Project #2
Single Player Boggle Challenge

CS 351

Game Description

Boggle is a simple word game that helps one expand his/her vocabulary and the ability to rapidly recognize words. It is easy to learn and play, but also challenging—especially for someone who is not a native English speaker. Any number of people can play at the same time. Here are the basic rules:

- The game is usually played with 4x4 or 5x5 tray that holds dice, which display letters on all sides.
- The game starts by shaking the dice (with the lid on) until they fall into place inside the tray.
- A three-minute timer is started.
- Each player writes on a piece of paper words he/she sees on the tray, as fast as possible.
- The game stops when the timer expires.
- The player gets point only for words that
  - are visible on the tray
  - are listed in the dictionary
  - are not capitalized or foreign words
  - do not appear on any other player's list
  - are at least three-letter long
- There is no penalty for rejected words.
- Distinct words can use the same dice in the tray, e.g., "home," "homes," and "homed" might all appear in the tray.
- The number of points received for a given word equals the length of the word minus two, e.g., 1 point for "dog," 2 points for "lava," and 4 points for "retina."
- A word appears on the tray if
  - it consists of a string of letters that is formed by traversing neighboring dice without stepping on the same dice twice.

Illustration

Consider the tray configuration below:

- legal words:
  - get, set, song, net, ten, tens, wet, new, newt.
- unacceptable words:
  - gone — not contiguous
  - songs — "s" was used twice from the same dice
  - when — there is no "h" on the tray

Assignment

- Write a Java program that implements a single-player version of Boggle.
- Use a 5x5 tray whose contents is generated at random each time.
- When the letter Q is placed on the tray, increase the probability that an instance of the letter U appears next to it.
- No letter may appear more than 4 times in the tray.
- Use the list of words provided to you in the lab in place of a dictionary.
- Display
  - the tray
  - the remaining time to play
  - the list of words selected by the player with unacceptable ones being rendered in red
  - the current score

Special Instructions

- The solution must be a sequential program. Do not use a multithreaded design.
- The design must be object oriented, highly modular, and amenable to change.
- The program must be built incrementally and all versions of the program must be submitted for grading:
  - Version 1: allow the player to type a word and check that it is in your dictionary.
  - Version 2: generate and display the tray, allow the player to type single words, and check that the words are valid with respect to the tray contents.
  - Version 3: generate a first complete game, but continue to allow the player to type words on the keyboard.
  - Version 4: modify the code so as to allow the user to select letters on the screen and to see what was selected as in the example below.