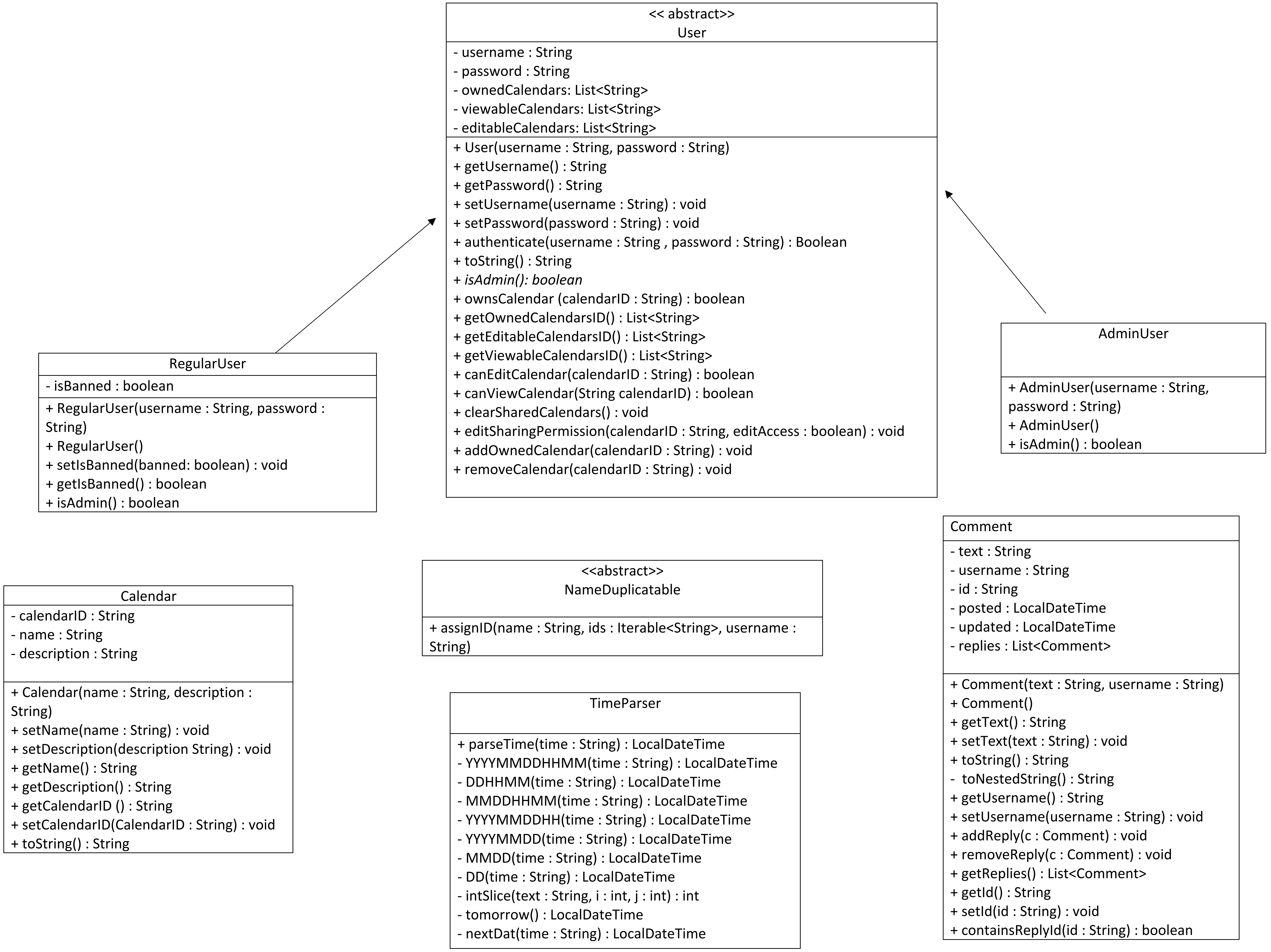
UML Model
Entities:



<< abstract>>
User

- username : String
- password : String
- ownedCalendars: List<String>
- viewableCalendars: List<String>
- editableCalendars: List<String>

+ User(username : String, password : String)
+ getUsername() : String
+ getPassword() : String
+ setUsername(username : String) : void
+ setPassword(password : String) : void
+ authenticate(username : String , password : String) : Boolean
+ toString() : String
+ *isAdmin(): boolean*
+ ownsCalendar (calendarID : String) : boolean
+ getOwnedCalendarsID() : List<String>
+ getEditableCalendarsID() : List<String>
+ getViewableCalendarsID() : List<String>
+ canEditCalendar(calendarID : String) : boolean
+ canViewCalendar(String calendarID) : boolean
+ clearSharedCalendars() : void
+ editSharingPermission(calendarID : String, editAccess : boolean) : void
+ addOwnedCalendar(calendarID : String) : void
+ removeCalendar(calendarID : String) : void

RegularUser

- isBanned : boolean

+ RegularUser(username : String, password : String)
+ RegularUser()
+ setIsBanned(banned: boolean) : void
+ getIsBanned() : boolean
+ isAdmin() : boolean

AdminUser

+ AdminUser(username : String, password : String)
+ AdminUser()
+ isAdmin() : boolean

Calendar

- calendarID : String
- name : String
- description : String

+ Calendar(name : String, description : String)
+ setName(name : String) : void
+ setDescription(description String) : void
+ getName() : String
+ getDescription() : String
+ getCalendarID () : String
+ setCalendarID(CalendarID : String) : void
+ toString() : String

<<abstract>>
NameDuplicatable

+ assignID(name : String, ids : Iterable<String>, username : String)

