

Requirements Specification Document

Group number: 02

Lab Section: L01

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Search Module

Template Module

Search(String)

Uses

YouTuber, Read

Syntax

Exported Constants

None

Exported Types

Search = ?

Exported Access Programs

Routine name	In	Out	Exceptions
new Search	String Title		
displayStats	String Title, a sequence of YouTuber	String Country, String Category_name, String JoinDate, ℕ Followers ℕ Videos	NotFoundException

Semantics

State Variables

name: String

youtuberList: a sequence of YouTuber

State Invariant

None

Access Routine Semantics

new Search($n : \text{String}$)

- transition: $\text{name} := n$
- output: $\text{out} := \text{self}$
- exception: none

displayStats($s : \text{String}, l : \text{sequence}$)

- output: $\text{out} := \langle \text{Country}, \text{Category_name}, \text{JoinDate}, \text{Followers}, \text{Videos} \rangle$
- exception: $(s \notin l \Rightarrow \text{NotFoundException})$

Graph Module

Template Module

Graph(\mathbb{N})

Uses

YouTuber, Read

Syntax

Exported Constants

None

Exported Types

Graph = ?

Exported Access Programs

Routine name	In	Out	Exceptions
new Graph	\mathbb{N} , a sequence of YouTuber	Graph	
Vertices		\mathbb{N}	
Edges		\mathbb{N}	
addEdge	YouTuber, YouTuber		
adj	YouTuber	YouTuber	

Semantics

State Variables

vertices: \mathbb{N}

edges: \mathbb{N}

AdjList: a sequence of a sequence of YouTuber

State Invariant

None

Assumptions

The constructor Graph should be called before calling any other methods.

Access Routine Semantics

new Graph(V, L)

- transition: vertices, edges, AdjList := V, 0, L
- output: out := self
- exception: none

Vertices()

- output: out := vertices
- exception: none

Edges()

- output: out := edges
- exception: none

addEdge(v, w)

- transition: $(v, w : \text{YouTuber} \mid L : \text{a sequence of YouTuber} : (v \in L[0] \wedge L \in \text{AdjList} \Rightarrow L.\text{add}(w)) \vee (w \in L[0] \wedge L \in \text{AdjList} \Rightarrow L.\text{add}(v)))$
- exception: none

adj(Y)

- output: out := $(\text{adjacency} : \text{YouTuber} \mid Y : \text{YouTuber}, L : \text{a sequence of YouTuber} : (Y = L[0] \wedge L \in \text{AdjList} \Rightarrow \text{adjacency} = L[1..|L| - 1]))$
- exception: none

YouTuber Module

Template Module

YouTuber

Uses

None

Syntax

Exported Constants

None

Exported Types

YouTuber = ?

Exported Access Programs

Routine name	In	Out	Exceptions
new YouTuber	N, String, N, String, String, String, N	YouTuber	
getCategory_id		N	
getCategory_name		String	
getCountry		String	
getFollowers		N	
getJoinDate		String	
getTitle		String	
getVideos		N	

Semantics

State Variables

cat_id: N

cat_name: String

country: String
followers: N
join_date: String
title: String
videos: String

State Invariant

None

Assumptions

The constructor “YouTuber” should be called before calling any other methods.

Access Routine Semantics

new YouTuber(id, n, c, f, j, t, v)

- transition: cat_id, cat_name, country, followers, join_date, title, videos := id, n, c, f, j, t, v
- output: out := self
- exception: none

getCategory_id()

- output: out := cat_id
- exception: none

getCategory_name()

- output: out := cat_name
- exception: none

getCountry()

- output: out := country
- exception: none

getFollowers()

- output: out := followers
- exception: none

getJoinDate()

- output: out := join_date
- exception: none

getTitle()

- output: out := title
- exception: none

getVideos()

- output: out := videos
- exception: none

Read File Module

Module

Read

Uses

YouTuber

Syntax

Exported Constants

None

Exported Types

Read = ?

Exported Access Programs

Routine name	In	Out	Exceptions
read	String	Read	FileNotFoundException
generateYouTuberList	String	Sequence of YouTuber	

Semantics

State Variables

filename: String

list: a sequence of YouTuber

State Invariant

None

Assumptions

The method “read” should be called before any other methods.

Access Routine Semantics

read(f)

- transition: filename := f
- output: out := self
- exception: File does not exist

generateYouTuberList()

- output: out := a sequence of YouTuber
- exception: none

Sort Module

Template Module

Sort(a sequence of YouTuber)

Uses

YouTuber, Search

Syntax

Exported Constants

None

Exported Types

Sort = ?

Exported Access Programs

Routine name	In	Out	Exceptions
new Sort	a sequence of YouTuber	Sort	
MergeSort_Followers		Sort	
MergeSort_Videos		Sort	
QuickSort_Followers		Sort	
QuickSort_Videos		Sort	

Semantics

State Variables

s: a sequence of YouTuber

State Invariant

None

Assumptions

The method “new Sort” should be called before any other methods.

Access Routine Semantics

MergeSort_Followers()

- output: $\text{out} := x : \text{Sort} \mid \forall i : \mathbb{N} \mid i \in [0..|s| - 2] : s[i].\text{getFollowers}() \geq s[i + 1].\text{getFollowers}()$
- exception: none

MergeSort_Videos()

- output: $\text{out} := x : \text{Sort} \mid \forall i : \mathbb{N} \mid i \in [0..|s| - 2] : s[i].\text{getVideos}() \geq s[i + 1].\text{getVideos}()$
- exception: none

QuickSort_Followers()

- output: $\text{out} := x : \text{Sort} \mid \forall i : \mathbb{N} \mid i \in [0..|s| - 2] : s[i].\text{getFollowers}() \geq s[i + 1].\text{getFollowers}()$
- exception: none

QuickSort_Videos()

- output: $\text{out} := x : \text{Sort} \mid \forall i : \mathbb{N} \mid i \in [0..|s| - 2] : s[i].\text{getVideos}() \geq s[i + 1].\text{getVideos}()$
- exception: none