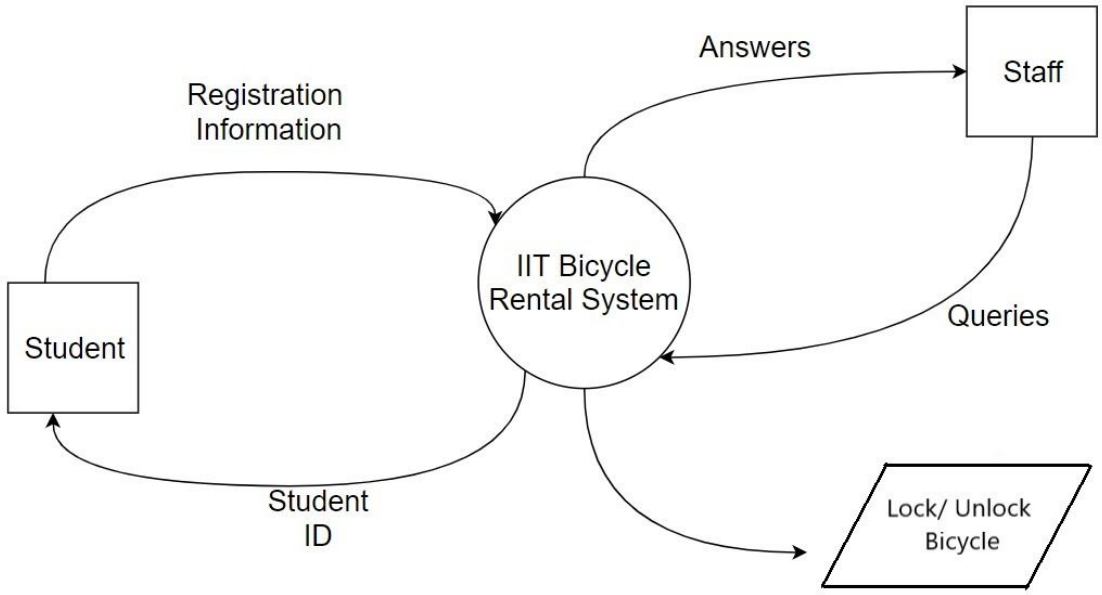
ASSIGNMENT 1

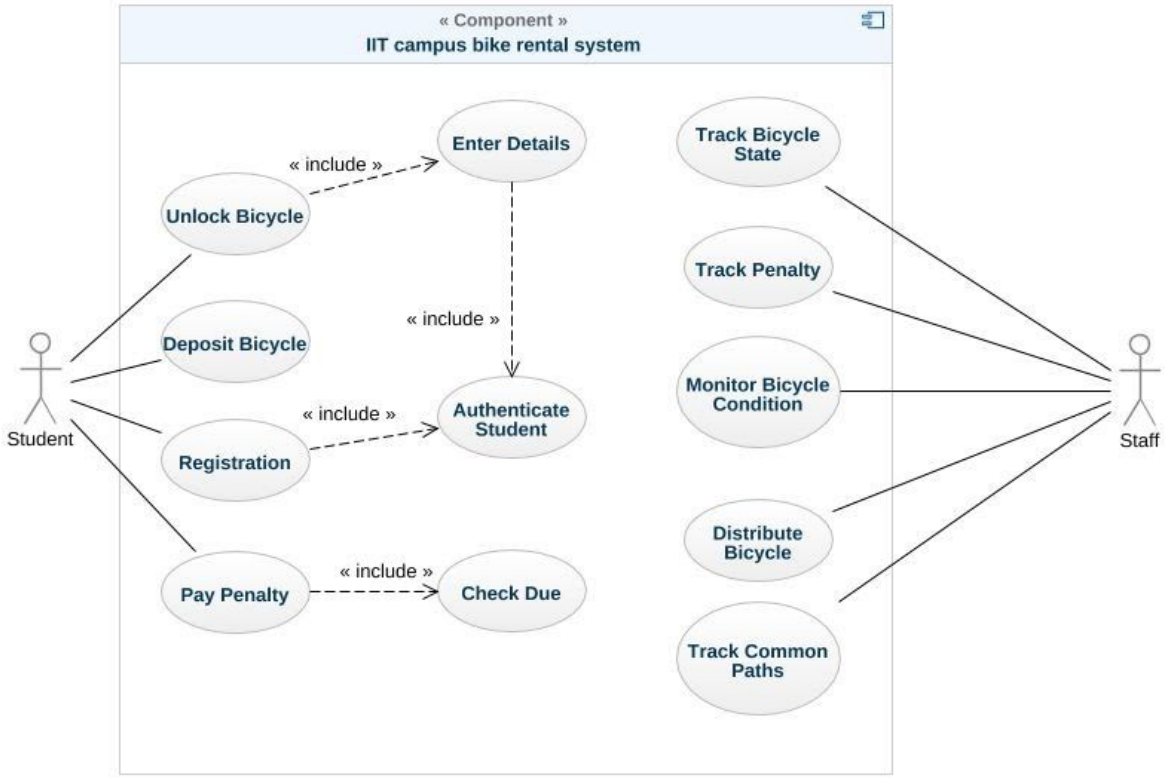
1.Context Diagram:

A context diagram shows external entities, data input to the system by them, output data generated by the system. The context diagram is also called level 0 DFD.

System: Bicycle Rental System
Entities: Student, Staff.
Output: Lock/Unlock Bicycle.



2.Use Case Diagram:



Use Cases Description:

Use case 1: Unlock Bicycle

In this use case student can unlock the bicycle by entering the credentials

Use case 2: Deposit Bicycle

In this use case student returns the bicycle after using it. A student selects an empty place in a deposit and returns the bicycle. No interaction with the keyboard/screen should be needed for return.

Use case 3: Registration

In this use case student register itself to get the unique id

Use case 4: Pay Penalty

In this use case when the student returns the bicycle he/she has to pay the rent and the dues.

Use case 5: Track Bicycle State

In this use case staff will track the bicycle

Use case 6: Track penalty

The staff is supposed to maintain all the payment records of the student in order to calculate dues or fines if any

Use case 7:Monitoring Bicycle Condition

In this use case, the staff is supposed to check if the bicycle is not used for many days then it may be broken. A bicycle needs maintenance.

Use case 8: Distribute Bicycle

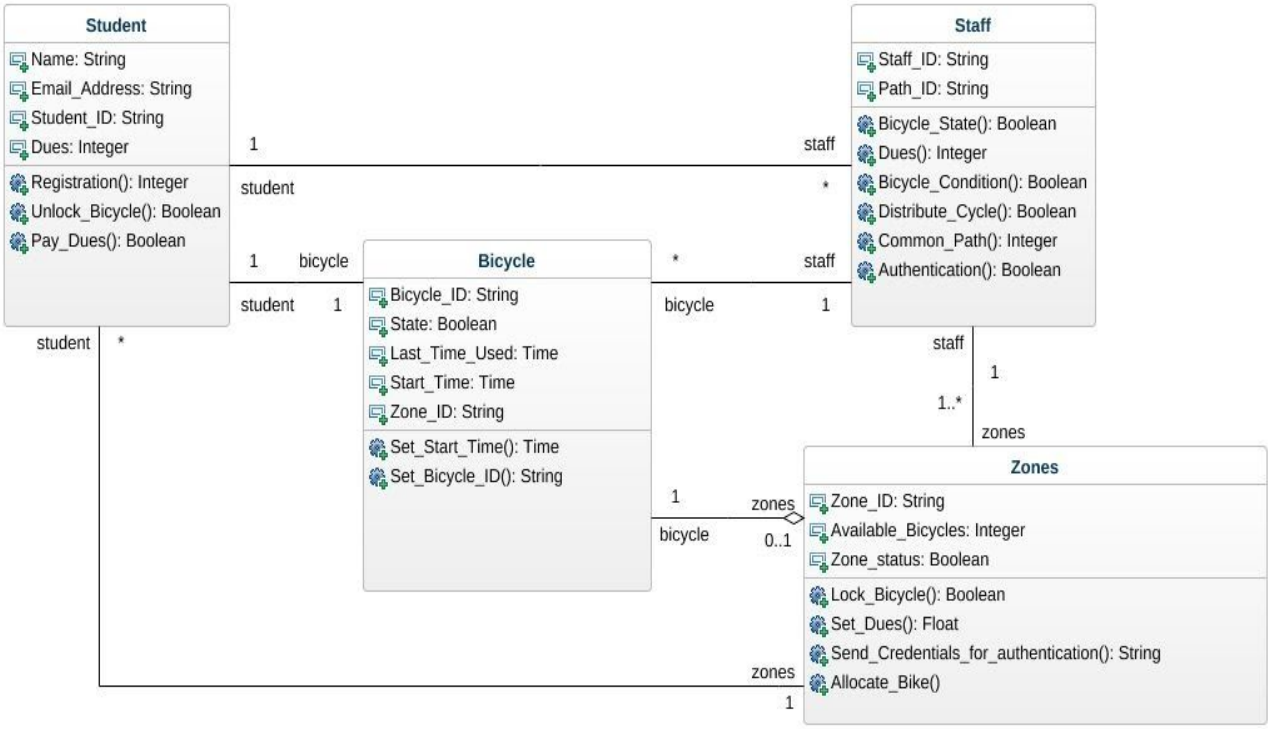
The staff checks the zones if they are used frequently and the bicycle needs to be distributed in an even manner.