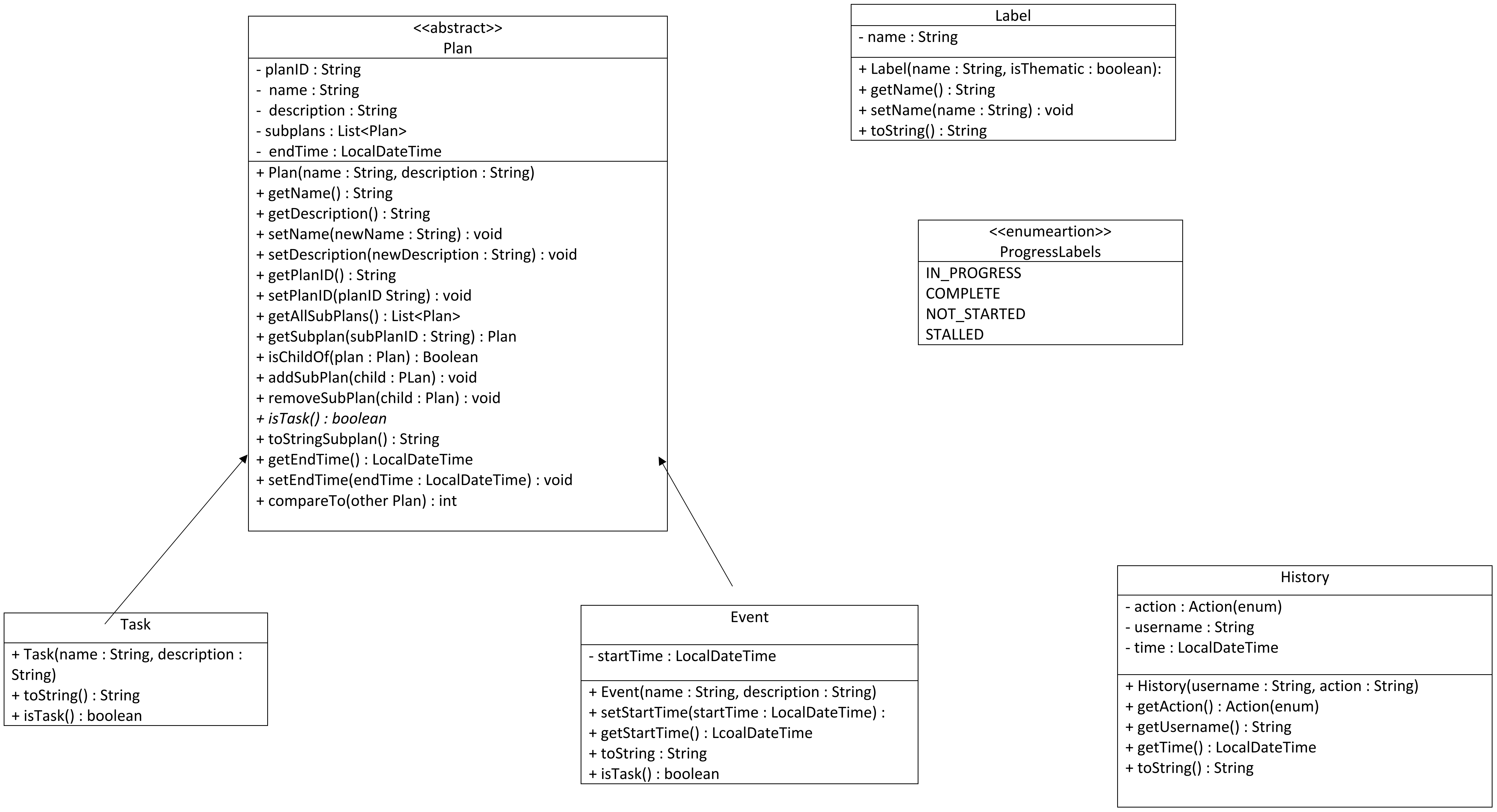
TimeParser

+ parseTime(time : String) : LocalDateTime
- YYYYMMDDHHMM(time : String) : LocalDateTime
- DDHHMM(time : String) : LocalDateTime
- MMDDHHMM(time : String) : LocalDateTime
- YYYYMMDDHH(time : String) : LocalDateTime
- YYYYMMDD(time : String) : LocalDateTime
- MMDD(time : String) : LocalDateTime
- DD(time : String) : LocalDateTime
- intSlice(text : String, i : int, j : int) : int
- tomorrow() : LocalDateTime
- nextDat(time : String) : LocalDateTime

Comment

- text : String
- username : String
- id : String
- posted : LocalDateTime
- updated : LocalDateTime
- replies : List<Comment>

+ Comment(text : String, username : String)
+ Comment()
+ getText() : String
+ setText(text : String) : void
+ toString() : String
- toNestedString() : String
+ getUsername() : String
+ setUsername(username : String) : void
+ addReply(c : Comment) : void
+ removeReply(c : Comment) : void
+ getReplies() : List<Comment>
+ getId() : String
+ setId(id : String) : void
+ containsReplyId(id : String) : boolean



<<abstract>>
Plan

- planID : String
- name : String
- description : String
- subplans : List<Plan>
- endTime : LocalDateTime

+ Plan(name : String, description : String)
+ getName() : String
+ getDescription() : String
+ setName(newName : String) : void
+ setDescription(newDescription : String) : void
+ getPlanID() : String
+ setPlanID(planID String) : void
+ getAllSubPlans() : List<Plan>
+ getSubplan(subPlanID : String) : Plan
+ isChildOf(plan : Plan) : Boolean
+ addSubPlan(child : PLan) : void
+ removeSubPlan(child : Plan) : void
+ isTask() : boolean
+ toStringSubplan() : String
+ getEndTime() : LocalDateTime
+ setEndTime(endTime : LocalDateTime) : void
+ compareTo(other Plan) : int

Label

- name : String

+ Label(name : String, isThematic : boolean):
+ getName() : String
+ setName(name : String) : void
+ toString() : String

<<enumeartion>>
ProgressLabels

IN_PROGRESS
COMPLETE
NOT_STARTED
STALLED

Task

+ Task(name : String, description : String)
+ toString() : String
+ isTask() : boolean

