CSCI 4448 HW 4
Josh Wepman and Kyle Poole
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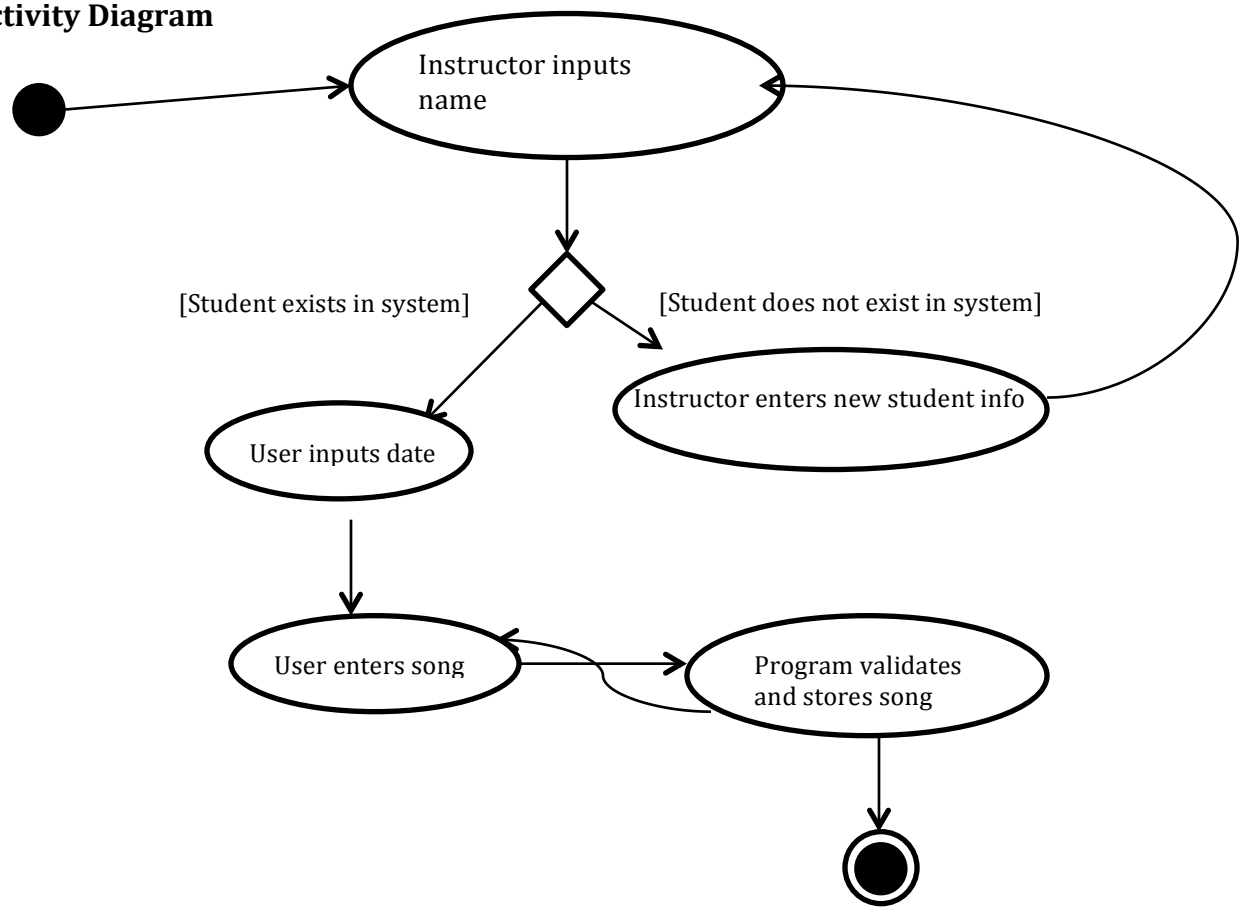
The following are the design documents for a play-list management system called PlayMaster. This document includes three use cases, two activity diagrams, two sequence diagrams and an object diagram for the system.