Use case 9: Track Common Paths

Staff is tracking all the zones which are always crowded that is they are utilized more. Such zones should be availed with more number of bicycles and should always be full. The staff sets the zone status variable as busy in the zone which helps to track the busiest zones in the campus.

3. Class Diagram:

Describes the static structure of a system. Entities with common features, i.e. attributes and operations. Classes are represented as solid outline rectangle with compartments. Compartments for name, attributes, and operations. Attribute and operation compartments are optional depending on the purpose of a diagram.

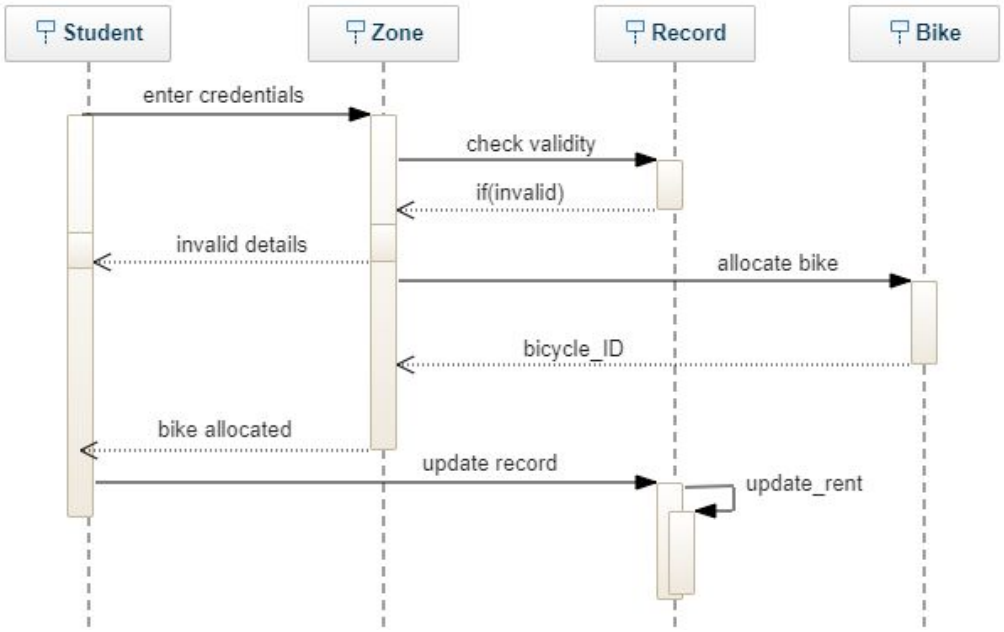


4.Sequence Diagram:

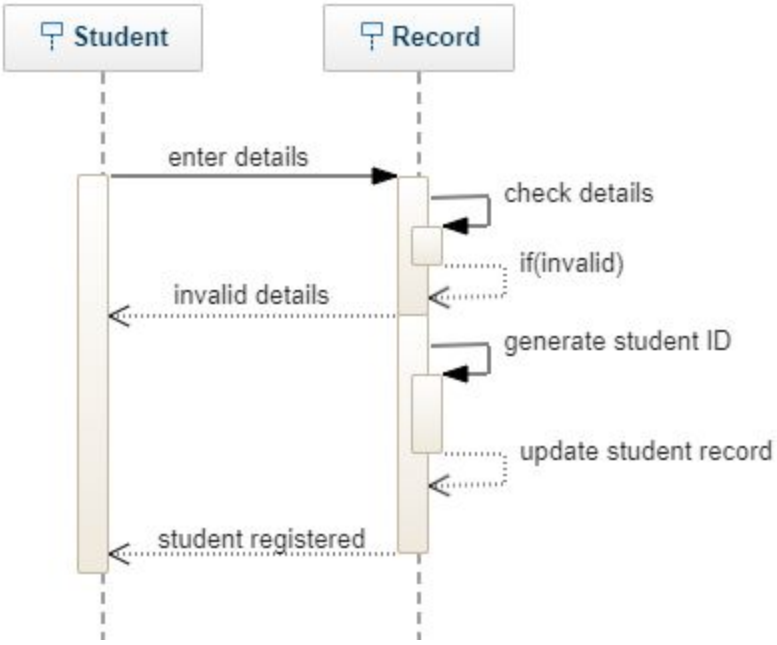
Objects participating in an interaction are shown at the top. For each object, a vertical bar represents its lifeline. Message from an object to another, represented as a labeled arrow. If a message sent under some condition, it can be specified in the bracket. Time increases downwards, ordering of events is captured.

