CME1212 Algorithms and Programming II
Homework 4

Upload your source code files from *DEUZEM SAKAI* until **30 May 2021, 23:55.**

Write a Java program for a simple version of the ***"Wheel of Fortune"*** **(Çarkıfelek)** game. Please keep in mind that the official "*Wheel of Fortune*" rules and instructions are different depending on the game version you will implement.

The main aim of the game is to solve the word puzzle and gain money as you can.

Description About the Game
There is only one player.

The game is played with a special wheel that determines the dollar value of the called letters. The wheel is split into 10 segments as follows: 10, 20, 30, 40, 100, 200, 300, 400, Bankrupt, and Bankrupt.

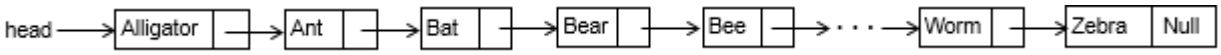
The computer randomly determines a word and then a player tries to guess it by suggesting letters. The word should be an animal in English such as dog, cat, chicken, penguin, etc.

The letters of the hidden word represented by tiles are face down. A player spins the wheel by naming the letters one-by-one to solve the puzzle. Both consonants and vowels can be guessed by the player after spinning the wheel. If the player guesses a letter that is part of the word, the computer writes it in all its correct positions. If the called letter cannot be found in the word, the player cannot earn any money from this turn.

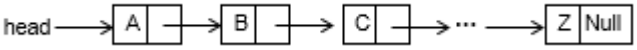
Before guessing a letter, a player must spin the wheel to determine how much each letter, if revealed. Every spin is risky because the wheel also includes bankrupt, resulting in the loss of all earnings to that point.

The game is over when the player completes the whole word correctly. The player gets the money he/she earns.

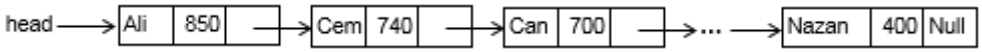
Initially
Read the unsorted file "D:*animals.txt*" and then create a **Single Linked List (SLL1)**, which is sorted alphabetically, as follows:



Add all letters in a **Single Linked List (SLL2)**.



Read the unsorted file "D:*HighScoreTable.txt*" and create a sorted **Single Linked List (SLL3)** as follows:



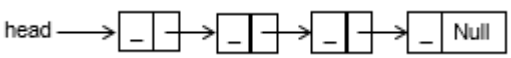
Pelin
530
Kaan
550
Ali
850
Yeliz
650
Cem
740
Can
700
Ece
500
Sibel
680
Remzi
620
Nazan
400

The Beginning of the Game
Generate a random number (x), print this number on the screen, and get x^{th} word of SLL1.
For example; if the randomly generated number is 4, the animal "*BEAR*" is selected from the animal list.

Store this word in a **Single Link List (SLL4)**.
In addition to SLL4, create an empty Single Linked List, named **SLL5**, for the game board.

Example:

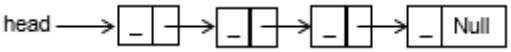
SLL4 

SLL5 

Game Playing
The game board (SLL5) must be seen on the screen, permanently.
The program should randomly select a letter from SLL2. After that, the letter should be deleted from SLL2.

If the selected letter does not exist in SLL4, the player does not earn anything in this step.
If the user suggests a letter that exists in SLL4, the computer writes it in all its correct positions in SLL5.

For example;
If the selected letter is "*E*", then the SLL5 should be as follows:

SLL5 Before 

After 

The program must display all steps until the game is over. In other words, the program must repeatedly print SLL5, the current step, the score, and the remaining letters (SLL2) on the screen.

Scoring
If the guess is correct, then a prize according to the wheel segment is paid. The amount in the wheel segment is multiplied by the number of times that the letter appears in the word.

End of the Game
The game is over when the player completes the whole word correctly.

High Score Table
If the player earns a score within the top-10 results, he/she will be displayed in the High-Score table.
Add into SLL3. If the same score exists in the table, the new score should be inserted to the next of them. Delete the last record.
The new score table should be written to the file ("D:*HighScoreTable.txt*").

Don't take any input from the user !!!

This homework will be graded by Res.Asst.Dr. Göksu TÜYSÜZOĞLU.
You can ask your questions her from the "**FORUM → Homework 4 - Questions**" part of the *DEUZEM SAKAI* software.

Sample output:

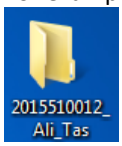
```
Randomly generated number: 5

Word:  - - -                Step:  1      Score: 0            ABCDEFGHIJKLMNOPQRSTUVWXYZ
Wheel: 400
Guess: E
Word:  - E E                Step:  2      Score: 800          ABCDFGHIJKLMNOPQRSTUVWXYZ
Wheel: 10
Guess: R
Word:  - E E                Step:  3      Score: 800          ABCDFGHIJKLMNOPQSTUVWXYZ
Wheel: 40
Guess: A
Word:  - E E                Step:  4      Score: 800          BCDFGHIJKLMNOPQSTUVWXYZ
Wheel: 100
Guess: S
Word:  - E E                Step:  5      Score: 800          BCDFGHIJKLMNOPQTUVWXYZ
Wheel: 30
Guess: B
Word:  B E E                Step:  6      Score: 830          CDFGHIJKLMNOPQTUVWXYZ

You get 830 TL !!!

High Score Table
Ali 850
You 830
Cem 740
Can 700
...
Ece 500
```

Notes

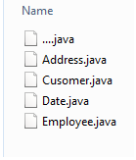
1- In your program, you can use Single Linked List (SLL) as you want, but you must use only SLL.
Don't use other data structures such as an array, arraylist, Java embedded linked list, stack, queue, DLL, CLL, or MLL.
Don't use STRING data type in the main solution, instead of SLL.

2- Upload format

Step1: Create a new folder, named by your student number and name (without any space)
For example: 2015510012_Ali_Tas



Step2: Copy all java files into this folder



Step3: Compress the folder **2015510012_Ali_Tas.zip**

Step4: Upload the file **2015510012_Ali_Tas.zip** from *DEUZEM SAKAI*

3- Don't use **ENIGMA** or any other extra library.

4- If you are late, your grade will be decreased by 10 points for each day. After five days, your assignment will not be accepted.

5- Assignment must be your individual work.
Cheating is strictly prohibited.
All source codes will be automatically compared with each other by using a program.
If any cheating occurs, your assignment will be graded with **zero (0)**.

6- Your program must work correctly under all conditions. Try to control all possible errors.

7- You should use meaningful variable names, appropriate comments, and good prompting messages.