

# Scrapple.java

**Objective:** To use strings to play a game.

## Background:

Scrabble is a popular word game challenging players to create words from letter tiles on a two-dimensional board. Each letter tile is assigned points and the objective is to form high point total words with the tiles. There are a limited set of letter tiles and the game ends when no more words can be formed by a player's tiles.

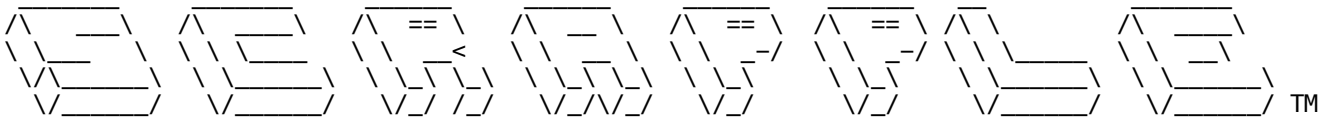
Scrapple follows the same objective but without the board. Players are given letter tiles and each player must spell words with those tiles to score points. The game is played until no more words can be spelled. The player with the most points wins.

## Assignment:

We wrote **WordUtils.java** that provides many helper methods for the Scrabble game. Write the game Scrapple and pit the user against the computer. You start with a pool of tiles and each player randomly gets eight tiles from that pool. As tiles are selected, the pool gets smaller. The players can only form words of length 4 to 8 letters, they must match a word in the file "wordList.txt", and they must match the user's tiles. The word score doubles if the word has consecutive double letters, like "ballet". The computer always picks the highest scoring 4 to 8 letter word using its tiles. The game ends when no words can be formed from the remaining tiles of a player.

Here is a sample run output:

```
% java Scrapple
```



This game is a modified version of Scrabble. The game starts with a pool of letter tiles, with the following group of 100 tiles:

```
A A A A A A A A A B B C C D D D D E E E E E E E E E E F F G G G H H I I I I I I I I I J K L  
L L L M M N N N N N N O O O O O O O P P Q R R R R R R S S S S T T T T T T U U U U V V W W X Y Y Z
```

The game starts with 8 tiles being chosen at random to fill the player's hand. The player must then create a valid word, with a length from 4 to 8 letters, from the tiles in his/her hand. The "word" entered by the player is then checked. It is first checked for length, then checked to make sure it is made up of letters from the letters in the current hand, and then it is checked against the words in the dictionary. If any of these tests fail, the game terminates. If the word is valid, points are added to the player's score according to the following table (These scores are taken from the game of Scrabble):

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	3	3	2	1	4	2	4	1	8	5	1	3	1	1	3	10	1	1	1	1	4	4	8	4	10

The score is doubled (BONUS) if the word has consecutive double letters (e.g. ball).

Once the player's score has been updated, more tiles are chosen at random from the remaining pool of letters, to fill the player's hand to 8 letters. The player again creates a word, and the process continues. The game ends when the player enters an invalid word, or the letters in the player's or computer's hand cannot form a valid word. Ready? Let's play!

HIT ENTER on the keyboard to continue: ->

Here are the tiles remaining in the pool of letters:

A A A A A A A A A B B C D D D E E E E  
E E E E E E E F G G H H I I I I I I  
I J L L M M N N N N N O O O O O O P P  
Q R R R R R S S S T T T T T T U U U V W  
X Y Y Z

Player Score: 0  
Computer Score: 0

THE TILES IN YOUR HAND ARE: W E K D G V C O

THE TILES IN THE COMPUTER HAND ARE: L F U I L N R S

Please enter a word created from your current set of tiles -> **weck**

Here are the tiles remaining in the pool of letters:

A A A A A A A A A B C D D D E E E E E E  
E E E E E E F G G H H I I I I I I I I J  
L L M M N N N N N O O O O O O P P Q R  
R R R R S S S T T T T T T U U V W X Y Y

Player Score: 13  
Computer Score: 0

THE TILES IN YOUR HAND ARE: D G V O Z A U B

THE TILES IN THE COMPUTER HAND ARE: L F U I L N R S

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: SINFUL

Here are the tiles remaining in the pool of letters:

A A A A A A A A A B C D D D E E E E E E  
E E E E E E F H H I I I I I I I I L L M  
M N N N N N O O O O O O P P Q R R R R R  
S S T T T T T U U V W X Y Y

Player Score: 13  
Computer Score: 9

THE TILES IN YOUR HAND ARE: D G V O Z A U B

THE TILES IN THE COMPUTER HAND ARE: L R J O T G S G

Please enter a word created from your current set of tiles -> **gouda**

Here are the tiles remaining in the pool of letters:

A A A A A A A A A B C D D D E E E E E E  
E E E E F H I I I I I I I I L L M M N N  
N N O O O O O O P P Q R R R R R S S T T  
T T T U V W X Y Y

Player Score: 20  
Computer Score: 9

THE TILES IN YOUR HAND ARE: V Z B N E U H A

THE TILES IN THE COMPUTER HAND ARE: L R J O T G S G

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: GLOST

Here are the tiles remaining in the pool of letters:

A A A A A A A B C D D E E E E E E E E  
E E F H I I I I I I I L L M M N N N N O  
O O O O P P Q R R R R R S S T T T T U  
V W Y Y