Sequence Diagram 1: Unlock Bicycle:

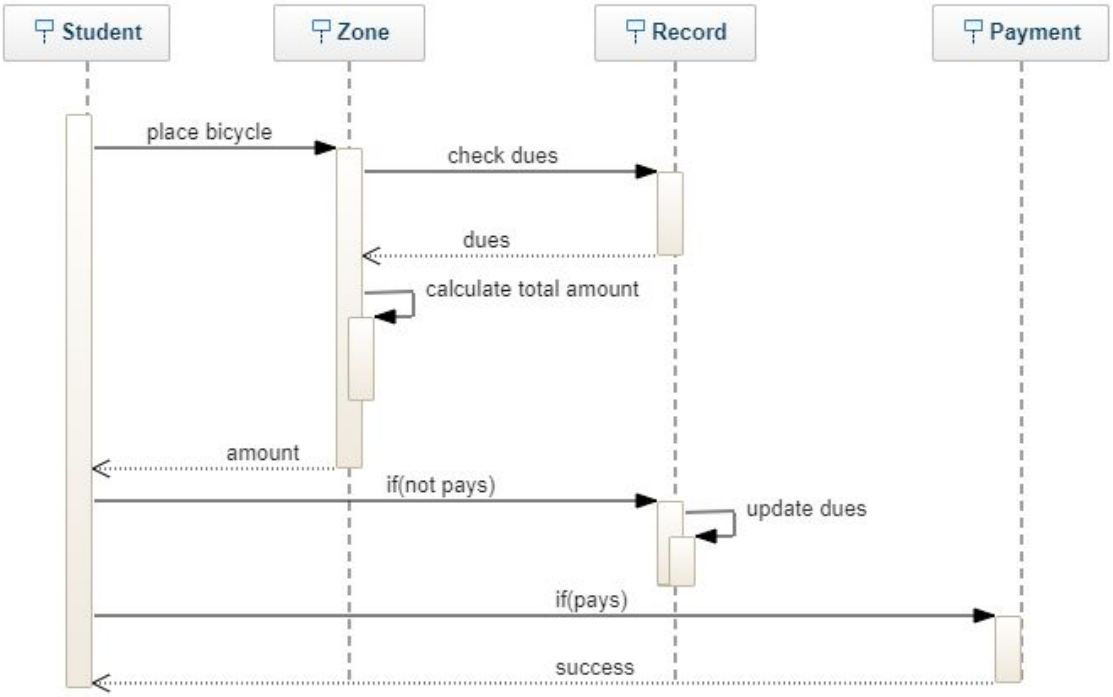
Objects Used: Student, Zone, Record, Bicycle.



