

# CSE 400 Midterm

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## I. QUESTION (20 POINTS)

Draw a use case diagram for a ticket distributor for the bus-metro system in Istanbul. The system includes two actors: a traveler who purchases different types of tickets, and a central computer system that maintains a reference database for the tariff. Use cases should include *BuyIstanbulCard*, *FillIstanbulCard*, *BuyIkiGec*, *BuyBesGec*, *BuyOnGec*, and *UpdateTariff*. Also include the following exceptional cases: *TimeOut*, *TransactionAborted*, *DistributorOutOfChange*, and *DistributorOutOfCard*.

## II. QUESTION (20 POINTS)

Describe the *FillIstanbulCard* use in detail. Include also exceptional cases. Write the event flows, entry conditions, exit conditions, and participating actors, etc.

## III. QUESTION (20 POINTS)

Draw a sequence diagram for the *FillIstanbulCard* use case.

## IV. QUESTION (20 POINTS)

Consider a traffic light system at a four-way crossroads (two roads intersecting at right angles). Assume the simplest algorithm for cycling through the lights (e.g., all traffic on one road is allowed to go through the crossroad, while the other traffic is stopped). Identify the states of this system and draw a statechart describing them. Remember that each individual traffic light has three states (green, yellow, and red).

## V. QUESTION (20 POINTS)

Design a class diagram for the following object model: A *League* consists of multiple *tournaments*, where a *tournament* contains multiple *rounds*. A *player* can play in multiple *tournaments* and of course a *tournament* is possible only with multiple *players*. Assume *League*, *Tournament*, *Player* and *Round* have a name attribute and a unique identifier. Additionally, *Tournament* and *Round* have start and end date attributes.