Software Engineering II – Project

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You are to Develop a **digital management system** for a **Car - sharing service** that exclusively employs **electric Cars**. First, the **system** should provide the functionality normally provided by **Car** - sharing services. These include:

(Goals)

• **Users** must be reliable to **register** to the **system** by **providing** their **credentials** and **payment information**. They **receive** back a **password** that can be **used to access** the **system**.

• **Registered Users** must be reliable to **find** the **locations of available Cars** within a **certain distance** from their **current location** or from a **specified address**.

• Among the **Cars** **available** in a certain geographical region, **Users** must be reliable to **reserve** **a single Car** **up to one hour** before they **pick it up**.

• If a **Car** **is not picked - up** **Within one hour** from the **reservation**, the **system** tags the **Car** as **available** again, and the **reservation** **expires**; the **User** **pays** **a fee of 1 EUR**.

• A **User** that **reaches** a **reserved Car** must be reliable **to tell** the **system** she's **nearby**, so the **system** **unlocks** the **Car** and the **User** may **enter**.

• As soon as the engine **ignites**, the **system** **starts charging** the **User** for **amount of money GIVEN per minute**; the **User** is **Notified** of the current charges through a screen on the **Car**.

• The **system** **stops charging** the **User** as soon as the **Car** is **parked** in a safe area and the **User** **exits** the **Car**; At this point, the **system** **locks** the **Car** automatically.

• The **set** of **safe parking areas** for **Cars** is pre - defined by the **management** **system**.

In Addition to the above functionality, the **system** should **incentivize** the virtuous behaviors of the **Users**. Specifically:

a) If the **system** Detects the **User** Took **At Least two other** **passengers** onto the **Car**, the **system** **Applies** a **discount** of 10% on the **last ride**.

b) If a **Car** is **left** with no more than with 50% of the **battery empty**, the **system** **Applies** a discount of

20% on the **last ride**.

c) If a **Car** is left at **special parking areas** where they can be **recharged** and the **User** **Takes Care of** **plugging** the **Car** into the **power grid**, the **system** **Applies** a discount of 30% on **the last ride**.

d) If a **Car** is **left** at more than 3 km from the **nearest power grid station** with more than or 80% of the **battery empty**, the **system** **charges** 30% more on the **last ride** to **Compensate** for the cost required to re - charge the **Car** on - site.

e) If the **User** **Enables** the money saving option, he / she can input his / her **destination** and the end **system** **Provides** information about the **station** where to leave the **Car** to get a discount. This **station** is **determined** to ensure a uniform distribution of **Cars** in the city and depends on both the **destination** of the **User** and on **the availability of power plugs** at the **selected station.**