Event

- startTime : LocalDateTime

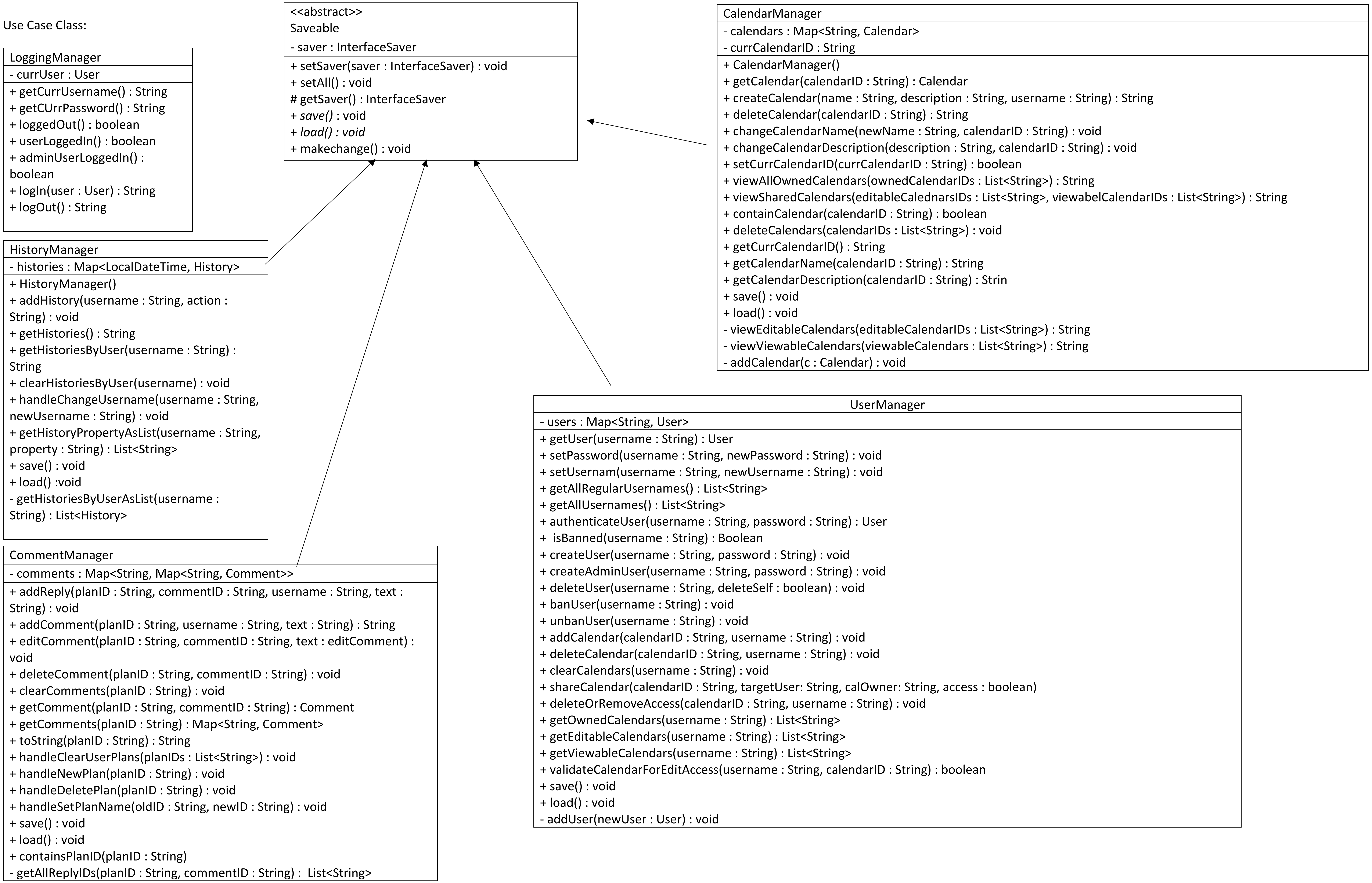
+ Event(name : String, description : String)
+ setStartTime(startTime : LocalDateTime) :
+ getStartTime() : LcoalDateTime
+ toString : String
+ isTask() : boolean

History

- action : Action(enum)
- username : String
- time : LocalDateTime

+ History(username : String, action : String)
+ getAction() : Action(enum)
+ getUsername() : String
+ getTime() : LocalDateTime
+ toString() : String

Use Case Class:



```
<<abstract>>
Saveable
- saver : InterfaceSaver
+ setSaver(saver : InterfaceSaver) : void
+ setAll() : void
# getSaver() : InterfaceSaver
+ save() : void
+ load() : void
+ makechange() : void
```

