SYS466 Summer 2017
Assignment 2: Bicycle Sharing Service
Structural Modelling
Due Date: July 7, 2017

This is a group assignment which is to be completed in groups of 2 or 3

Objective: To create a domain model which documents a given use case

Step 1: With your assigned group, consider the following case study (same as assignment 1).

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 has 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. User do not have to reserve a bike. She can browse a lot 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 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 "tourist" rate.*

Step 1: Create a single UML Class Diagram for the given case.   Ensure *all associations are labelled and multiplicities are indicated as specified using conventions found in the course materials*. You may use the concepts of *composition* and *generalization* if it helps model your real world. **Finally, add the full names of each student directly in the class diagram**.

The case study may include ambiguous or incomplete information. As a system analyst, you can make assumptions where appropriate as long as they are documented. Use the UML annotation note symbol in the diagram to include any relevant assumptions that you have made.

Submission Instructions

Your group should submit the following to Blackboard.

1. A SINGLE UML FILE….in the format **Group##_Ass2.uml**. (for example Group08_Ass2.uml)

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

Marking Criteria

1. Entity Classes – do they accurately model the system being described? Are they consistent with the information given? Are all relevant conceptual classes included? 40%
2. Associations – are names and multiplicities accurately describe relationships between classes? 55%
3. Presentation (files in proper format, documents/diagrams all have contributing members' names on them, submissions are professional looking) 5%