

Month ::= jan | feb | mar | abr | may | jun | jul | ago | sep | out | nov | dec

Date

year: \mathbb{N}
month: Month
day: 1..31

month $\in \{\text{apr, jun, sep, nov}\} \Rightarrow \text{day} \leq 30$
month = feb $\Rightarrow (\text{day} \leq 28 \vee (\text{day} = 29 \wedge (\text{year mod } 4 = 0 \wedge \text{year mod } 100 \neq 0 \vee \text{year mod } 400 = 0)))$

CharLower ::= {a, b, c, d, ..., y, z}

CharUpper ::= {A, B, C, D, ..., Y, Z}

Numbers ::= {0..9}

Symbols ::= {#, _, @, .}

Char = CharLower $\hat{\cup}$ CharUpper $\hat{\cup}$ Numbers $\hat{\cup}$ Symbols

Letters = CharLower $\hat{\cup}$ CharUpper

User

id: \mathbb{N}
username: seq Char
password: seq Char
email: seq Char
profile: UserProfile

id $\notin \{u.\text{id} \mid u \in \text{users}\}$
username $\neq \langle \rangle$
password $\neq \langle \rangle \wedge \# \text{password} \geq 6$
email $\neq \langle \rangle \wedge '@' \in \text{email} \wedge '.' \in \text{email}$

UserProfile

phone_number: seq Numbers
address: seq Char
birth_date: Date

$8 \leq \# \text{phone_number} \leq 15$
address $\neq \langle \rangle$
birth_date $\leq \text{today}()$

RegisterUser

Δ TaskManager
u?: User

$u?.id \notin \{u.id \mid u \in \text{users}\}$
 $u?.username \neq \langle \rangle$
 $u?.password \neq \langle \rangle \wedge \#u?.password \geq 6$
 $u?.email \neq \langle \rangle \wedge '@' \in u?.email$
 $\text{today}() - u?.profile.birth_date \geq 13 * 365$
 $\text{users}' = \text{users} \cup \{u?\}$

LoginUser

$\Delta \text{TaskManager}$

$u?: \text{User}$

$\text{enteredUsername?}: \text{seq Char}$

$\text{enteredPassword?}: \text{seq Char}$

$\text{enteredUsername?} \neq \langle \rangle$

$\text{enteredPassword?} \neq \langle \rangle$

$\exists u \in \text{users} \bullet$

$u.username = \text{enteredUsername?} \wedge$

$u.password = \text{enteredPassword?} \wedge$

$u? = u$

$u? \notin \text{loggedInUsers}$

$\text{loggedInUsers}' = \text{loggedInUsers} \cup \{u?\}$

LogoutUser

$\Delta \text{TaskManager}$

$u?: \text{User}$

$u? \in \text{loggedInUsers}$

$\text{loggedInUsers}' = \text{loggedInUsers} \setminus \{u?\}$

Task

$\text{id}: \mathbb{N}$

$\text{title}: \text{seq Char}$

$\text{description}: \text{seq Char}$

$\text{dueDate}: \text{Date}$

$\text{priority}: \{\text{Baixa}, \text{Media}, \text{Alta}\}$

$\text{category}: \text{Category}$

$\text{status}: \{\text{N\~ao_Planejada}, \text{Planejada}, \text{Em_Andamento}, \text{Aguardando_Aprova\~ao}, \text{Finalizada}\}$

$\text{owner}: \text{User}$

$\text{created_at}: \text{Date}$

$\text{id} \notin \text{tasks.id}$

$\text{title} \neq \langle \rangle$

$\text{dueDate} \geq \text{today}()$

$\text{status} = \text{N\~ao_Planejada}$

$\text{owner} \in \text{users}$

AddTask

Δ TaskManager

t?: Task

u?: User

$u? \in \text{loggedInUsers}$

$t?.id \notin \text{tasks.id}$

$t?.title \neq \langle \rangle$

$t?.description \neq \langle \rangle$

$t?.category \in \text{Category}$

$t?.dueDate \geq \text{today}()$

$t?.dueDate \geq t?.created_at$

$t?.owner = u?$

$\text{tasks}' = \text{tasks} \cup \{t?\}$

EditTask

Δ TaskManager

t?: Task

u?: User

newTitle?: seq Char

newDescription?: seq Char

newDueDate?: Date

newPriority?: {Baixa, Media, Alta}

newCategory?: Category

newStatus?: {Não_Planejada, Planejada, Em_Andamento, Aguardando_Aprovação, Finalizada}