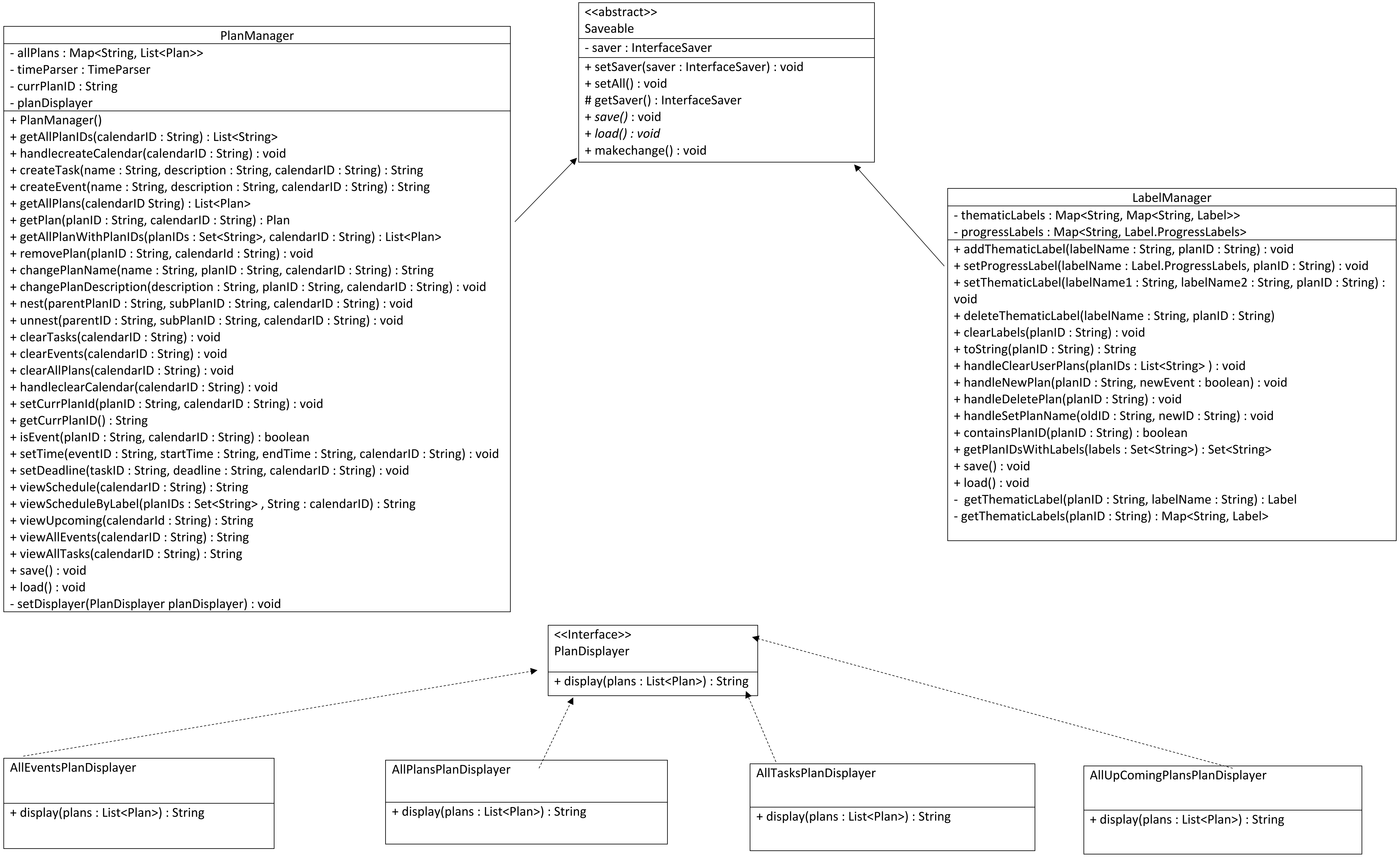
```
LoggingManager
- currUser : User
+ getCurrUsername() : String
+ getCUrrPassword() : String
+ loggedOut() : boolean
+ userLoggedIn() : boolean
+ adminUserLoggedIn() :
boolean
+ logIn(user : User) : String
+ logOut() : String
```

```
HistoryManager
- histories : Map<LocalDateTime, History>
+ HistoryManager()
+ addHistory(username : String, action :
String) : void
+ getHistories() : String
+ getHistoriesByUser(username : String) :
String
+ clearHistoriesByUser(username) : void
+ handleChangeUsername(username : String,
newUsername : String) : void
+ getHistoryPropertyAsList(username : String,
property : String) : List<String>
+ save() : void
+ load() :void
- getHistoriesByUserAsList(username :
String) : List<History>
```

```
CommentManager
- comments : Map<String, Map<String, Comment>>
+ addReply(planID : String, commentID : String, username : String, text :
String) : void
+ addComment(planID : String, username : String, text : String) : String
+ editComment(planID : String, commentID : String, text : editComment) :
void
+ deleteComment(planID : String, commentID : String) : void
+ clearComments(planID : String) : void
+ getComment(planID : String, commentID : String) : Comment
+ getComments(planID : String) : Map<String, Comment>
+ toString(planID : String) : String
+ handleClearUserPlans(planIDs : List<String>) : void
+ handleNewPlan(planID : String) : void
+ handleDeletePlan(planID : String) : void
+ handleSetPlanName(oldID : String, newID : String) : void
+ save() : void
+ load() : void
+ containsPlanID(planID : String)
- getAllReplyIDs(planID : String, commentID : String) :  List<String>
```

```
CalendarManager
- calendars : Map<String, Calendar>
- currCalendarID : String
+ CalendarManager()
+ getCalendar(calendarID : String) : Calendar
+ createCalendar(name : String, description : String, username : String) : String
+ deleteCalendar(calendarID : String) : String
+ changeCalendarName(newName : String, calendarID : String) : void
+ changeCalendarDescription(description : String, calendarID : String) : void
+ setCurrCalendarID(currCalendarID : String) : boolean
+ viewAllOwnedCalendars(ownedCalendarIDs : List<String>) : String
+ viewSharedCalendars(editableCalednarsIDs : List<String>, viewabelCalendarIDs : List<String>) : String
+ containCalendar(calendarID : String) : boolean
+ deleteCalendars(calendarIDs : List<String>) : void
+ getCurrCalendarID() : String
+ getCalendarName(calendarID : String) : String
+ getCalendarDescription(calendarID : String) : Strin
+ save() : void
+ load() : void
- viewEditableCalendars(editableCalendarIDs : List<String>) : String
- viewViewableCalendars(viewableCalendars : List<String>) : String
- addCalendar(c : Calendar) : void
```

```
UserManager
- users : Map<String, User>
+ getUser(username : String) : User
+ setPassword(username : String, newPassword : String) : void
+ setUsernam(username : String, newUsername : String) : void
+ getAllRegularUsernames() : List<String>
+ getAllUsernames() : List<String>
+ authenticateUser(username : String, password : String) : User
+  isBanned(username : String) : Boolean
+ createUser(username : String, password : String) : void
+ createAdminUser(username : String, password : String) : void
+ deleteUser(username : String, deleteSelf : boolean) : void
+ banUser(username : String) : void
+ unbanUser(username : String) : void
+ addCalendar(calendarID : String, username : String) : void
+ deleteCalendar(calendarID : String, username : String) : void
+ clearCalendars(username : String) : void
+ shareCalendar(calendarID : String, targetUser: String, calOwner: String, access : boolean)
+ deleteOrRemoveAccess(calendarID : String, username : String) : void
+ getOwnedCalendars(username : String) : List<String>
+ getEditableCalendars(username : String) : List<String>
+ getViewableCalendars(username : String) : List<String>
+ validateCalendarForEditAccess(username : String, calendarID : String) : boolean
+ save() : void
+ load() : void
- addUser(newUser : User) : void
```



