

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

Date

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

month \in {apr, jun, sep, nov} \Rightarrow day \leq 30
month = feb \Rightarrow (day \leq 28 \vee (day = 29 \wedge (year mod 4 = 0 \wedge year mod 100 \neq 0
 \vee 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.id | u \in users}
username \neq $\langle \rangle$
password \neq $\langle \rangle \wedge$ #password \geq 6
email \neq $\langle \rangle \wedge$ '@' \in email

UserProfile

phone_number: seq Numbers
address: seq Char
birth_date: Date

8 \leq #phone_number \leq 15
address \neq $\langle \rangle$
birth_date < 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

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

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

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

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

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

$\text{category}: \{\text{Trabalho}, \text{Estudo}, \text{Pessoal}\}$

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

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

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

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

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

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

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

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

AddTask

Δ TaskManager

t?: Task

u?: User

$u? \in \text{loggedInUsers}$

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

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

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

$t?.category \in \{\text{Trabalho, Estudo, Pessoal}\}$

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

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

$t?.owner = u?$

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

EditTask

Δ TaskManager

t?: Task

u?: User

newTitle?: seq Char

newDescription?: seq Char

newDueDate?: Date

newPriority?: {Baixa, Media, Alta}

newCategory?: {Trabalho, Estudo, Pessoal}

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

$t? \in \text{tasks}$

$t?.owner = u?$

$u? \in \text{loggedInUsers}$

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

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

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

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

$\text{title} := \text{newTitle?},$

$\text{description} := \text{newDescription?},$

$\text{dueDate} := \text{newDueDate?},$

$\text{priority} := \text{newPriority?},$

$\text{category} := \text{newCategory?},$

$\text{status} := \text{newStatus?} \}$

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

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

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

Notification

$\text{task}: \text{Task}$
 $\text{message}: \text{seq Char}$
 $\text{sent_at}: \text{Date}$

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

SendNotifications

$\Delta \text{TaskManager}$
 $t?: \text{Task}$
 $n!: \text{Notification}$

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

TaskManager

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

$\text{users} \neq \emptyset$
 $\text{loggedInUsers} \subseteq \text{users}$
 $\text{tasks} \cap \text{archivedTasks} = \emptyset$

tasks ∪ archivedTasks = ∅
∀ n ∈ notifications • n.task ∈ 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}