Concepts Project Report

main/0: First, we started off with the main/0 predicate, which displays a welcome statement, followed by the two main phases of the game: build_kb/0 and play/0.

build_kb/0: This predicate prompts the user to enter the word and its category, and asserts them into the knowledge base each time using the predefined predicate assert/1 until the first entered word is ‘done’; this is when the predicate will stop and result in true.

is_category(C): This predicate succeeds if C is an available category in the KB.

categories(L): This predicate was supposed to succeed if L is a list containing all the available categories without duplicates, so we used the predefined predicate called setof/3, which gives a sorted form of variables without duplicates.

available_length(L): This predicate was supposed to succeed if there are words in the KB with length L, so we called all the words in the knowledge base, then we used the predefined predicate atom_length/2 on them to return the words with length L.

pick_word(W,L,C): This predicate was supposed to succeed if W is a word in the KB with length L and category C, so we called all the words in the category, then we used the predefined predicate atom_length/2 on them to return the words with length L.

correct_letters(L1,L2,CL): This predicate was supposed to succeed if CL is a list containing the letters in both L1 and L2, so we used the predefined intersection/3 predicate to get the common letters between the entered word and the word the user is supposed to guess, which is located in the knowledge base. However, the method wasn’t supposed to include duplicates, so we created 2 helper methods to remove them: remove_from_set/3 and remove_duplicated/2.

correct_positions(L1,L2,PL): This predicate was supposed to succeed if PL is a list containing the letters that occur in both L1 and L2 in the same positions. Our implementation compares the letters located in the same positions, if the 2 letters are the same, the letter will be added to PL; otherwise, the predicate will move on to the next letter by discarding the previous one recursively until both words have no letters left, which is the base case.

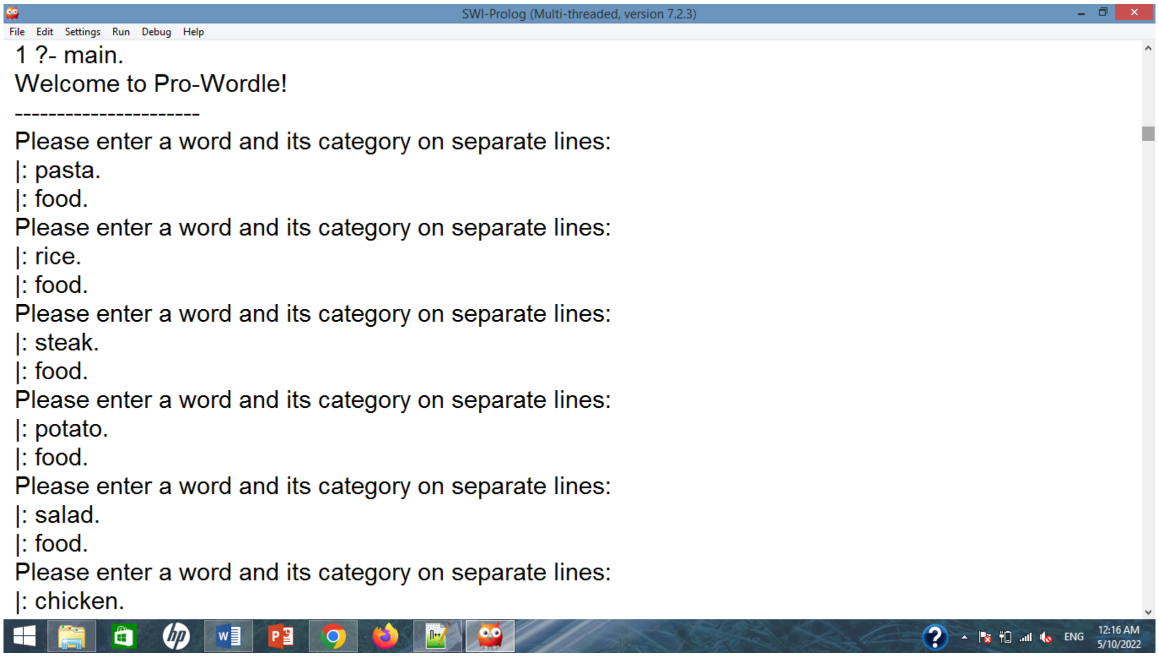
check_category/0: This predicate checks if the category entered by the user is available in the knowledge base using the predicates is_category/1. If the result is true, it passes the category to length_word/1 predicate. If the category doesn't exist, it asks the user to enter another one and the predicate is called recursively.

