
Assignment 5

TASK 1 – OPERATIONAL PATTERN

OPERATION: CREATEAPPOINTMENT

SECTION

CONTENT FOR CREATEAPPOINTMENT

DESCRIPTION

A TUTOR ATTEMPTS TO CREATE A NEW APPOINTMENT SLOT.

- IF THE TUTOR ISN'T REGISTERED, THE REQUEST IS **REJECTED** WITH "TUTOR NOT REGISTERED".
- IF THE REQUESTED TIME AND DURATION **CONFLICTS** WITH AN EXISTING SLOT, THE REQUEST IS **REJECTED** WITH "SLOT CONFLICT".
- OTHERWISE, A NEW APPOINTMENT IS CREATED:
 - LINKED TO THE TUTOR.
 - SCHEDULED AT THE SPECIFIED DATE AND DURATION.
 - LOCATED AT THE SPECIFIED LOCATION.

INPUT

- TUTOREMAIL: STRING
- DATETIME: DATETIME
- DURATION: \mathbb{N}
- LOCATION: STRING

READS

- HA: HANDLEAPPOINTMENTS (MAIN CONTROL)
- HT: HANDLETUTORS, WITH $(HA, HT) \in \text{COMMUNICATES}_3$
- TD: TUTORDATA, WHERE $TD.EMAIL = TUTOREMAIL \wedge (TD, HT) \in \text{MANAGES}_3$
- ASSIGNEDTO $\subseteq \text{APPOINTMENT} \times \text{TUTORDATA}$
- SCHEDULEDSLOT $\subseteq \text{APPOINTMENT} \times (\text{DATETIME} \times \mathbb{N})$
- LOCATIONOF $\subseteq \text{APPOINTMENT} \times \text{STRING}$

CHANGES

IF THE APPOINTMENT IS SUCCESSFULLY CREATED:

- A NEW APPOINTMENT A_NEW IS ALLOCATED WITH A UNIQUE ID.
 - $ASSIGNEDTO' = ASSIGNEDTO \cup \{ (A_NEW, TD) \}$
 - $SCHEDULEDSLOT' = SCHEDULEDSLOT \cup \{ (A_NEW, (DATETIME, DURATION)) \}$
 - $LOCATIONOF' = LOCATIONOF \cup \{ (A_NEW, LOCATION) \}$
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SENDS

TO TUTOR \rightarrow

- "TUTOR NOT REGISTERED"
- "SLOT CONFLICT"
- "APPOINTMENT CREATED"

PRECONDITIONS

- IMPLICIT (TYPE/DOMAIN CONSTRAINTS)

POSTCONDITIONS

LET:

- $TUTOR EXISTS \triangleq TUTOR EMAIL \in \text{DOM } HT.TUTORS$
- $CONFLICT \triangleq \exists A: APPOINTMENT \bullet (A, TD) \in \text{ASSIGNEDTO} \wedge \text{OVERLAPS}(\text{SCHEDULEDSLOT}(A), (DATE TIME, DURATION)) \wedge \text{LOCATIONOF}(A) = \text{LOCATION}$

THEN:

- IF $\neg TUTOR EXISTS \rightarrow$
 - $IS_SENT \{ "TUTOR NOT REGISTERED" \}$
 - **NO EFFECT**
- IF $TUTOR EXISTS \wedge CONFLICT \rightarrow$
 - $IS_SENT \{ "SLOT CONFLICT" \}$
 - **NO EFFECT**
- IF $TUTOR EXISTS \wedge \neg CONFLICT \rightarrow$
 - **UNIQUE ID** A_NEW
 - $IS_SENT \{ "APPOINTMENT CREATED" \}$
 - $ASSIGNEDTO' = ASSIGNEDTO \cup \{ (A_NEW, TD) \}$
 - $SCHEDULEDSLOT' = SCHEDULEDSLOT \cup \{ (A_NEW, (DATE TIME, DURATION)) \}$
 - $LOCATIONOF' = LOCATIONOF \cup \{ (A_NEW, LOCATION) \}$

Task2