$t? \in \text{tasks}$

$t?.owner = u?$

$u? \in \text{loggedInUsers}$

$\text{newTitle?} \neq \langle \rangle$

$\text{newDueDate?} \geq \text{today}()$

$\text{newStatus?} \in \{\text{Não_Planejada, Planejada, Em_Andamento, Aguardando_Aprovação, Finalizada}\}$

$\text{tasks}' = (\text{tasks} \setminus \{t?\}) \cup \{t? \bullet$

title := newTitle?,

description := newDescription?,

dueDate := newDueDate?,

priority := newPriority?,

category := newCategory?,

status := newStatus? }

DeleteTask

Δ TaskManager

t?: Task

u?: User

$t? \in \text{tasks}$
 $t?.\text{owner} = u?$
 $u? \in \text{loggedInUsers}$
 $\text{tasks}' = \text{tasks} \setminus \{t?\}$

CompleteTask

$\Delta \text{TaskManager}$
 $t?: \text{Task}$
 $u?: \text{User}$

$t? \in \text{tasks}$
 $t?.\text{owner} = u?$
 $u? \in \text{loggedInUsers}$
 $t?.\text{status} \neq \text{Finalizada}$
 $\text{tasks}' = \text{tasks} \setminus \{t?\}$
 $\text{archivedTasks}' = \text{archivedTasks} \cup \{t? \bullet \text{status} := \text{Finalizada}\}$

AddCategory

$\Delta \text{TaskManager}$
 $c?: \text{Category}$
 $u?: \text{User}$
 $u? \in \text{loggedInUsers}$

$c?.\text{id} \notin \text{categories.id}$
 $c?.\text{name} \neq \langle \rangle$
 $\text{categories}' = \text{categories} \cup \{c?\}$

DeleteCategory

$\Delta \text{TaskManager}$
 $c?: \text{Category}$
 $u?: \text{User}$
 $u? \in \text{loggedInUsers}$
 $c? \in \text{categories}$

$c? \in \text{categories}$
 $\text{tasks}' = \{t: \text{tasks} \mid t.\text{category} \neq c?.\text{name}\}$
 $\text{categories}' = \text{categories} \setminus \{c?\}$

Category

$\text{id}: \mathbb{N}$
 $\text{name}: \text{seq Char}$

$\text{id} \notin \text{categories.id}$
 $\text{name} \neq \langle \rangle$

Notification

task: Task
message: seq Char
sent_at: Date

task \in tasks
message $\neq \langle \rangle$
sent_at = today()

SendNotifications

Δ TaskManager
t?: Task
n!: Notification

t? \in tasks
daysLeft = t?.dueDate - today()
daysLeft ≤ 1
n! = • task := t?, message := "Prazo próximo!", sent_at := today()
notifications' = notifications \cup {t?}

TaskManager

users: \mathbb{P} User
loggedInUsers: \mathbb{P} User
tasks: \mathbb{P} Task
archivedTasks: \mathbb{P} Task
notifications: \mathbb{P} Notification

users $\neq \emptyset$
loggedInUsers \subseteq users
tasks \cap archivedTasks = \emptyset
 $\forall n \in \text{notifications} \bullet n.\text{task} \in \text{tasks}$

KanbanView

nonPlannedTasks: \mathbb{P} Task
plannedTasks: \mathbb{P} Task
inProgressTasks: \mathbb{P} Task
waitingApprovalTasks: \mathbb{P} Task
finishedTasks: \mathbb{P} Task

nonPlannedTasks = {t: Task | t.status = Não_Planejada}
plannedTasks = {t: Task | t.status = Planejada}
inProgressTasks = {t: Task | t.status = Em_Andamento}

waitingApprovalTasks = {t: Task | t.status = Aguardando_Aprovação}
finishedTasks = {t: Task | t.status = Finalizada}