lengthhelper(W,N,N1,C): This predicate prompts the user to enter a word composed of N letters in attempt to guess the correct word. Then, It takes the entered word and the word in the knowledge base in the chose category and splits them into a list of chars using the predefines predicate atom_chars/2. After that, it compares both lists using the predicates, correct_letters/3 and correct_positions/3, displays the results to the user, decrements the number of guesses. Then, The predicate is called again recursively with the new number of guesses. If the number of guesses reached 0, it prints the "You lost!" to the user, and if the user guessed the word right, it prints "You won!".

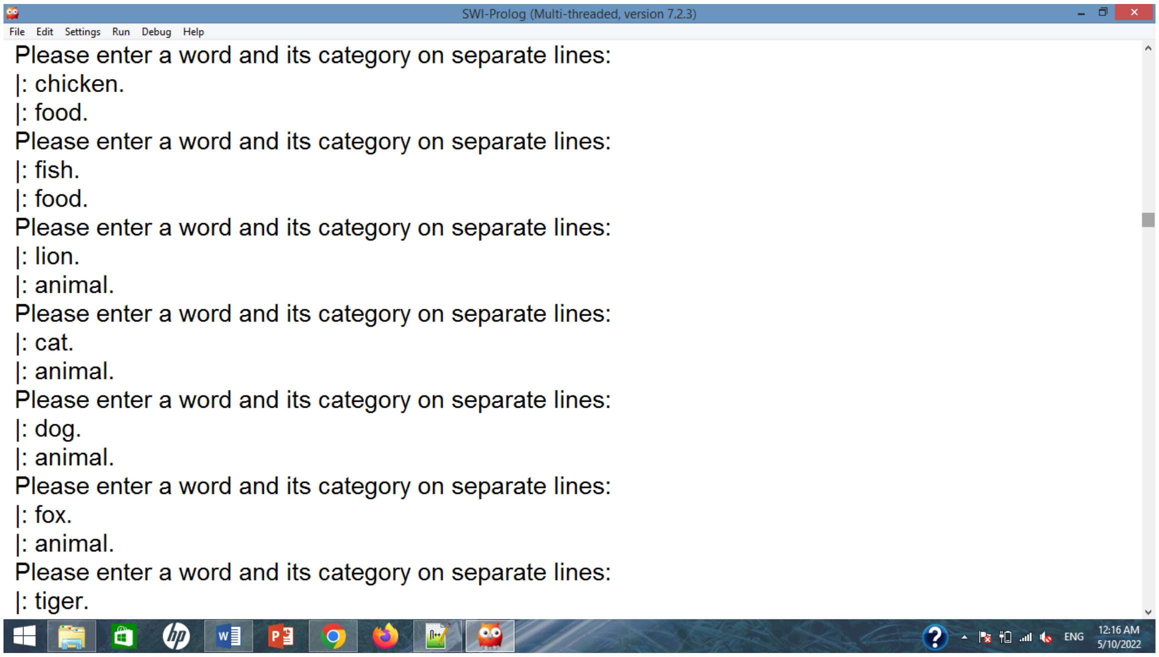
length_word(Category): This is a helper predicate, which prompts the user to choose the length of the word they want to guess. Secondly, it uses the predicate available_length/1 and pick_word/3 to check if there is a word with the desired length in the knowledge base, then it checks if there is a word with the desired length in the chosen category and informs the user that the game started giving them the number of guesses they have, which is the chosen length plus one, and the method lengthhelper/ 4 is called to manage the guesses phase. If there is no word with the indicated length is found, the predicate informs the user that there are no words of this length and the predicate is called recursively until an available length is chosen.

noLettersIn(W,W1,N,N1): This predicate mainly handles the case where the user enters a word with a wrong length. It uses the predefined predicate atom_length/2 to get the length of the word entered by the user and checks if this length and the length chosen previously by the user are the same. If the lengths are not the same, it prompts the user to enter another guess with the same length he chose without decreasing the number of guesses. If the length is correct, the predicate lengthhelper/4 is called.

