

# Assignment 3 report

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## 问题描述

这个assignment要求我们实现一个word game。玩家手上拥有若干字母组合，要利用这些字母组合成为一个单词，获得积分。我们所要做的便是实现一个这样的游戏。

## 解题思路

首先，按照文档中的提示一步步来。1.实现函数`get_word_score(word,n)`:此函数计算word可以得到的积分。按照文档中所给的公式进行计算即可。最后只用进行一个比较，若算得的积分小于1，那么将积分置为1，否则，就是计算所得的分值。2.理解函数`get_frequency_dict()`：将字符串转化为字典，映射关系是字母及其频率，`display_hand()`：将hand展示出来，`deal_hand()`：随机生成一个hand，实现函数`update_hand()`：将玩家所用过的字母从hand中移除，遍历word中的每一个字母，每一次将hand中相对应的频率减一。减到0的时候将它从hand中移除。3.实现函数`valid_word()`：判断一个单词是否合法。将输入的单词转化为dict，一项项对比相对应的字母在word中以及在hand中的频率，若出现大于的情况，就为False。这是判断的第一步，看看输入的单词是否能由hand组成。接下来判断它是否在列表中。先判断不带星号的情况。接下来判断带有星号的情况，将星号的位置替换为元音，一个个判断是否在wordlist里面。4.实现函数`play_hand()`使用一个hand来进行游戏，按照伪代码所给的提示一步步进行。使用一个变量`total_score`来存储分值，使用`display_hand()`函数来展示目前hand中的内容，接下来收取用户输入，检查是否合法的单词，若合法，则对应加分，并将得分情况打印出来给用户。然后将用户用过的字母从hand中移除，使用`update_hand()`函数。直到用户主动结束游戏或者hand中没有字母了结束游戏。函数返回`total_score`值。5.实现函数`substitute_hand()`，将hand中的一个字母替换为hand中不存在的另一个字母，使用随机选取字母。这里用元音替换元音，辅音替换辅音。6.实现`play_game()`函数。此函数先读入hand的总个数，接着进入循环，循环hand的个数次。在循环体内先问用户是否要替换掉一个字母，接着调用单独的`play_hand()`函数，来实现这个hand的游戏。最后游戏结束时，输出总分值。

## 运行截图

```
PS C:\coding\Python\p3-17340027-姚洁倩> python .\ps3.py
Loading word list from file...
83667 words loaded.
Enter total number of hands:3
Current hand:
a a u r r k w l p *
Would you like to substitute a letter?yes
Which letter would you like to replace:r
Current hand: a a u k w l p * h h
Enter word, or "!!" to indicate that you are finished:hawk
hawk earn 140 points. Total: 140 points
Current hand: a u l p * h
Enter word, or "!!" to indicate that you are finished:haul
haul earn 154 points. Total: 294 points
Current hand: p *
Enter word, or "!!" to indicate that you are finished:p*
p* earn 42 points. Total: 336 points
Run out of letters. Total score for this hand: 336 points.
-----
Current hand:
a o i g x x p k d *
Would you like to substitute a letter?no
Current hand: a o i g x x p k d *
Enter word, or "!!" to indicate that you are finished:diag
That is not a valid word. Please choose another word.
Current hand: o x x p k *
Enter word, or "!!" to indicate that you are finished:xpk
That is not a valid word. Please choose another word.
Current hand: o x *
Enter word, or "!!" to indicate that you are finished:xo*
That is not a valid word. Please choose another word.
Run out of letters. Total score for this hand: 0 points.
-----
Current hand:
o u e l p w f n t *
Would you like to substitute a letter?no
Current hand: o u e l p w f n t *
Enter word, or "!!" to indicate that you are finished:fuel
fuel earn 70 points. Total: 70 points
Current hand: o p w n t *
Enter word, or "!!" to indicate that you are finished:town
town earn 154 points. Total: 224 points
Current hand: p *
Enter word, or "!!" to indicate that you are finished:p*
p* earn 42 points. Total: 266 points
Run out of letters. Total score for this hand: 266 points.
-----
Total score over all hands: 602
```

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## 一些极端测例

- 输入为空

```
Current hand: e e i c l l n x p *  
Enter word, or "!!" to indicate that you are finished:*****  
That is not a valid word. Please choose another word.
```

- 输入为全部的星号

```
Current hand: e e i c l l n x p  
Enter word, or "!!" to indicate that you are finished:  
That is not a valid word. Please choose another word.
```

## 遇到的困难及解决方案

- 在实现is\_valid\_word () 函数的时候，一开始没有将字符串转化为字典的意识，直接就迭代word里面的每一个字母，然后再在hand中看有没有这个并更新hand的值。后来发现要求hand的值不能修改，便将word也转化为字典，对应字母和它们的频率，一个个与hand中的比较。
- 另外在加入了wildcard之后的此函数，开始时没弄明白这个要怎么判断，后面使用的方法是对word原本为星号的为止进行替换，一个个元音试，看它是否在wordlist里面