Use Case: Instructor provides a list of practice items for a student in a system

Main Path	**Alternate Paths**
1. Instructor inputs student name 2. Student exists in system (has been entered)	2.1 Student doesn't exist 2.1.1 Instructor re-executes the program to input student information 2.1.2 Instructor re-executes the program to input song list information
3. Instructor inputs song list and date for song list to be played (new date) 4. System adds songs to date list	3.1 Date already exists in storage 3.1.1 Systems opens date to append to list

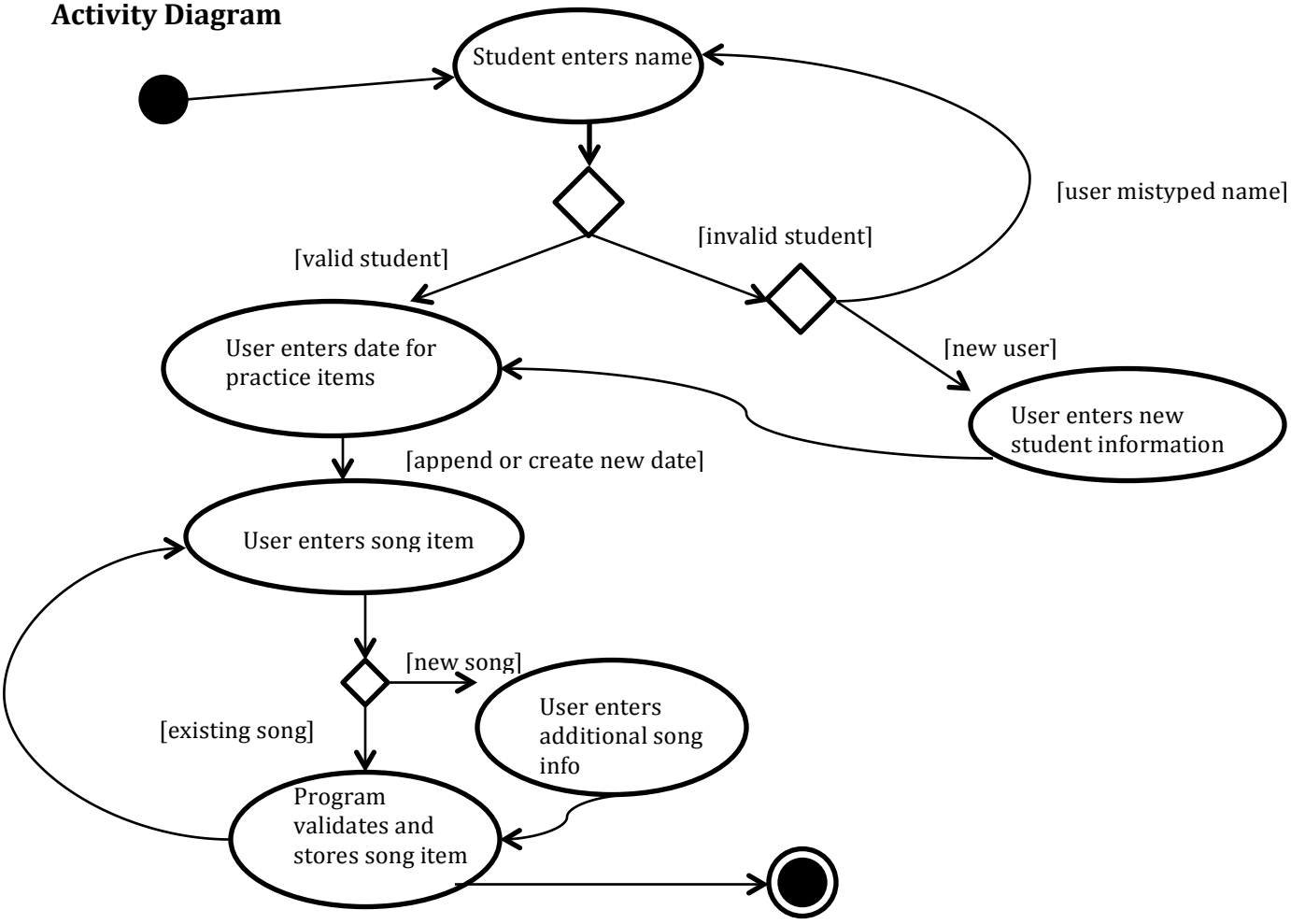
Activity Diagram



Use Case: Student provides list of practice items for a given day

Main Path	**Alternate Paths**
1. Student enters name	4.1 Student Name Does Not Exist 4.1.1 User enters student information (new student) –or- re-enters name correctly