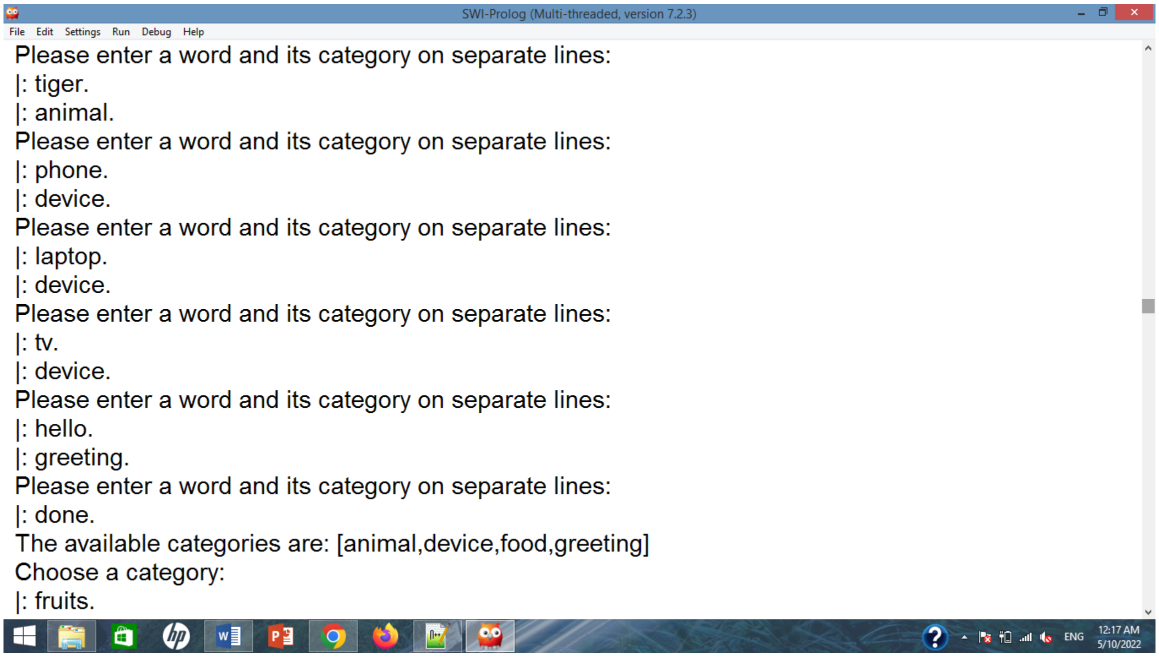
play/0: This predicate tells the user about the available categories, prompts the user to choose one, and checks if the category is available by using the predicate check_category/0.


