

**SYS466 Summer 2017**  
**Assignment 1: Bicycle Sharing Service Behavioral**  
**Modeling**  
**Due: June 16, 2017 11:59 PM**

***This is a group assignment. You have been assigned to a group and you can find out your group number and team members by logging to Blackboard of please ask your Professor if in doubt.***

**Objective: To create a family of analysis artifacts which document a given use case**

With your assigned group, consider the following case study.

*Your firm has been selected to design a system to manage a bike sharing system owned and operated by a municipality. A fleet of bicycles have been purchased and will be parked in lots across the region. Each bicycle is equipped with an electronic combination lock, location tracker, and credit card reader. A bicycle parking lot has a self-service kiosk which residents can use to reserve bicycles and accept new memberships. The kiosk functionality will be available via the municipality's website and mobile app. Note the following information gathered by the analyst thus far.*

- *Most users are charged an hourly rental rate. The actual rate is dependent on the class of user ○ **Local Resident**, [Adult, Child (under 16), Senior (over 50)] ○ **Tourist**  
..and the type of bike ○ **Street**  
**Bike** ○  
**Mountain Bike***
- *Local residents have the option to obtain a “frequent user” membership. These users pay a monthly fee for unlimited riding.*
- *All users can maintain an account which can be “topped up” if they choose.*
- *The municipality is divided into regions. Each parking lot is located in a region. Multiple lots can reside in any given region. Any bike rented from a particular lot must be returned to some lot in that same region.*
- *The distance travelled during a bike rental will be stored by the solution*
- *Users can reserve a bike up to 15 minutes before the intended rental time. Users do not have to reserve a bike. One can look for unreserved bicycles and rent them on the spot.*
- *Reservations are for a fixed time, if a user doesn't return the bike on time, an hourly late fee is added to the rental cost. To ensure that bike are returned on-time and available for other customers, this charge will occur even if the user has a “frequent user” membership, Payment in full is required when the bicycle is returned. Payment can be made using credit/debit card, Paypal, an e-wallet service like ApplePay or a user account.*

- *Before renting a bicycle, a \$500 refundable deposit is required for tourists. This can be paid by credit card at the time of rental or one can keep the deposit “on file”*

- *When a reservation is made, the user is provided with a code to unlock the bike and an estimated cost*
- *The amount owed can be deducted from the deposit (if one was required) or the payment in full is made and any deposit is returned*
- *Local residents setup local customer accounts via the web or mobile application. Address and age verification cannot be done at the parking lot kiosks. Local residents can rent bicycles but if they have not set up a local customer account, they will be charged at “tourist” rate.*

**Tasks your group needs to accomplish:**

**Step 1:** Create a single UML Use Case Diagram which contains all the following use cases:

- Rent A Bike
- Return A Bike
- Add Bike To Fleet

**Step 2:** Use case description

Use the template below to create your detailed use case description.

Use case:

Precondition:

Postcondition:

Actor (User)	System	Data/Concept used

**Step 3:** Create a UML Swimlane Activity Diagram *for Each use case* using StarUML

**Step 4:** Create A UML System-Level Sequence Diagram *for Each Scenario* using StarUML.

**Submission Instructions**

Your group should submit the following to Blackboard as a group.

1. A document in pdf format containing the scenario descriptions. The associated UML diagrams should be exported and included in this file. The file should be in the format **Group##\_Ass1.pdf** (for example Group08\_Ass1.pdf )

2. A SINGLE UML FILE....in the format **Group##\_Ass1.uml**. (for example Group08\_Ass1.uml )

NOTE: Submit the file requested in the format specified. DO NOT HAND IN COMPRESSED FILES IN ZIP OR RAR FORMAT!!

### Marking Criteria

1. UML use case diagram 5%
2. Activity Diagrams – Does it illustrate the scenario descriptions? Were conventions in class used? 30%
3. Scenario – does it accurately model the use case? Is it consistent with the information given? 30%
4. System-level Sequence Diagrams – Does it illustrate the scenario descriptions? Were conventions in class used? 30%
5. Presentation (files in proper format, documents/diagrams all have contributing members names on them along with what they did on the assignment, submissions are professional looking) 5%