Project 02: Word game

Let's begin by describing the word game: This game is a lot like Scrabble or Words with Friends, if you've played those. Letters are dealt to players, who then construct one or more words out of their letters. Each **valid** word receives a score, based on the length of the word and the letters in that word.

The rules of the game are as follows:

**Dealing**

* A player is dealt a hand of *n* letters chosen at random (assume *n=7* for now).
* The player arranges the hand into as many words as they want out of the letters, using each letter at most once.
* Some letters may remain unused (these won't be scored).

**Scoring**

* The score for the hand is the sum of the scores for each word formed.
* The score for a word is the sum of the points for letters in the word, multiplied by the length of the word, plus 50 points if all *n* letters are used on the first word created.
* Letters are scored as in Scrabble; A is worth 1, B is worth 3, C is worth 3, D is worth 2, E is worth 1, and so on. We have defined the dictionary SCRABBLE\_LETTER\_VALUES that maps each lowercase letter to its Scrabble letter value.
* For example, 'weed' would be worth 32 points ((4+1+1+2) for the four letters, then multiply by len('weed') to get (4+1+1+2)\*4 = 32). Be sure to check that the hand actually has 1 'w', 2 'e's, and 1 'd' before scoring the word!
* As another example, if *n*=7 and you make the word 'waybill' on the first try, it would be worth 155 points (the base score for 'waybill' is (4+1+4+3+1+1+1)\*7=105, plus an additional 50 point bonus for using all *n* letters).

**Sample Output**

Here is how the game output will look!

Loading word list from file...

83667 words loaded.

Enter n to deal a new hand, r to replay the last hand, or e to end game: n

Current Hand: p z u t t t o

Enter word, or a "." to indicate that you are finished: tot

"tot" earned 9 points. Total: 9 points

Current Hand: p z u t

Enter word, or a "." to indicate that you are finished: .

Total score: 9 points.

Enter n to deal a new hand, r to replay the last hand, or e to end game: r

Current Hand: p z u t t t o

Enter word, or a "." to indicate that you are finished: top

"top" earned 15 points. Total: 15 points

Current Hand: z u t t

Enter word, or a "." to indicate that you are finished: tu

That is not a valid word. Please choose another word

Current Hand: z u t t

Enter word, or a "." to indicate that you are finished: .

Total score: 15 points.

Enter n to deal a new hand, r to replay the last hand, or e to end game: n

Current Hand: a q w f f i p

Enter word, or a "." to indicate that you are finished: paw

"paw" earned 24 points. Total: 24 points

Current Hand: q f f i

Enter word, or a "." to indicate that you are finished: qi

"qi" earned 22 points. Total: 46 points

Current Hand: f f

Enter word, or a "." to indicate that you are finished: .

Total score: 46 points.

Enter n to deal a new hand, r to replay the last hand, or e to end game: n

Current Hand: a r e t i i n

Enter word, or a "." to indicate that you are finished: inertia

"inertia" earned 99 points. Total: 99 points

Run out of letters. Total score: 99 points.

Enter n to deal a new hand, r to replay the last hand, or e to end game: e

Important:

This project must be structured so that you will write a number of modular functions and then glue them together to form the complete word playing game. Instead of waiting until the entire game is ready, you should test each function you write, individually, before moving on. This approach is known as unit testing, and it will help you debug your code. This approach is fundamental for project maintenance and modularity.

One of your team members must be responsible for unit testing. This person must implement tests in order to validate the project specifications. These test functions must simulate function calls and compare return results with expected results from specification.

Within this project your team must provide:

1. List of team and their corresponding tasks.
2. Project model (relationship of all functions) Sample is provided inside same folder as GraphicalModel.png file.
3. Project plan (list of all activities with short description)
4. Work breakdown (Distribution of tasks among team members. Try to reason why the task was given to specific person instead of some other team member).
5. Project Schedule with deadlines and milestones.
6. Analyze of results (Did all specifications were met by the end of the project?)
7. Submission folder must contain report of each team member prepared by him / her self. Report must reflect his / her work done. One paragraph of personal project experience.
8. Prototype of the project must be submitted on 24.09.2014 till 10:40 am over [e-course.auca.kg](http://e-course.auca.kg).
9. Final version of project and all related reports must be submitted on 01.10.2014, till 10:40 am.

Note: Source code must contain tests for all functions used inside project.