TaskManager

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

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users $\neq \emptyset$
loggedInUsers $\subseteq$ users
tasks $\cap$ archivedTasks $= \emptyset$
$\forall$ n $\in$ notifications • n.task $\in$ tasks

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

Date

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

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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 $\frown$ CharUpper $\frown$ Numbers $\frown$ Symbols
Letters = CharLower $\frown$ CharUpper

User

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

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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
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$8 \leq$ #phone_number ≤ 15
address $\neq \langle\rangle$
birth_date $<$ today()

RegisterUser _____

Δ TaskManager
u?: User
___

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

LoginUser _____

Δ TaskManager
u?: User
enteredUsername?: seq Char
enteredPassword?: seq Char
___

enteredUsername? $\neq \langle\rangle$
enteredPassword? $\neq \langle\rangle$
$\exists$ u $\in$ users •
   u.username = enteredUsername? $\wedge$
   u.password = enteredPassword? $\wedge$
   u? = u
u? $\notin$ loggedInUsers
loggedInUsers' = loggedInUsers $\cup$ {u?}

LogoutUser _____

Δ TaskManager
u?: User
___

u? $\in$ loggedInUsers
loggedInUsers' = loggedInUsers \ {u?}

Task _____

id: $\mathbb{N}$
title: seq Char
description: seq Char
dueDate: Date
priority: {Baixa, Media, Alta}

category: {Trabalho, Estudo, Pessoal}
status: {Não_Planejada, Planejada, Em_Andamento,
Aguardando_Aprovação, Finalizada}
owner: User
created_at: Date

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id ∉ tasks.id
title ≠ ⟨⟩
dueDate ≥ today()
status = Não_Planejada
owner ∈ users

AddTask

Δ TaskManager
t?: Task
u?: User

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u? ∈ loggedInUsers
t?.id ∉ tasks.id
t?.title ≠ ⟨⟩
t?.description ≠ ⟨⟩
t?.category ∈ {Trabalho, Estudo, Pessoal}
t?.dueDate ≥ today()
t?.dueDate ≥ t?.created_at
t?.owner = u?
tasks' = tasks ∪ {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}

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t? ∈ tasks
t?.owner = u?

u? ∈ loggedInUsers

newTitle? ≠ ⟨⟩
newDueDate? ≥ today()
newStatus? ∈ {Não_Planejada, Planejada, Em_Andamento,
Aguardando_Aprovação, Finalizada}

$tasks' = (tasks \setminus \{t?\}) \cup \{ t? \bullet$
  $title := newTitle?,$
  $description := newDescription?,$
  $dueDate := newDueDate?,$
  $priority := newPriority?,$
  $category := newCategory?,$
  $status := newStatus? \}$

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DeleteTask

Δ TaskManager
$t?$: Task
$u?$: User

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

___

CompleteTask

Δ TaskManager
$t?$: Task
$u?$: User

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

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Notification

task: Task
message: seq Char
sent_at: Date

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

___

SendNotifications

Δ TaskManager

$t?$: Task
$n!$: Notification

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$t? \in tasks$
$daysLeft = t?.dueDate - today()$
$daysLeft \leq 1$
$n! = \quad task := t?, \quad message := "Prazo próximo", \quad sent\_at := today()$

n! = • task := t?, message := "Prazo próximo!", sent_at := today()
notifications' = notifications ∪ {t?}

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KanbanView _____

nonPlannedTasks: ℙ Task
plannedTasks: ℙ Task
inProgressTasks: ℙ Task
waitingApprovalTasks: ℙ Task
finishedTasks: ℙ Task

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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}