Program Explanation

The code is well-commented to explain what's happening. The applyRule() and precondition(), don't have comments because they need proper explanation.

The explanation below provides detailed explanation of each condition and loop used in he applyRule() and precondition() function.

Assumptions:

rows: (the value of starting row we get)
cols: (the value of stating column we get)
m: (total no. of rows in the grid)
n: (total no. of columns in the grid)
length: (length of the word to be entered in the grid)

There are 8 directions in which the words can be entered in the grid:

1. 

   dh = 1
   dv = 0

   Condition to be met for entering the word in the manner:
   (cols + length) < = n
   After each letter is entered
   (cols = cols + 1)

2. 

   dh = -1
   dv = 0

   Condition to be met for entering the word in the manner:
   (cols – length + 1) > = 0
   After each letter is entered
   (cols = cols - 1)

3. 

dh = 0
dv = -1

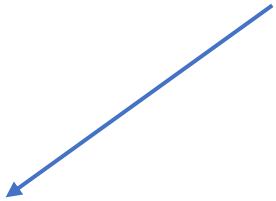
Condition to be met for entering the word in the manner:
(rows – length + 1) > = 0
After each letter is entered
(rows = rows - 1)

4. 

dh = 0
dv = 1

Condition to be met for entering the word in the manner:
(rows + length) < = m
After each letter is entered
(rows = rows + 1)

5.



dh = -1
dv = 1

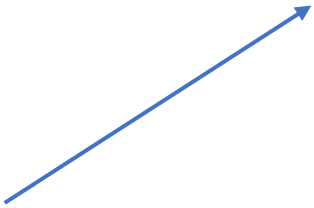
Condition to be met for entering the word in the manner:

(rows + length) < = m
(cols – length + 1) > = 0

After each letter is entered

(cols = cols – 1)
(rows = rows + 1)

6.



dh = + 1
dv = - 1

Condition to be met for entering the word in the manner:

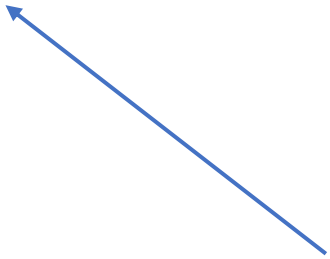
(rows - length +1) > = 0
(cols + length) < = n

After each letter is entered

(cols = cols + 1)

(rows = rows -1)

7.

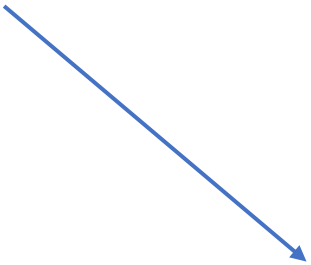


dh = - 1
dv = - 1

Condition to be met for entering the word in the manner:
(cols - length +1) > = 0
(rows – length + 1) > = 0

After each letter is entered
(cols = cols - 1)
(rows = rows - 1)

8.



dh = 1
dv = 1

Condition to be met for entering the word in the manner:
(cols + length) > = n
(rows + length) > = m

After each letter is entered
(cols = cols + 1)
(rows = rows + 1)

The applyRule() checks all these conditions and adds letter at positions in the grid

The precondition() calls applyRule() to check if entering a certain word is valid according to some rule and precondition() also checks whether the letters in the already existing grid matches to the letter at the same position in the grid or not.

Then the generateRules() calls precondition() and generate all the possible rules for a word starting at a particular position in the grid

The flailWildly() calls generateRules() and chooses one random rule and applies the rule using applyRule() function