PlanManager

- allPlans : Map<String, List<Plan>>
- timeParser : TimeParser
- currPlanID : String
- planDisplayer

+ PlanManager()
+ getAllPlanIDs(calendarID : String) : List<String>
+ handlecreateCalendar(calendarID : String) : void
+ createTask(name : String, description : String, calendarID : String) : String
+ createEvent(name : String, description : String, calendarID : String) : String
+ getAllPlans(calendarID String) : List<Plan>
+ getPlan(planID : String, calendarID : String) : Plan
+ getAllPlanWithPlanIDs(planIDs : Set<String>, calendarID : String) : List<Plan>
+ removePlan(planID : String, calendarId : String) : void
+ changePlanName(name : String, planID : String, calendarID : String) : String
+ changePlanDescription(description : String, planID : String, calendarID : String) : void
+ nest(parentPlanID : String, subPlanID : String, calendarID : String) : void
+ unnest(parentID : String, subPlanID : String, calendarID : String) : void
+ clearTasks(calendarID : String) : void
+ clearEvents(calendarID : String) : void
+ clearAllPlans(calendarID : String) : void
+ handleclearCalendar(calendarID : String) : void
+ setCurrPlanId(planID : String, calendarID : String) : void
+ getCurrPlanID() : String
+ isEvent(planID : String, calendarID : String) : boolean
+ setTime(eventID : String, startTime : String, endTime : String, calendarID : String) : void
+ setDeadline(taskID : String, deadline : String, calendarID : String) : void
+ viewSchedule(calendarID : String) : String
+ viewScheduleByLabel(planIDs : Set<String> , String : calendarID) : String
+ viewUpcoming(calendarId : String) : String
+ viewAllEvents(calendarID : String) : String
+ viewAllTasks(calendarID : String) : String
+ save() : void
+ load() : void
- setDisplayer(PlanDisplayer planDisplayer) : void

<<abstract>>
Saveable

- saver : InterfaceSaver

+ setSaver(saver : InterfaceSaver) : void
+ setAll() : void
# getSaver() : InterfaceSaver
+ *save()* : void
+ *load() : void*
+ makechange() : void

LabelManager

- thematicLabels : Map<String, Map<String, Label>>
- progressLabels : Map<String, Label.ProgressLabels>

+ addThematicLabel(labelName : String, planID : String) : void
+ setProgressLabel(labelName : Label.ProgressLabels, planID : String) : void
+ setThematicLabel(labelName1 : String, labelName2 : String, planID : String) : void
+ deleteThematicLabel(labelName : String, planID : String)
+ clearLabels(planID : String) : void
+ toString(planID : String) : String
+ handleClearUserPlans(planIDs : List<String>) : void
+ handleNewPlan(planID : String, newEvent : boolean) : void
+ handleDeletePlan(planID : String) : void
+ handleSetPlanName(oldID : String, newID : String) : void
+ containsPlanID(planID : String) : boolean
+ getPlanIDsWithLabels(labels : Set<String>) : Set<String>
+ save() : void
+ load() : void
- getThematicLabel(planID : String, labelName : String) : Label
- getThematicLabels(planID : String) : Map<String, Label>

