

Practical 9

Student Helper Portal

18 November 2021

Z notation

Formal specification using Z notation

• Login :

Login

 $\exists \text{ Github Database}, \exists \text{ Google Database}$

login_id? : email

password? : password

auth! : false

 $(\text{login_id?} \in \text{Github Database} \wedge \text{password?} \in \text{Github Database}) \vee (\text{email_id?} \in \text{Google Database} \wedge \text{password?} \in \text{Google Database})$
 $\Rightarrow \text{auth!} = \text{true}$
 $(\text{login_id?} \notin \text{Github Database} \vee \text{password?} \notin \text{Github Database}) \wedge (\text{email_id?} \notin \text{Google Database} \vee \text{password?} \notin \text{Google Database})$
 $\Rightarrow \text{auth!} = \text{false}$

• Register :

Register

 $\exists \text{ Github Database}, \exists \text{ Google Database}$

login_id? : email

password? : password

option? : \mathbb{N}_1

isRegistered! : false

 $\text{option?} == 1 \wedge \text{login_id?} \notin \text{Github Database}$
 $\Rightarrow \text{password!} = \text{password?}, \text{isRegistered!} : \text{true}$
 $\text{option?} == 2 \wedge \text{login_id?} \notin \text{Google Database}$
 $\Rightarrow \text{password!} = \text{password?}, \text{isRegistered!} : \text{true}$

• Manage blogs :

Manage blogs

Δ Github Database, Δ Google Database, Ξ Database

login_id? : email

password? : password

option? : $\mathbb{N}1$

blog_user_id? : string

blog_title? : string

blog_type? : string

blog_content? : string

blog_description? : string

isSuccess! : false

$(\text{option?} == 1 \wedge \text{login_id?} \in \text{Github Database} \wedge \text{password?} \in \text{Github Database}) \vee (\text{option?} == 2 \wedge \text{login_id?} \in \text{Google Database} \wedge \text{password?} \in \text{Google Database})$

$\Rightarrow \text{isSuccess!} = \text{add_blog}(\text{blog_user_id?}, \text{blog_title?}, \text{blog_type?}, \text{blog_content?}, \text{blog_description?})$

$\Rightarrow \text{isSuccess!} = \text{edit_blog}(\text{blog_id?})$

$\Rightarrow \text{isSuccess!} = \text{remove_blog}(\text{blog_id?})$

• Manage Events :

Manage Events

Δ Github Database, Δ Google Database, Ξ Database

login_id? : email

password? : password

option? : $\mathbb{N}1$

event_id? : $\mathbb{N}1$

event_name? : string

event_date? : date

event_venue? : string

event_type? : string

organiser? : string

isSuccess! : false

$(\text{option?} == 1 \wedge \text{login_id?} \in \text{Github Database} \wedge \text{password?} \in \text{Github Database}) \vee (\text{option?} == 2 \wedge \text{login_id?} \in \text{Google Database} \wedge \text{password?} \in \text{Google Database})$

$\Rightarrow \text{isSuccess!} = \text{add_event}(\text{event_name?}, \text{event_date?}, \text{event_venue?}, \text{event_type?}, \text{organiser?})$

$\Rightarrow \text{isSuccess!} = \text{edit_event}(\text{event_id?})$

$\Rightarrow \text{isSuccess!} = \text{delete_event}(\text{event_id?})$

• Manage Projects :

Manage Projects

Δ Github Database, Δ Google Database, Ξ Database

login_id? : email

password? : password

option? : \mathbb{N}_1

project_name? : string

creation_date? : date

contributors? : string

author? : string

project_status? : string

project_link? : string

project_id? : \mathbb{N}_1

comments? : string

isSuccess! : false

$(\text{option?} == 1 \wedge \text{login_id?} \in \text{Github Database} \wedge \text{password?} \in \text{Github Database}) \vee (\text{option?} == 2 \wedge \text{login_id?} \in \text{Google Database} \wedge \text{password?} \in \text{Google Database})$

$\Rightarrow \text{isSuccess!} = \text{add_project}(\text{project_name?}, \text{creation_date?}, \text{contributors?}, \text{author?}, \text{project_status?}, \text{project_link?}, \text{project_id?}, \text{comments?})$

$\Rightarrow \text{isSuccess!} = \text{edit_projecy}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{delete_event}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{add_collaboration}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{remove_collaboration}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{add_contributors}(\text{project_id?}, \text{contributors?})$

$\Rightarrow \text{isSuccess!} = \text{remove_contributors}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{update_status}(\text{project_id?}, \text{project_status?})$

$\Rightarrow \text{isSuccess!} = \text{like_project}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{dislike_project}(\text{project_id?})$

$\Rightarrow \text{isSuccess!} = \text{add_comment}(\text{project_id?}, \text{comments?})$