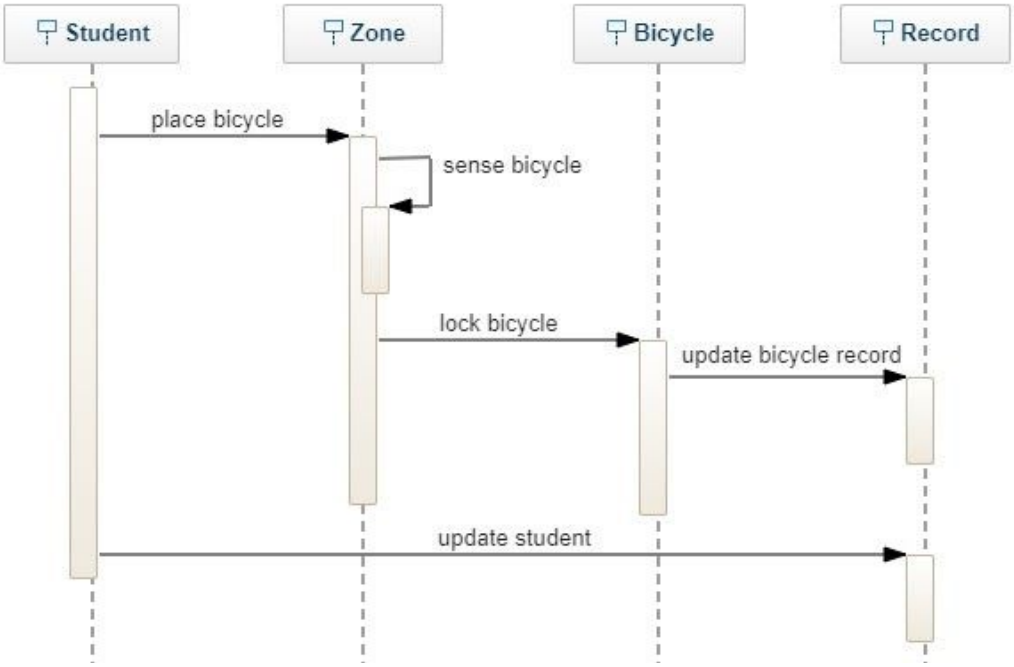
Sequence Diagram 2: Registration:
Objects Used: Student, Record



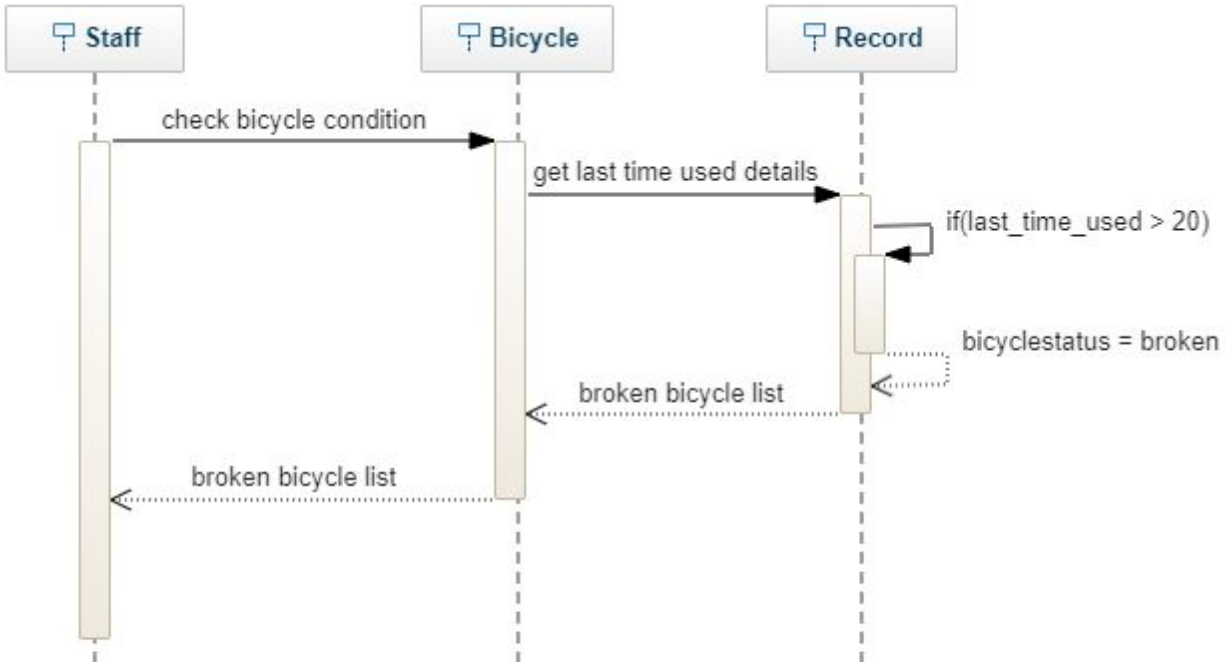
Sequence Diagram 3: Pay Fine
Objects Used: Student, Zone, Records, Payment



Sequence Diagram 4: Lock Bicycle
Objects Used: Student, Zone, Bicycle, Records



Sequence Diagram 5: Check Bicycle Condition:
Objects Used: Staff, Bicycle, Records.



Sequence Diagram 6: Distribute Bicycle:
Objects Used: Staff, Bicycle, Zone