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
ENG
12:16 AM
5/10/2022

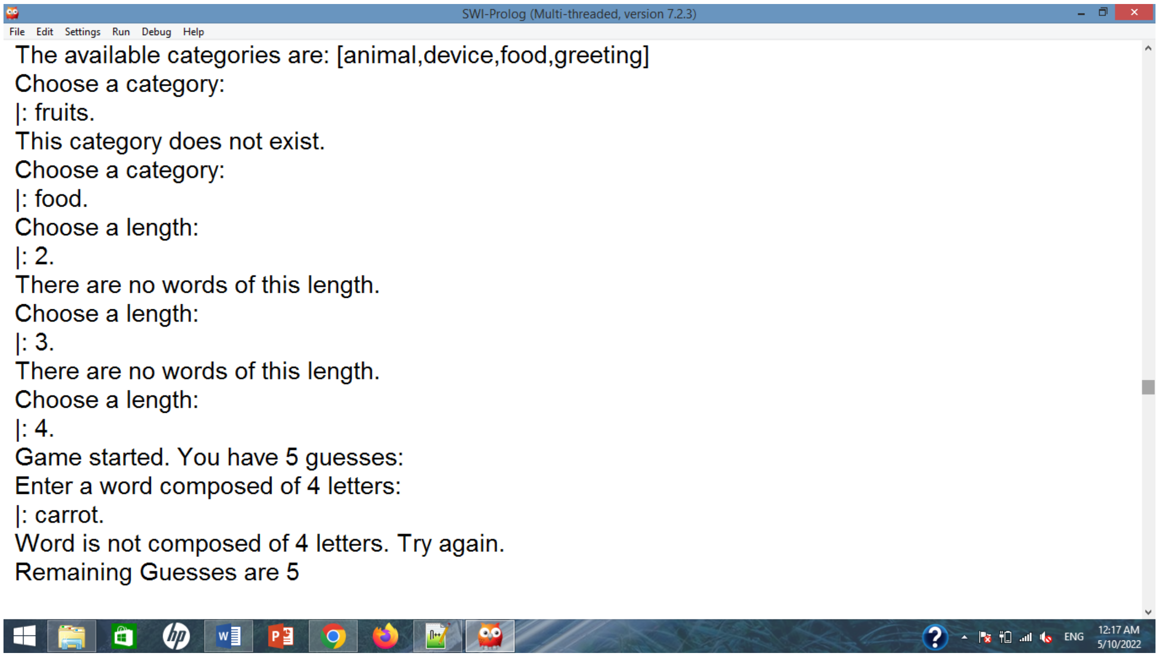
```
1 ?- main.
Welcome to Pro-Wordle!
----------------------
Please enter a word and its category on separate lines:
|: pasta.
|: food.
Please enter a word and its category on separate lines:
|: rice.
|: food.
Please enter a word and its category on separate lines:
|: steak.
|: food.
Please enter a word and its category on separate lines:
|: potato.
|: food.
Please enter a word and its category on separate lines:
|: salad.
|: food.
Please enter a word and its category on separate lines:
|: chicken.
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
ENG
12:16 AM
5/10/2022

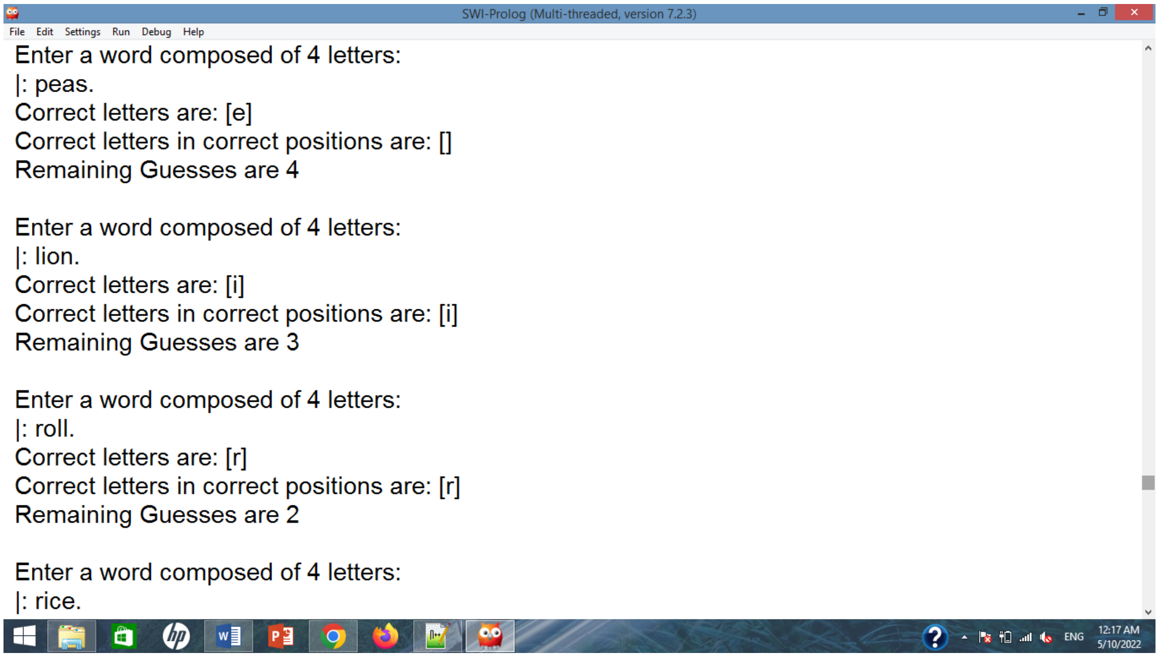
```
Please enter a word and its category on separate lines:
|: chicken.
|: food.
Please enter a word and its category on separate lines:
|: fish.
|: food.
Please enter a word and its category on separate lines:
|: lion.
|: animal.
Please enter a word and its category on separate lines:
|: cat.
|: animal.
Please enter a word and its category on separate lines:
|: dog.
|: animal.
Please enter a word and its category on separate lines:
|: fox.
|: animal.
Please enter a word and its category on separate lines:
|: tiger.
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
ENG
12:17 AM
5/10/2022

```
Please enter a word and its category on separate lines:
|: tiger.
|: animal.
Please enter a word and its category on separate lines:
|: phone.
|: device.
Please enter a word and its category on separate lines:
|: laptop.
|: device.
Please enter a word and its category on separate lines:
|: tv.
|: device.
Please enter a word and its category on separate lines:
|: hello.
|: greeting.
Please enter a word and its category on separate lines:
|: done.
The available categories are: [animal,device,food,greeting]
Choose a category:
|: fruits.
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
ENG
12:17 AM
5/10/2022

