Activity: Word Master

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7 December 2023

Let's try to create Wordle. It's also known as Word Master from Bookworm. It's the one where you have a five-letter word to guess in at most five rounds. Each guess also produces hints.

- You have five chances to guess a word.
- When your entry matches a letter in the word and is also at the correct position, that letter becomes gold/green.
- When your entry matches a letter in the word but is not the letter at that position, that letter becomes silver/yellow.
- When a letter isn't even in the word, it becomes red, or is simply eliminated from the choices.

So, we might need four things.

1. The word to guess. This includes a part where we input this. Later, this can be changed into a word bank.
2. The letter choices. This includes a part where we update the choices after a guess.
3. The submitted answer.
4. The hints after each guess.

We might need the following functions:

- `sample` The `sample` function allows you to have **R** randomly select an element from a vector. In this example, we might be able to set it up as a word bank.

```
PossibleWords <- c("HELLO", "PLANT", "TULIP")
```

- `LETTERS` is a vector of characters from A to Z.

```
LETTERS

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

- `setdiff(vecA,vecB)` removes objects in `vecA` matching objects in `vecB`.

```
setdiff(LETTERS,c("M","A","Z","E","S"))

##  [1] "B" "C" "D" "F" "G" "H" "I" "J" "K" "L" "N" "O" "P" "Q" "R" "T" "U" "V" "W"
## [20] "X" "Y"
```

- `strsplit(x="HELLO",split="")` and `unlist(list)`.

  `strsplit(x="HELLO",split="")` splits up a string `x`, in this case `"HELLO"` into a list of its letters:

```
strsplit(x="HELLO",split="")

## [[1]]
## [1] "H" "E" "L" "L" "O"
```

  While `unlist(list)` changes a list-data structure, `list`, into a vector-data structure:

```
unlist(strsplit(x="HELLO",split=""))

## [1] "H" "E" "L" "L" "O"
```

This helps references to individual letters.

- `paste(...,sep="")` is the reverse of strsplit, where inputs are concatenated into a single string. `sep=""` specifies there should be nothing in between them

```
paste("H","*",sep="")

## [1] "H*"
```

Since formatting can be complicated, we can put an asterisk for misplaced letters and leave unmatched letters blank.

As an example:

```
#The word to be guessed is "FRUIT".
input <- "FRUIT"
#This puts the letters, in sequence, in a vector
secret <- unlist(strsplit(x=input,split=""))
#To check, lets print out secret
secret

## [1] "F" "R" "U" "I" "T"

#The choices at the start is the whole alphabet
choices <- LETTERS
choices

##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"
## [20] "T" "U" "V" "W" "X" "Y" "Z"

#The user guesses "FLINT"
guess <- "FLINT"
#This puts the letters, in sequence, in a vector
guess2 <- unlist(strsplit(x=guess,split=""))
guess2

## [1] "F" "L" "I" "N" "T"

#Now we need to check how the input and guess match up
#We prepare a vector for the response
correct <- character(5)
for(i in 1:5){
    if(secret[i] == guess2[i]){
        correct[i] <- guess2[i]
    } else if(guess2[i] %in% secret){
        correct[i] <- paste(guess2[i],"*",sep="")
    } else {
        choices <- setdiff(choices,guess2[i])
    }
}
choices

##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "M" "O" "P" "Q" "R" "S" "T" "U"
## [20] "V" "W" "X" "Y" "Z"

correct

## [1] "F"  ""   "I*" ""   "T"
```