Smarter and simple Scrabble strategy

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Sammanfattning

Scrabble

Contents

a successful player, some knowledge about how many tiles of each letter is available is preferable.

When playing, the ability to keep a good balance between consonants and

Chapter 2

Background

2.1 Scrabble game rules

a 15x15 board with bonus squares and the center marked out. See gure 2.1.

a set of letter tiles

The players are given 5-8 tiles each to keep on their *rack*. Each letter reward points. Letters that are frequent in the language give lower score,

Bonus squares

There are four di erent types of *bonus squares* dispersed throughout the board. The following bonus types can be used.

- 2L: Double letter
- 3L: Triple letter
- 2W: Double word
- 3W: Triple word

by nding cases where two or more words can share a common letter (node). A new edge is then created from the previous node in one of the words to the other words node. Finally, the unnecessary edge and node are removed.

beseeninthe gure2.4. Theseareimportantsincewordscanonly be extended from already existing tiles. In the rst move of the game there is only one anchor; the center square, since the word in the rst turn always has to be placed over the center square.

Figure 2.4: Anchor squares. The adjacent tiles are the anchor tiles from

Chapter 3

Implementation

```
for each letter in inputMove.word
        squareBonus <  bonus for letter.square;
        if squareBonus greater than bonus
                bonus <  squareBonus;
        end if
```

Chapter 4

Results

Each of the agents has been tested against the others, to allow evaluation of the impact of each strategy. Explanations of the agents can be read about in section 3.2.

Section 4.1 describes under which conditions the tests were made.

Sections 4.2, 4.3 and 4.4 show the results from each run.

4.1 Test conditions

The BOR player has an ideal ratio between the tiles on the rack which it tries to keep throughout the game. The ratio will oFTd [(4.rerr(tesies)-298(to)a(tries)-4252326d

the Swedish dictionary. Ths size of the small dictionary is 83247 words. The second is the large dictionary, which includes all possible in ections of each word making it as large as 480 391 words.

wins 8% more games with the large dictionary than with the small. The results from 10 000 games can be seen in gure 4.1.

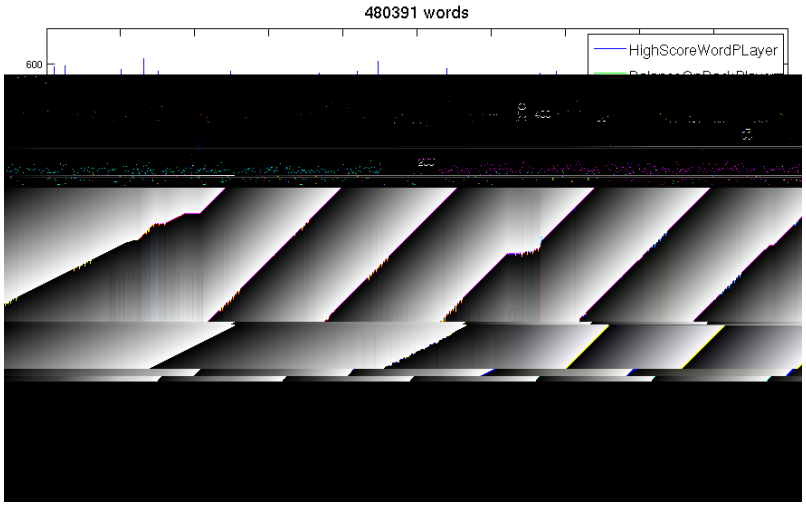
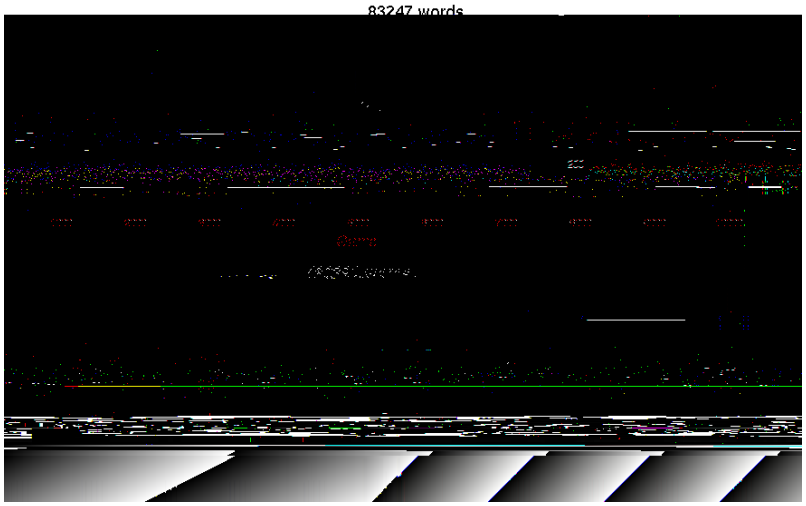


Figure 4.1: Scores with a BOR vowel ratio 8/8. The game scores from the HSW player and BOR player in 10000 games

4.3 Balance On Rack vs Bonus Squares

The BOR player shows a poor performance also against the BS player, with a best case of 9% winnings. Table 4.2 shows that the vowel ratio of 8/8 gives


83247 words

Chapter 5

Conclusions

5.1 Discussions

The reason for the negative scores can be due to an impossible situation from the start. The agents were for example given only consonants that cannot form a word, or only di cult tiles. This would result a situation where none of the players being able to place a word, and the game eventually ends. The sum of the letter scores on the rack is then subtracted, and it is the only way a player could get a negative score.

BOR player

Appendix A

Tables

A.1 High Score Words vs Balance On Rack

	BOR	HSW
Wins	1206	8762
Draws	32	32

	BOR	BS
Wins	172	9818
Draws	10	10
Wins when started playing	97	4930

Bibliography

[1] Sheppard, B., 2002, Towards Perfect Play of Scrabble, Maastricht.