<<Interface>>
PlanDisplayer

+ display(plans : List<Plan>) : String

AllEventsPlanDisplayer

+ display(plans : List<Plan>) : String

AllPlansPlanDisplayer

+ display(plans : List<Plan>) : String

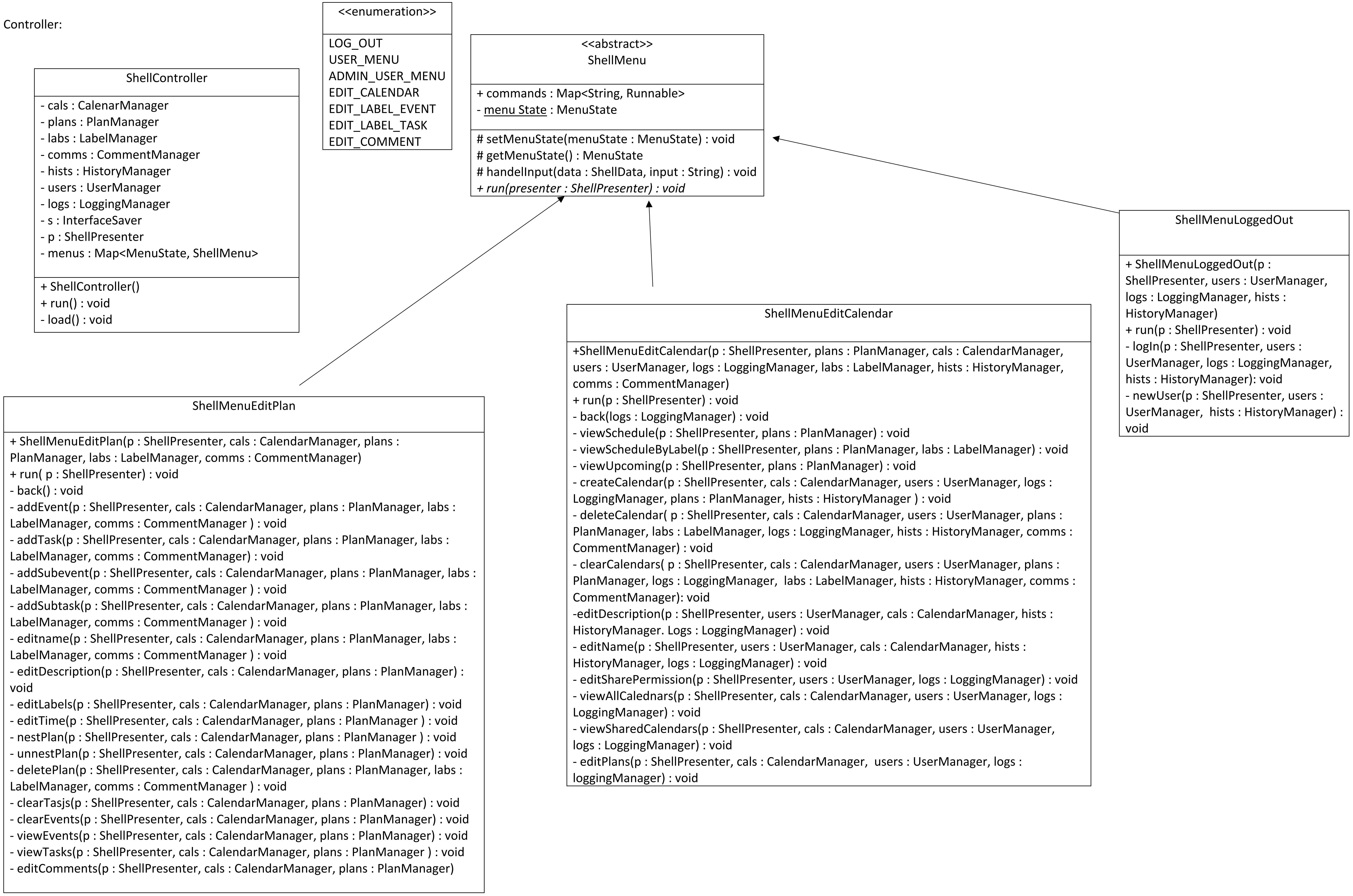
AllTasksPlanDisplayer

+ display(plans : List<Plan>) : String

AllUpComingPlansPlanDisplayer

+ display(plans : List<Plan>) : String

Controller:



<<enumeration>>

LOG_OUT
USER_MENU
ADMIN_USER_MENU
EDIT_CALENDAR
EDIT_LABEL_EVENT
EDIT_LABEL_TASK
EDIT_COMMENT

ShellController

- cals : CalenarManager
- plans : PlanManager
- labs : LabelManager
- comms : CommentManager
- hists : HistoryManager
- users : UserManager
- logs : LoggingManager
- s : InterfaceSaver
- p : ShellPresenter
- menus : Map<MenuState, ShellMenu>

+ ShellController()
+ run() : void
- load() : void

<<abstract>>
ShellMenu

+ commands : Map<String, Runnable>
- menu State : MenuState

# setMenuState(menuState : MenuState) : void
# getMenuState() : MenuState
# handelInput(data : ShellData, input : String) : void
+ run(presenter : ShellPresenter) : void

ShellMenuLoggedOut

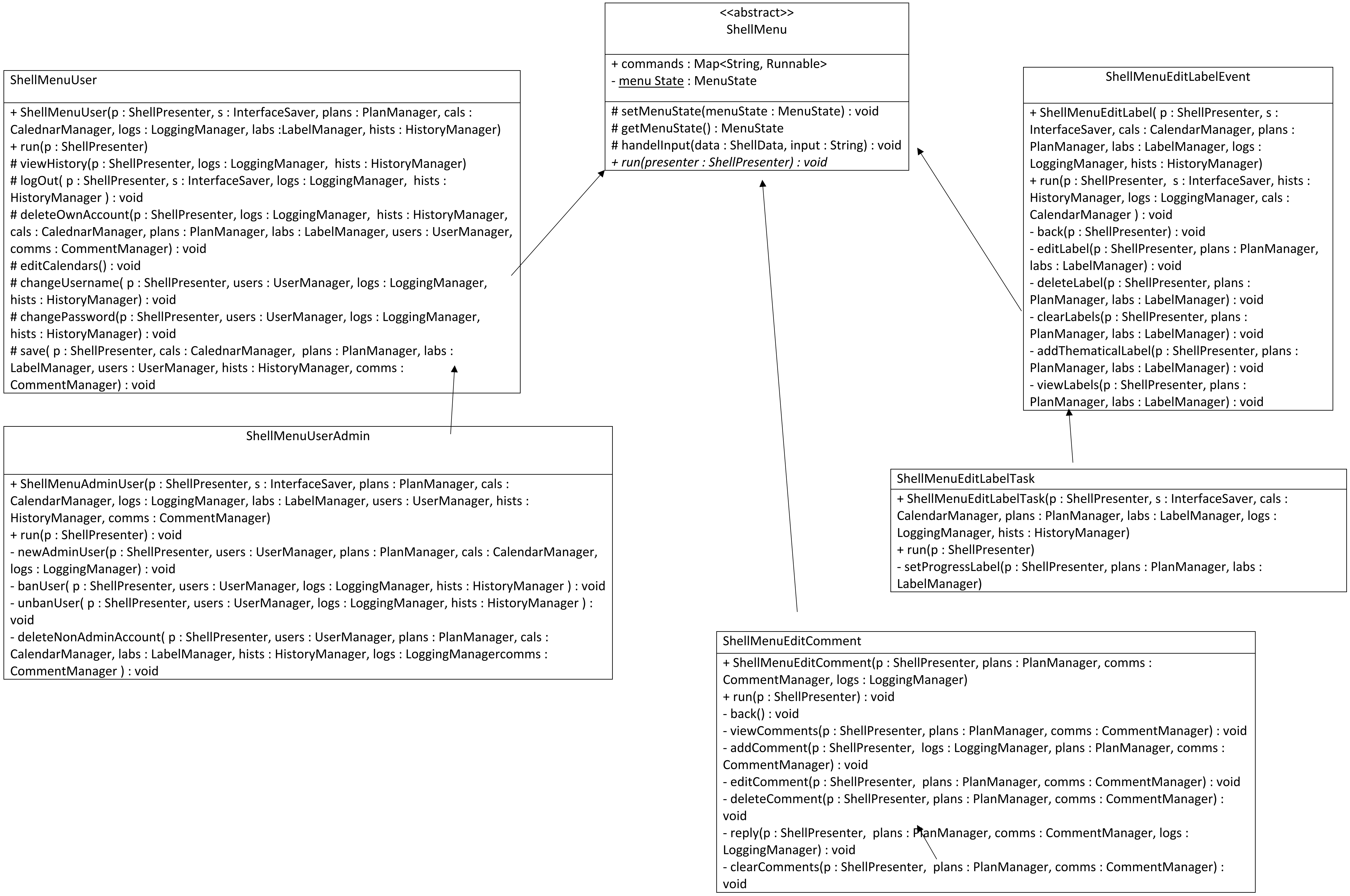
+ ShellMenuLoggedOut(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager)
+ run(p : ShellPresenter) : void
- logIn(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager): void
- newUser(p : ShellPresenter, users : UserManager, hists : HistoryManager) : void

