

Personal Task Management System - Operation Contracts.

1. Create Task

Element	Description
Operation	createTask(title: String, description: String, priority: PriorityLevel, dueDate: Date)
Pre-conditions	None.
Post-conditions	<ul style="list-style-type: none">• A new Task instance <i>t</i> was created.• <i>t.title</i> was initialized to title.• <i>t.description</i> was initialized to description.• <i>t.priority</i> was initialized to priority.• <i>t.dueDate</i> was initialized to dueDate.• <i>t.creationDate</i> was initialized to the current date/time.• <i>t.status</i> was initialized to 'open'.• A new ActivityEntry instance <i>a</i> was created.• <i>a.timestamp</i> was initialized to the current date/time and <i>a.description</i> was initialized to indicate creation.• An association was formed between <i>t</i> and <i>a</i>.

2. Create Project

Element	Description
Operation	createProject(name: String, description: String)
Pre-conditions	A Project with the given name does not already exist.
Post-conditions	<ul style="list-style-type: none">• A new Project instance <i>p</i> was created.• <i>p.name</i> was initialized to name.• <i>p.description</i> was initialized to description.

3. Update Task

Element	Description
Operation	updateTask(taskId: ID, title: String, description: String, priority: PriorityLevel, dueDate: Date, status: StatusType)
Pre-conditions	A Task <i>t</i> with taskId exists in the system.
Post-conditions	<ul style="list-style-type: none">• <i>t.title</i> was updated to title.• <i>t.description</i> was updated to description.• <i>t.priority</i> was updated to priority.• <i>t.dueDate</i> was updated to dueDate.• <i>t.status</i> was updated to status (can be open, completed, or cancelled).• A new ActivityEntry instance <i>a</i> was created to log the update.• An association was formed between <i>t</i> and <i>a</i>.

4. Assign Task to Project

Element	Description
Operation	assignTaskToProject(taskId: ID, projectId: ID)
Pre-conditions	A Task t with taskId exists and is not currently associated with a project. A Project p with projectId exists.
Post-conditions	<ul style="list-style-type: none">• An association was formed between t and p.• A new ActivityEntry instance a was created to log the project assignment.• An association was formed between t and a.

5. Move Task to Another Project

Element	Description
Operation	moveTaskToAnotherProject(taskId: ID, newProjectId: ID)
Pre-conditions	A Task t with taskId exists and is already associated with a project. A Project new_p with newProjectId exists.
Post-conditions	<ul style="list-style-type: none">• The association between t and its previous Project was broken.• An association was formed between t and new_p.• A new ActivityEntry instance a was created to log the project movement.• An association was formed between t and a.

6. Remove Task from Project

Element	Description
Operation	removeTaskFromProject(taskId: ID)
Pre-conditions	A Task <i>t</i> with taskId exists and is associated with a Project.
Post-conditions	<ul style="list-style-type: none">• The association between <i>t</i> and its current Project was broken.• A new ActivityEntry instance <i>a</i> was created to log the removal.• An association was formed between <i>t</i> and <i>a</i>.

7. Add Subtask

Element	Description
Operation	addSubtask(taskId: ID, title: String)
Pre-conditions	A Task <i>t</i> with taskId exists.
Post-conditions	<ul style="list-style-type: none">• A new Subtask instance <i>s</i> was created.• <i>s.title</i> was initialized to title.• <i>s.status</i> was initialized to 'open' (or incomplete).• An association was formed between Task <i>t</i> and Subtask <i>s</i>.

8. Update Subtask Status

Element	Description
Operation	updateSubtaskStatus(subtaskId: ID, status: SubtaskStatusType)
Pre-conditions	A Subtask <i>s</i> with subtaskId exists.
Post-conditions	<ul style="list-style-type: none">• <i>s.status</i> was updated to status.• (Note: As per requirements, completing all subtasks does NOT automatically update the parent task's status).

9. Delete Subtask

Element	Description
Operation	deleteSubtask(subtaskId: ID)
Pre-conditions	A Subtask <i>s</i> with subtaskId exists.
Post-conditions	<ul style="list-style-type: none">• The Subtask instance <i>s</i> was destroyed.• The association between its parent Task and the Subtask <i>s</i> was broken.

10. Add Tag to Task

Element	Description
Operation	addTagToTask(taskId: ID, tagName: String)
Pre-conditions	A Task <i>t</i> with taskId exists.

Post-conditions	<ul style="list-style-type: none"> • If a Tag <i>tg</i> with tagName does not exist, a new Tag <i>tg</i> was created and <i>tg.name</i> was initialized to tagName. • If a Tag <i>tg</i> with tagName already exists, <i>tg</i> is retrieved. • An association was formed between Task <i>t</i> and Tag <i>tg</i>. • A new ActivityEntry instance <i>a</i> was created to log the tag addition. • An association was formed between <i>t</i> and <i>a</i>.
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11. Remove Tag from Task

Element	Description
Operation	removeTagFromTask(taskId: ID, tagName: String)
Pre-conditions	A Task <i>t</i> with taskId exists and is associated with a Tag <i>tg</i> named tagName.
Post-conditions	<ul style="list-style-type: none"> • The association between Task <i>t</i> and Tag <i>tg</i> was broken. • A new ActivityEntry instance <i>a</i> was created to log the tag removal. • An association was formed between <i>t</i> and <i>a</i>.