2. Student enters new date for practice items	2.1 Date already exists in storage 2.1.1 System appends data to list of items for given date
3. Student enters list of practice items for given date	
4. System validates and stores information	4.1 Songs don't exist in storage (new song) 4.1.1 User enters additional song information and info is stored

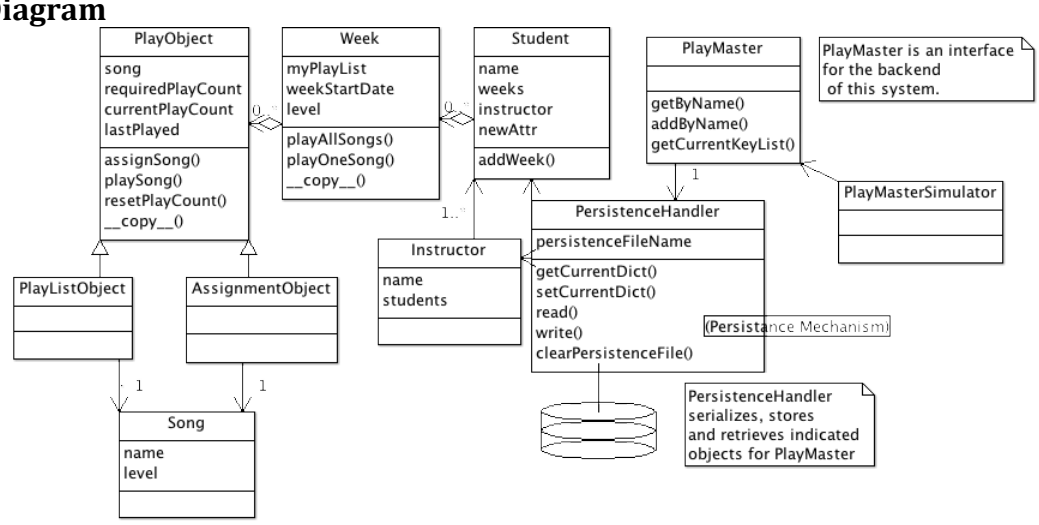
Activity Diagram



Use Case: Instructor requests monthly report for given student

Main Path	**Alternate Paths**
1. Instructor inputs name and requests report for given student and given month	1.1 Student does not exist in storage 1.1.1 System returns error
2. System locates and builds report for existent student for given month	2.1 Data doesn't exist for given month/student 2.1.1 System returns error

Class Diagram



Description of classes:

