Requirements Specification Document

Group number: 02

Lab Section: L01

Team members: Kabishan Suvendran, Franklin Tian, Jiawei Yu, Bowen Zhang

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 ≔ 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 : YouTuber | L : a sequence of YouTuber : (v =∈ L[0] ∧ L ∈ AdjList ⇒ L.add(w)) ∨ (w ∈ L[0] ∧ L ∈ AdjList ⇒ L.add(v)))
* exception: none

adj(Y)

* output: out ≔ (adjacency : YouTuber | Y: YouTuber, L : a sequence of YouTuber : (Y = L[0] ∧ L ∈ AdjList ⇒ 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 ∀ i : N|i ∈ [0..|s| - 2] : s[i].getVideos()≥ s[i + 1].get Videos()
* exception: none

QuickSort\_Followers()

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

QuickSort\_Videos()

* output: out ≔ sequence of YouTuber where ∀ i : N|i ∈ [0..|s| - 2] : s[i].getVideos() ≥ s[i + 1].get Videos()
* exception: none