**DESIGN DECISIONS REPORT – NGOC DUY NGUYEN**

**MUSIC BAND TOUR SIMULATION**

1. Overview

Idea: I have been listening to a rock band from Japan for more than a year now and I really like their songs. With many things I have learned form this course I decided to create a world tour simulation for the music band “SPYAIR”.

How it can be implemented: I tried to make it simple so there are 3 main units (Manager, band members and audience) and 1 helper inner class (assistant):

* Manager: has to prepare everything such as location, date, the amount of tickets will be available and how many tours are the band is going to do
* Assistant: It could be overwhelm for a manager to do all the things so he need a assistant to do a few things for him. He will notify the band members where and when to perform
* Band members: will have a jobs that is let everyone know that they have heard the notification then they will go on stage and perform for the audience
* Audience: need a ticket to enter to the theatre and see the performance.

1. Design/ implementation decisions

**Pattern used: Singleton, Adapter, Semaphore, Observer, Iterator**

Singleton: I made use of singleton class StatisticsContainer to store integer and float value from the simulation. Average wait time is used at Audience class to submit average time to the FloatWorkerStatistic. Manager will submit the stats for number of countries visited, number of tours, ticket sold to WorkerStatistic

Adapter: I since the thread has to inherit from Unit class so Manager class could not extend Unit and Observer at the same time. So I decided to make an inner class adapter – Assistant (which extend Observer) so the Manager could schedule and pass the information (location and perform date) to the assistant.

Semaphore: since the simulation is multithreaded so I need 3 main thread Manager, Member and Audience to perform their task orderly. So at first members need to be ready by releasing permit to Manager so he can schedule next tour. Then audience has to wait for the manager to release ticket permit so they can enter the theatre. Band members need to acquire permit from audience because they have to wait for all audience to get in, after that they can go on stage and perform.

Observer: to notify location and perform date to band members I decided to choose Observer. The idea is Manager will use method setLocation and setPerformDate which will call the setLocationAssist and setPerformDateAssist of inner class Assistant

Iterator: to go through an array list of visited country that the band has been to

**Choice of logic**

To simulate a simple tour band I need some variable for the statistics which include int-number of tour, int-countries visited, int-ticket sold and float for average wait time of audiences. An array list is used to store visited countries and use iterator to print out each element in the list

1. VisualizationDiagram

   Description automatically generated