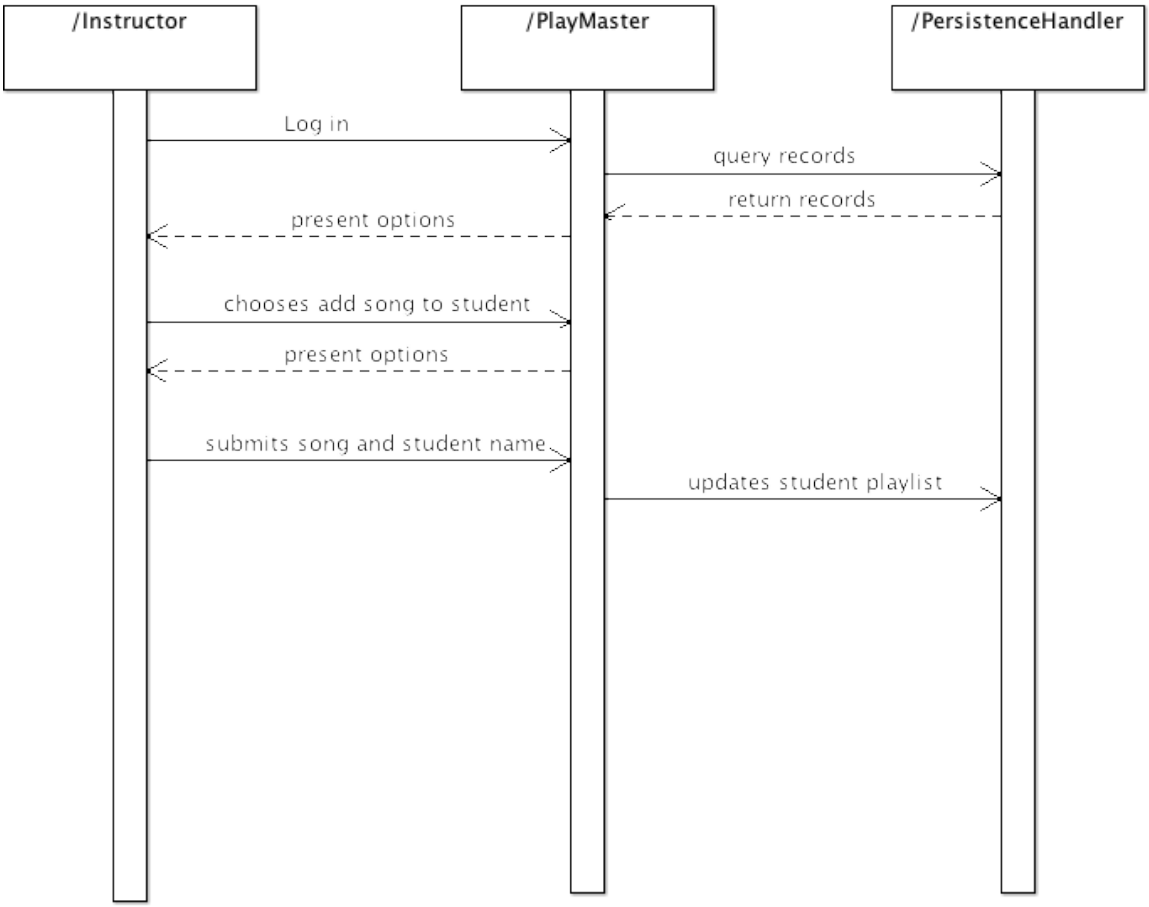
- **PlayMasterSimulator** - This object handles our textual user interface, interacting with the PlayMaster façade to handle all transactions between a user and the backend.
- **PlayMaster** – Provides a façade for the persistence and object backend of the system.
- **PersistenceHandler** – Interacts with DB backend – in this case, we store a JSON encoded dictionary of lists of serialized python objects (whew!), converts objects to serialized entities in DB and vice versa.
- **Instructor** – Handles instructor responsibilities, mapped with 1+ students to 1 instructor.
- **Student** – Handles student responsibilities, aggregates week list.
- **Week** – Aggregates playlist and added songs by instructor, keeps track of progress
- **PlayObject <- PlayListObject and AssignmentObject** –Handle aggregation of songs as appropriate for different expectations for number of plays. PlayObject is the parent object of both, which slightly differ in their implementation/requirements, but the polymorphism here is important…
- **Song –** Handle generic song responsibilities and store attributes such as name, creator, level, etc.

