Requirements Specification Document

Group number: 02

Lab Section: L01

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Search Module

Module

Search

Uses

YouTuber, Graph

Syntax

Exported Constants

None

Exported Access Programs

Routine name	In	Out	Exceptions
Search	String, a sequence of a sequence of YouTuber	a sequence of YouTuber	
displayStats	String, 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

Search_id(n, s)

- transition: name, youtuberList ≔ n, s
- output: out ≔ L : a sequence of YouTuber where (x : YouTuber | x.getCategory_name() = s ⇒ L.add(x))
- exception: none

displayStats(s : String, l : sequence)

- output: out ≔ <Country, Category_name, JoinDate, Followers, Videos>
- exception: (s ∉ l ⇒ NotFoundException)

Graph Module

Template Module

Graph(ℕ)

Uses

YouTuber, Read

Syntax

Exported Constants

None

Exported Types

Graph = ?

Exported Access Programs

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

Semantics

State Variables

vertices: ℕ

edges: 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 $\coloneqq$ V, 0, L
- output: out $\coloneqq$ self
- exception: none

Vertices()

- output: out $\coloneqq$ vertices
- exception: none

Edges()

- output: out $\coloneqq$ edges
- exception: none

addEdge(v, w)

- transition: (v, w : YouTuber | L : 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 $\coloneqq$ (adjacency : YouTuber | Y: YouTuber, L : 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

Module

Sort

Uses

YouTuber, Search

Syntax

Exported Constants

None

Exported Access Programs

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

Semantics

State Variables

s: sequence of YouTuber

State Invariant

None

Access Routine Semantics

MergeSort_Followers()

- output: out ≔ sequence of YouTuber where ∀ i : N|i ∈ [0..|s| - 2] : s[i].getFollowers() ⩾ s[i + 1].getFollowers()
- exception: none

MergeSort_Videos()

- output: out ≔ sequence of YouTuber where $\forall$ i : N|i $\in$ [0..|s| - 2] : s[i].getVideos()$\geqslant$ s[i + 1].get Videos()
- exception: none

QuickSort_Followers()

- output: out ≔ sequence of YouTuber where $\forall$ i : N|i $\in$ [0..|s| - 2] : s[i].getFollowers() $\geqslant$ s[i + 1].getFollowers()
- exception: none

QuickSort_Videos()

- output: out ≔ sequence of YouTuber where $\forall$ i : N|i $\in$ [0..|s| - 2] : s[i].getVideos() $\geqslant$ s[i + 1].get Videos()
- exception: none