ShellMenuEditCalendar

+ShellMenuEditCalendar(p : ShellPresenter, plans : PlanManager, cals : CalendarManager, users : UserManager, logs : LoggingManager, labs : LabelManager, hists : HistoryManager, comms : CommentManager)
+ run(p : ShellPresenter) : void
- back(logs : LoggingManager) : void
- viewSchedule(p : ShellPresenter, plans : PlanManager) : void
- viewScheduleByLabel(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void
- viewUpcoming(p : ShellPresenter, plans : PlanManager) : void
- createCalendar(p : ShellPresenter, cals : CalendarManager, users : UserManager, logs : LoggingManager, plans : PlanManager, hists : HistoryManager) : void
- deleteCalendar(p : ShellPresenter, cals : CalendarManager, users : UserManager, plans : PlanManager, labs : LabelManager, logs : LoggingManager, hists : HistoryManager, comms : CommentManager) : void
- clearCalendars(p : ShellPresenter, cals : CalendarManager, users : UserManager, plans : PlanManager, logs : LoggingManager, labs : LabelManager, hists : HistoryManager, comms : CommentManager): void
-editDescription(p : ShellPresenter, users : UserManager, cals : CalendarManager, hists : HistoryManager. Logs : LoggingManager) : void
- editName(p : ShellPresenter, users : UserManager, cals : CalendarManager, hists : HistoryManager, logs : LoggingManager) : void
- editSharePermission(p : ShellPresenter, users : UserManager, logs : LoggingManager) : void
- viewAllCalednars(p : ShellPresenter, cals : CalendarManager, users : UserManager, logs : LoggingManager) : void
- viewSharedCalendars(p : ShellPresenter, cals : CalendarManager, users : UserManager, logs : LoggingManager) : void
- editPlans(p : ShellPresenter, cals : CalendarManager, users : UserManager, logs : loggingManager) : void

ShellMenuEditPlan

+ ShellMenuEditPlan(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager)
+ run(p : ShellPresenter) : void
- back() : void
- addEvent(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- addTask(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- addSubevent(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- addSubtask(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- editname(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- editDescription(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- editLabels(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- editTime(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- nestPlan(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- unnestPlan(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- deletePlan(p : ShellPresenter, cals : CalendarManager, plans : PlanManager, labs : LabelManager, comms : CommentManager) : void
- clearTasjs(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- clearEvents(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- viewEvents(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- viewTasks(p : ShellPresenter, cals : CalendarManager, plans : PlanManager) : void
- editComments(p : ShellPresenter, cals : CalendarManager, plans : PlanManager)



<<abstract>>
ShellMenu

+ commands : Map<String, Runnable>
- menu State : MenuState

# setMenuState(menuState : MenuState) : void
# getMenuState() : MenuState
# handelInput(data : ShellData, input : String) : void
+ run(presenter : ShellPresenter) : void

ShellMenuUser

+ ShellMenuUser(p : ShellPresenter, s : InterfaceSaver, plans : PlanManager, cals : CalednarManager, logs : LoggingManager, labs :LabelManager, hists : HistoryManager)
+ run(p : ShellPresenter)
# viewHistory(p : ShellPresenter, logs : LoggingManager, hists : HistoryManager)
# logOut(p : ShellPresenter, s : InterfaceSaver, logs : LoggingManager, hists : HistoryManager) : void
# deleteOwnAccount(p : ShellPresenter, logs : LoggingManager, hists : HistoryManager, cals : CalednarManager, plans : PlanManager, labs : LabelManager, users : UserManager, comms : CommentManager) : void
# editCalendars() : void
# changeUsername(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager) : void
# changePassword(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager) : void
# save(p : ShellPresenter, cals : CalednarManager, plans : PlanManager, labs : LabelManager, users : UserManager, hists : HistoryManager, comms : CommentManager) : void

ShellMenuEditLabelEvent

+ ShellMenuEditLabel(p : ShellPresenter, s : InterfaceSaver, cals : CalendarManager, plans : PlanManager, labs : LabelManager, logs : LoggingManager, hists : HistoryManager)
+ run(p : ShellPresenter, s : InterfaceSaver, hists : HistoryManager, logs : LoggingManager, cals : CalendarManager) : void
- back(p : ShellPresenter) : void
- editLabel(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void
- deleteLabel(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void
- clearLabels(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void
- addThematicalLabel(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void
- viewLabels(p : ShellPresenter, plans : PlanManager, labs : LabelManager) : void