A note on persistence

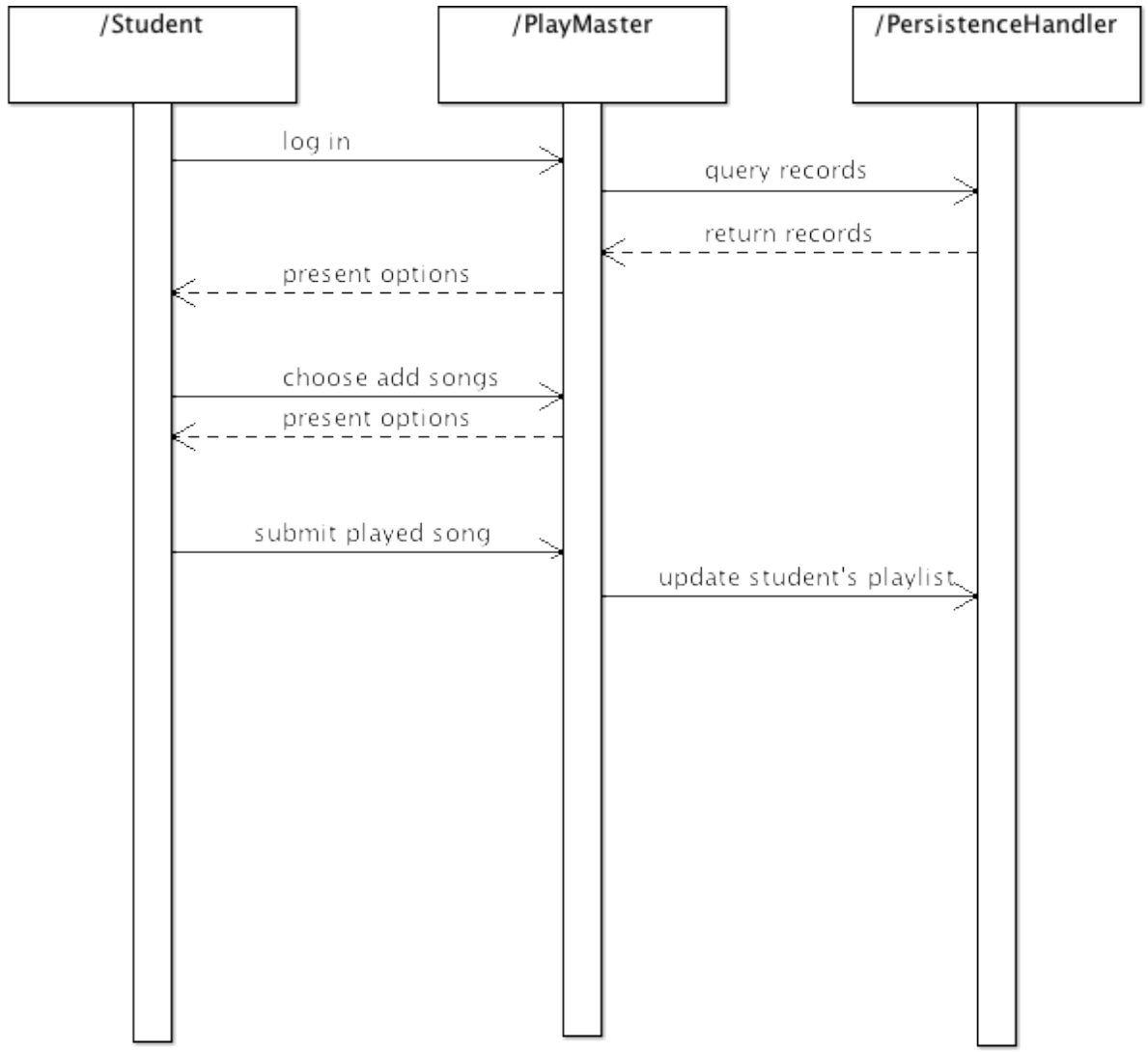
I elected to go with a simple persistence route and store serialized python objects encoded with the pickle module (which ships with python natively, I believe). This approach is not secure (persistence file can be edited/altered to do bad things), but nice and convenient for ease of OOP design. The PersistenceHandler class implicitly capitalized on python-native polymorphism (every class definition implicitly subclasses the 'object' superclass to be able to serialize/deserialize nicely…

Sequence Diagrams (for Use Cases 1 and 2)
For simplicity, these show interaction with the interface of PlayMaster…

#1



#2


/Student
/PlayMaster
/PersistenceHandler
log in
query records
return records
present options
choose add songs
present options
submit played song
update student's playlist