```
The available categories are: [animal,device,food,greeting]
Choose a category:
|: fruits.
This category does not exist.
Choose a category:
|: food.
Choose a length:
|: 2.
There are no words of this length.
Choose a length:
|: 3.
There are no words of this length.
Choose a length:
|: 4.
Game started. You have 5 guesses:
Enter a word composed of 4 letters:
|: carrot.
Word is not composed of 4 letters. Try again.
Remaining Guesses are 5
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
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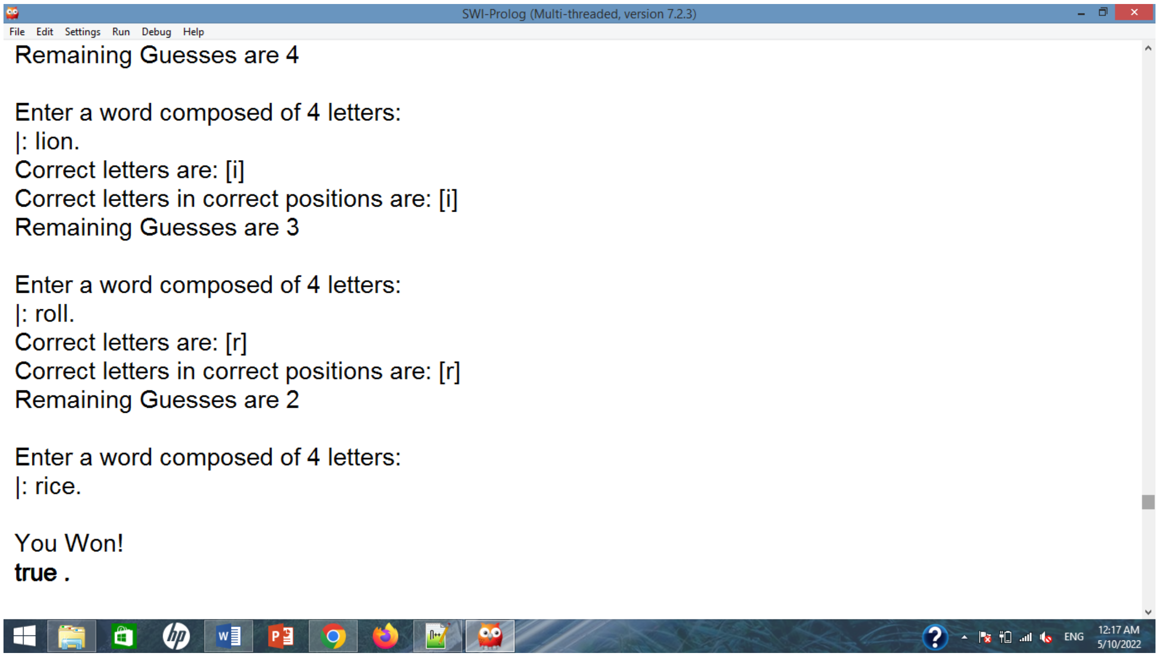
12:17 AM
5/10/2022

```
Enter a word composed of 4 letters:
|: peas.
Correct letters are: [e]
Correct letters in correct positions are: []
Remaining Guesses are 4

Enter a word composed of 4 letters:
|: lion.
Correct letters are: [i]
Correct letters in correct positions are: [i]
Remaining Guesses are 3

Enter a word composed of 4 letters:
|: roll.
Correct letters are: [r]
Correct letters in correct positions are: [r]
Remaining Guesses are 2

Enter a word composed of 4 letters:
|: rice.
```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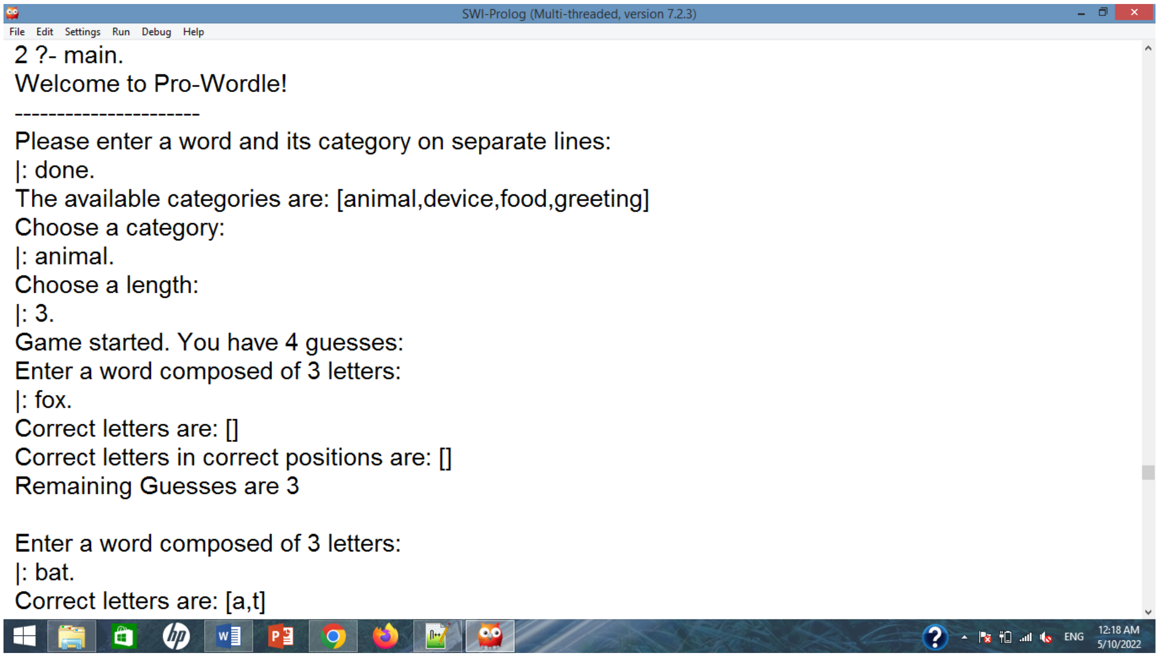
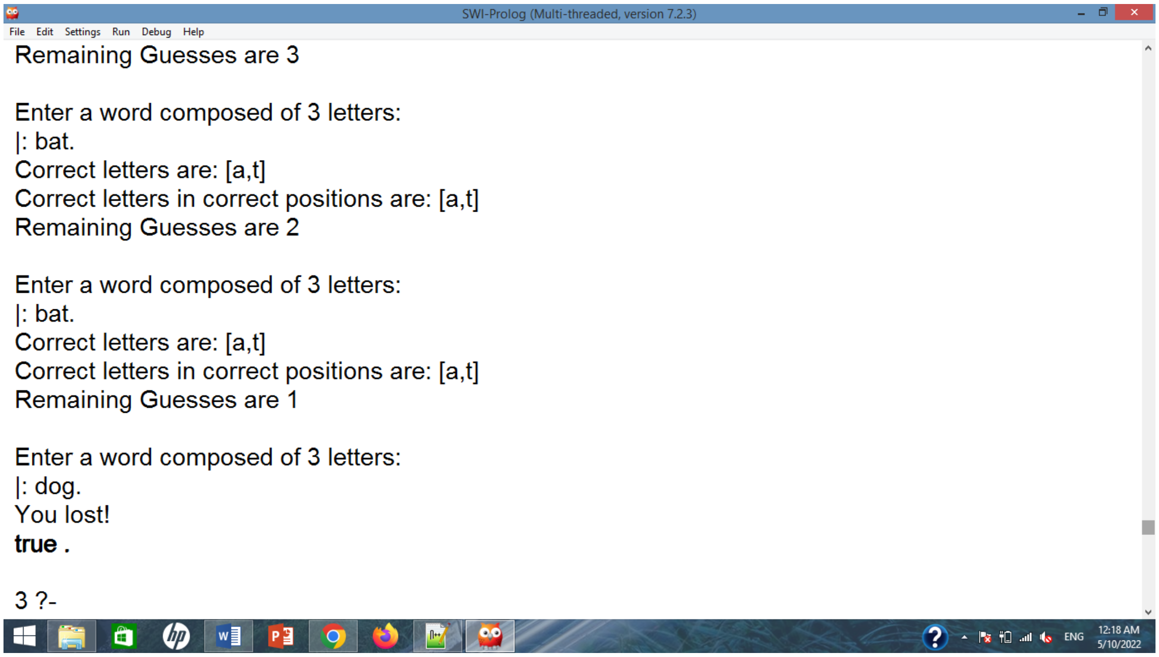
12:17 AM
5/10/2022

```
Remaining Guesses are 4

Enter a word composed of 4 letters:
|: lion.
Correct letters are: [i]