ShellMenuUserAdmin

+ ShellMenuAdminUser(p : ShellPresenter, s : InterfaceSaver, plans : PlanManager, cals : CalendarManager, logs : LoggingManager, labs : LabelManager, users : UserManager, hists : HistoryManager, comms : CommentManager)
+ run(p : ShellPresenter) : void
- newAdminUser(p : ShellPresenter, users : UserManager, plans : PlanManager, cals : CalendarManager, logs : LoggingManager) : void
- banUser(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager) : void
- unbanUser(p : ShellPresenter, users : UserManager, logs : LoggingManager, hists : HistoryManager) : void
- deleteNonAdminAccount(p : ShellPresenter, users : UserManager, plans : PlanManager, cals : CalendarManager, labs : LabelManager, hists : HistoryManager, logs : LoggingManagercomms : CommentManager) : void

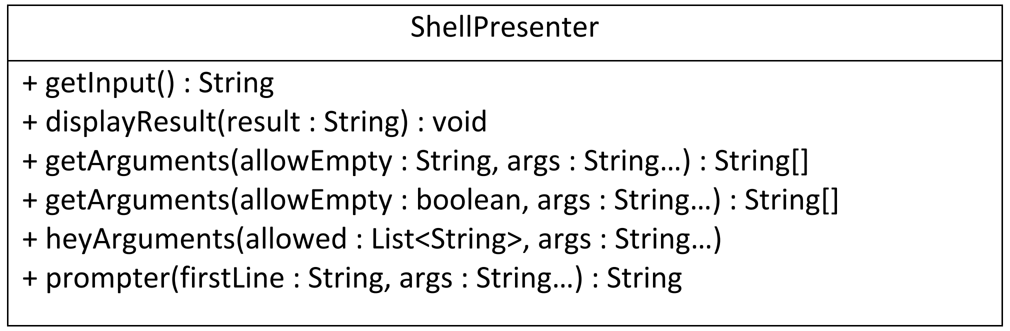
ShellMenuEditLabelTask

+ ShellMenuEditLabelTask(p : ShellPresenter, s : InterfaceSaver, cals : CalendarManager, plans : PlanManager, labs : LabelManager, logs : LoggingManager, hists : HistoryManager)
+ run(p : ShellPresenter)
- setProgressLabel(p : ShellPresenter, plans : PlanManager, labs : LabelManager)

ShellMenuEditComment

+ ShellMenuEditComment(p : ShellPresenter, plans : PlanManager, comms : CommentManager, logs : LoggingManager)
+ run(p : ShellPresenter) : void
- back() : void
- viewComments(p : ShellPresenter, plans : PlanManager, comms : CommentManager) : void
- addComment(p : ShellPresenter, logs : LoggingManager, plans : PlanManager, comms : CommentManager) : void
- editComment(p : ShellPresenter, plans : PlanManager, comms : CommentManager) : void
- deleteComment(p : ShellPresenter, plans : PlanManager, comms : CommentManager) : void
- reply(p : ShellPresenter, plans : PlanManager, comms : CommentManager, logs : LoggingManager) : void
- clearComments(p : ShellPresenter, plans : PlanManager, comms : CommentManager) : void

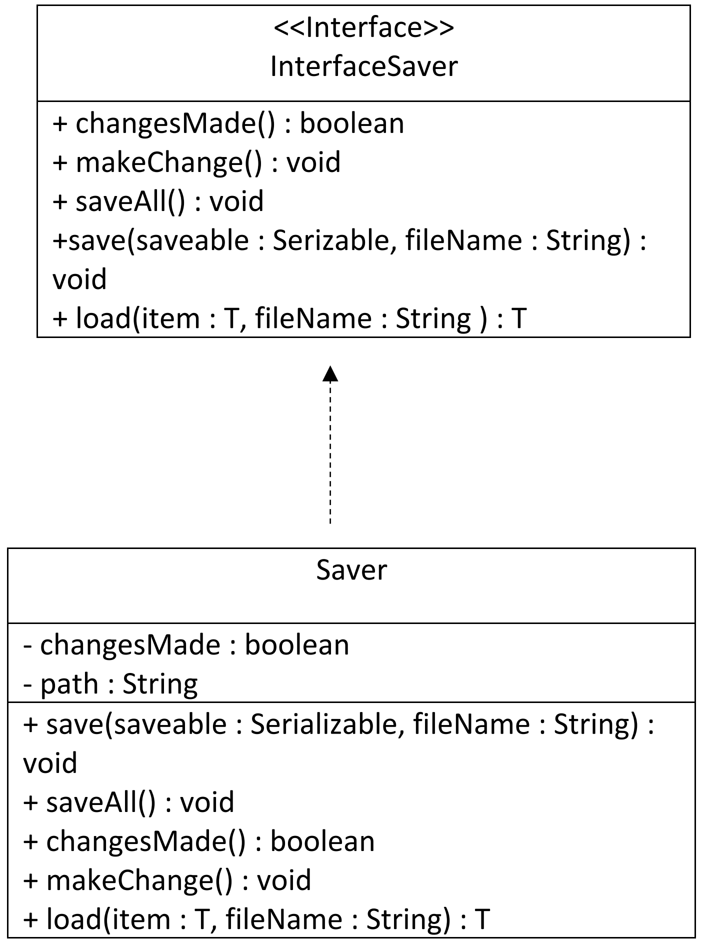
Presenter



ShellPresenter

+ getInput() : String
+ displayResult(result : String) : void
+ getArguments(allowEmpty : String, args : String…) : String[]
+ getArguments(allowEmpty : boolean, args : String…) : String[]
+ heyArguments(allowed : List<String>, args : String…)
+ prompter(firstLine : String, args : String…) : String

GateWay



<<Interface>>
InterfaceSaver

+ changesMade() : boolean
+ makeChange() : void
+ saveAll() : void
+save(saveable : Serizable, fileName : String) : void
+ load(item : T, fileName : String) : T

Saver

- changesMade : boolean
- path : String

+ save(saveable : Serializable, fileName : String) : void
+ saveAll() : void
+ changesMade() : boolean
+ makeChange() : void
+ load(item : T, fileName : String) : T