandatory nor graded.** However, you can use the given method (1.4.1) to play the theme song as given below.

playThemeSong (THEME_SONG) ;

Important Note: The second street (the second lowest level) is referred as **ground level** through-out the document.

Rules for Part 1

1. Karel starts the leftmost corner of the ground level, facing East.

2. The corner at the intersection of the column of the first coin and ground level is painted WHITE.

3. Shape of the part with length five is always as shown in the images of Figure 2 (altering between bricks and coins).

2.2 Pipes (15 pts.)

After Karel passed the ? Blocks, he will encounter two pipes. Karel needs to climb to the first pipe and jump to the second pipe while collecting all the coins (or in his world beepers) between them.

Rules for Part 2:

1. Pipes can have any length.

2. Coins are arranged in a rectangular order.

3. There is at least one empty corner between the highest coin and the ceiling.

2.3 Bricks (15 pts.)

On this part, Karel needs to jump over two bricks to continue his adventure.

Rules for Part 3:

1. Bricks can have any length, however, they are always one corner thick.

2. Karel knows that **second brick is always higher than the first brick.**

3. First brick always starts at **one corner east from lava's column**.

4. Lava is not covered with a wall. Karel can't directly dive into lava, however, he **can visit even lava's neighbor corners** without getting hurt.

2.4 Downstairs (15 pts.)

On this part, Karel needs to climb to the top of stairs and then descend.

Rules for Part 4

1. Stairs can be at any height.

2. Stairs always descend by one at each step.

2.5 Coin On Top (5 pts.)

After descending from stairs, Karel needs to climb to the pipe and collect the coin on top of it.

Rules for Part 5

1. The pipe can be at any height.

2. There is at least **two empty corners between downstairs and the pipe.**

2.6 Upstairs (15 pts.)

Rules for Part 6

1. Stairs can be at any height.

2. Stairs always ascend by one at each step.

2.7   ”Flagpole” (15 pts.)

On this part, Karel needs to ascend to the flag,
and then lower it step by step.

Important: You have to animate this by **picking/putting beepers and painting corners** as shown below.

Rules for Part 7

1. Flagpole is always in between two bricks and it starts from one corner above bricks.

2. The flagpole can have any length.

3. There is at least one empty corner between top of of the flagpole and ceiling.

2.8   Walk to Victory! (5 pts.)

Congratulations! You are just a few steps away from victory. Karel needs to find the castle's door and go there. After Karel arrived to door, i.e. finished the level, you must play the Victory Theme by using given method as given below:

playVictorySong(VICTORY_SONG);

Hint: The door has the color **DARK_GRAY**.

2.9   End of Project

Your project ends here. You may continue to tinker with the code to implement any desired features and discuss them with your section leader. However, **do not** include any additional features that you implement after this point in to your submission.

Final Warning: Do not include anything beyond this point to your submission. Points may be deducted from your grade as additions might alter the normal behavior of your code.