Correct letters in correct positions are: [i]
Remaining Guesses are 3

Enter a word composed of 4 letters:
|: roll.
Correct letters are: [r]
Correct letters in correct positions are: [r]
Remaining Guesses are 2

Enter a word composed of 4 letters:
|: rice.

You Won!
true .
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
ENG
12:18 AM
5/10/2022

```
2 ?- main.
Welcome to Pro-Wordle!
----------------------
Please enter a word and its category on separate lines:
|: done.
The available categories are: [animal,device,food,greeting]
Choose a category:
|: animal.
Choose a length:
|: 3.
Game started. You have 4 guesses:
Enter a word composed of 3 letters:
|: fox.
Correct letters are: []
Correct letters in correct positions are: []
Remaining Guesses are 3

Enter a word composed of 3 letters:
|: bat.
Correct letters are: [a,t]
```


SWI-Prolog (Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help
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12:18 AM
5/10/2022

```
Remaining Guesses are 3

Enter a word composed of 3 letters:
|: bat.
Correct letters are: [a,t]
Correct letters in correct positions are: [a,t]
Remaining Guesses are 2

Enter a word composed of 3 letters:
|: bat.
Correct letters are: [a,t]
Correct letters in correct positions are: [a,t]
Remaining Guesses are 1

Enter a word composed of 3 letters:
|: dog.
You lost!
true .

3 ?-
```