SE 3XA3: Module Interface Specification Scrabble Project

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March 13, 2020

This document is the Module Interface Specification of the Scrabble Project being done by Team Trifecta.

Table 1: **Revision History**

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

Tile Module

Module

Tile Type

Uses

N/A

Syntax

Exported Constants

N/A

Exported Types

Tile = tuple of (letter: str, score: $\mathbb{N}$)

Exported Access Programs

Routine name	In	Out	Exceptions
init	str	Tile	invalid_size
getLetter		str	
getScore		$\mathbb{N}$	

Semantics

State Variables

letter
score

Environment Variables

None

State Invariant

$0 < score \leq 10$

Assumptions

N/A

Access Routine Semantics

init(*letter*):

- transition: $score := LETTER\_VALUES[letter]$

- output: None

- exception: None

getLetter():

- transition: None

- output: letter

- exception: None

getScore():

- transition: None

- output: score

- exception: None

Local Constants

$LETTER\_VALUES$ = tuple of ($"A" : \mathbb{N}, "B" : \mathbb{N}, "C" : \mathbb{N}, "D" : \mathbb{N}, "E" : \mathbb{N}, "F" : \mathbb{N}, "G" : \mathbb{N}, "H" : \mathbb{N}, "I" : \mathbb{N}, "J" : \mathbb{N}, "K" : \mathbb{N}, "L" : \mathbb{N}, "M" : \mathbb{N}, "N" : \mathbb{N}, "O" : \mathbb{N}, "P" : \mathbb{N}, "Q" : \mathbb{N}, "R" : \mathbb{N}, "S" : \mathbb{N}, "T" : \mathbb{N}, "U" : \mathbb{N}, "V" : \mathbb{N}, "W" : \mathbb{N}, "X" : \mathbb{N}, "Y" : \mathbb{N}, "Z" : \mathbb{N}$)

Bag Module

Module

Bag Type

Uses

Tile

Syntax

Exported Constants

N/A

Exported Types

Bag = list of Tiles

Exported Access Programs

Routine name	In	Out	Exceptions
init		Bag	
addToBag	Tile, N	Bag	
initBag			
takeFromBag		Tile	
getRemainingTiles		N	

Semantics

State Variables

Bag

Environment Variables

None

State Invariant

$0 \leq |Bag| \leq 100$

Assumptions

N/A

Access Routine Semantics

init():

- transition: ?

- output: ?

- exception: None

addToBag(Tile, n):

- transition: $Bag \rightarrow Bag + n * Tiles$

- output: None

- exception: None

initBag():

- transition: $Bag \rightarrow Bag + a * Tiles(A) + b * Tiles(B) + ... + z * Tiles(Z)$
  where a, b,..., z are the number of that lettered tile to be in the bag.
  Additionally shuffles the order of the letters.

- output: None

- exception: None

takeFromBag():

- transition: $|Bag| \rightarrow |Bag| - 1$

- output: $Bag(|Bag| - 1)$

- exception: None

getRemainingTiles():

- transition: None

- output: $|Bag|$

- exception: None

Rack Module

Module

Rack Type

Uses

Bag

Syntax

Exported Constants

N/A

Exported Types

Rack = set of Tiles where $t : Tile \in Bag$

Exported Access Programs

Routine name	In	Out	Exceptions
init	str	Bag	invalid_size
getLetter		str	
getScore		$\mathbb{N}$	

Semantics

State Variables

rack
bag

Environment Variables

None

State Invariant

$0 < score \leq 10$

Assumptions

N/A

Access Routine Semantics

init(*letter*):

- transition: $score := LETTER\_VALUES[letter]$

- output: None

- exception: None

getLetter():

- transition: None

- output: letter

- exception: None

getScore():

- transition: None

- output: score

- exception: None

Local Constants