Player Score: 20  
Computer Score: 15

THE TILES IN YOUR HAND ARE: V Z B N E U H A

THE TILES IN THE COMPUTER HAND ARE: R J G T I E D X

Please enter a word created from your current set of tiles -> **buaze**

Here are the tiles remaining in the pool of letters:

A A A A A A A B C D D E E E E E E E E  
E H I I I I I I I L M M N N N O O O O O  
P P Q R R R R R S S T T T T U V W Y Y

Player Score: 36  
Computer Score: 15

THE TILES IN YOUR HAND ARE: V N H L F O N E

THE TILES IN THE COMPUTER HAND ARE: R J G T I E D X

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: JERID

Here are the tiles remaining in the pool of letters:

A A A A A A A B C D D E E E E E E E E H  
I I I I I I L M M N N N O O O O O P P Q  
R R R R R S S T T T T U W Y

Player Score: 36  
Computer Score: 28

THE TILES IN YOUR HAND ARE: V N H L F O N E

THE TILES IN THE COMPUTER HAND ARE: G T X A E I Y V

Please enter a word created from your current set of tiles -> **foehn**

Here are the tiles remaining in the pool of letters:

A A A A A A A B C D D E E E E E E E E H  
I I I I L M M N N O O O O O P P Q R R R  
R S S T T T U W Y

Player Score: 47  
Computer Score: 28

THE TILES IN YOUR HAND ARE: V L N I R N I T

THE TILES IN THE COMPUTER HAND ARE: G T X A E I Y V

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: AXITE

Here are the tiles remaining in the pool of letters:

A A A A A A B C D E E E E E E E I I I I  
L M M N N O O O O P P Q R R R R S S T T  
T U W Y

Player Score: 47  
Computer Score: 40

THE TILES IN YOUR HAND ARE: V L N I R N I T

THE TILES IN THE COMPUTER HAND ARE: G Y V E A H D O

Please enter a word created from your current set of tiles -> **vint**

Here are the tiles remaining in the pool of letters:

A A A A A B C D E E E E E E E I I L M N  
N O O O O P P Q R R R R S S T T T U W Y

Player Score: 54

Computer Score: 40

THE TILES IN YOUR HAND ARE: L R N I A I I M

THE TILES IN THE COMPUTER HAND ARE: G Y V E A H D O

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: HEAVY

Here are the tiles remaining in the pool of letters:

A A A A A B C D E E E E E E I L M N N O  
O O P P Q R R R S S T T T U Y

Player Score: 54

Computer Score: 54

THE TILES IN YOUR HAND ARE: L R N I A I I M

THE TILES IN THE COMPUTER HAND ARE: G D O W R E O I

Please enter a word created from your current set of tiles -> **marlin**

Here are the tiles remaining in the pool of letters:

A A A A B D E E E E E E I L M N N O O O  
P R R R S T T U Y

Player Score: 62

Computer Score: 54

THE TILES IN YOUR HAND ARE: I I T C Q S A P

THE TILES IN THE COMPUTER HAND ARE: G D O W R E O I

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: WEIRDO

Here are the tiles remaining in the pool of letters:

A A B D E E E E E I L M N O O O P R R R S  
T T U

Player Score: 62

Computer Score: 64

THE TILES IN YOUR HAND ARE: I I T C Q S A P

THE TILES IN THE COMPUTER HAND ARE: G O N Y A E A E

Please enter a word created from your current set of tiles -> **stipa**

Here are the tiles remaining in the pool of letters:

A A B D E E E E I L N O O P R R R S

Player Score: 69  
Computer Score: 64

THE TILES IN YOUR HAND ARE: I C Q U M T T O

THE TILES IN THE COMPUTER HAND ARE: G O N Y A E A E

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: AGONY

Here are the tiles remaining in the pool of letters:

A A B D E E L N O O P R R

Player Score: 69  
Computer Score: 73

THE TILES IN YOUR HAND ARE: I C Q U M T T O

THE TILES IN THE COMPUTER HAND ARE: E A E R S I E E

Please enter a word created from your current set of tiles -> **quin**

Here are the tiles remaining in the pool of letters:

A A B D E N O P R

Player Score: 84  
Computer Score: 73

THE TILES IN YOUR HAND ARE: C T T O L O R E

THE TILES IN THE COMPUTER HAND ARE: E A E R S I E E

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: AERIE

Here are the tiles remaining in the pool of letters:

D N O R

Player Score: 84  
Computer Score: 78

THE TILES IN YOUR HAND ARE: C T T O L O R E

THE TILES IN THE COMPUTER HAND ARE: S E E B A A P E

Please enter a word created from your current set of tiles -> **clotter**  
BONUS WORD SCORE!!!

Here are the tiles remaining in the pool of letters:

Player Score: 102  
Computer Score: 78

THE TILES IN YOUR HAND ARE: O O D N R

THE TILES IN THE COMPUTER HAND ARE: S E E B A A P E

It's the computer's turn. Hit ENTER on the keyboard to continue ->

The computer chose: BEEP  
BONUS WORD SCORE!!!

No more words can be created by computer.

THE TILES IN YOUR HAND ARE: O O D N R

THE TILES IN THE COMPUTER HAND ARE: S A A E

Player Score: 102  
Computer Score: 94

Thank you for playing Scrapple!