

# Schedule Management Framework

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This document contains the problem, solution design, application build and run steps of schedule management process.

Readme file

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## Problem:

### Problem Two: Conference Track Management

You are planning a big programming conference and have received many proposals which have passed the initial screen process but you're having trouble fitting them into the time constraints of the day there are so many possibilities! So you write a program to do it for you.

- The conference has multiple tracks each of which has a morning and afternoon session.
- Each session contains multiple talks.
- Morning sessions begin at 9am and must finish by 12 noon, for lunch.
- Afternoon sessions begin at 1pm and must finish in time for the networking event.
- The networking event can start no earlier than 4:00 and no later than 5:00.
- No talk title has numbers in it.
- All talk lengths are either in minutes (not hours) or lightning (5 minutes).
- Presenters will be very punctual; there needs to be no gap between sessions.

## Solution Design:

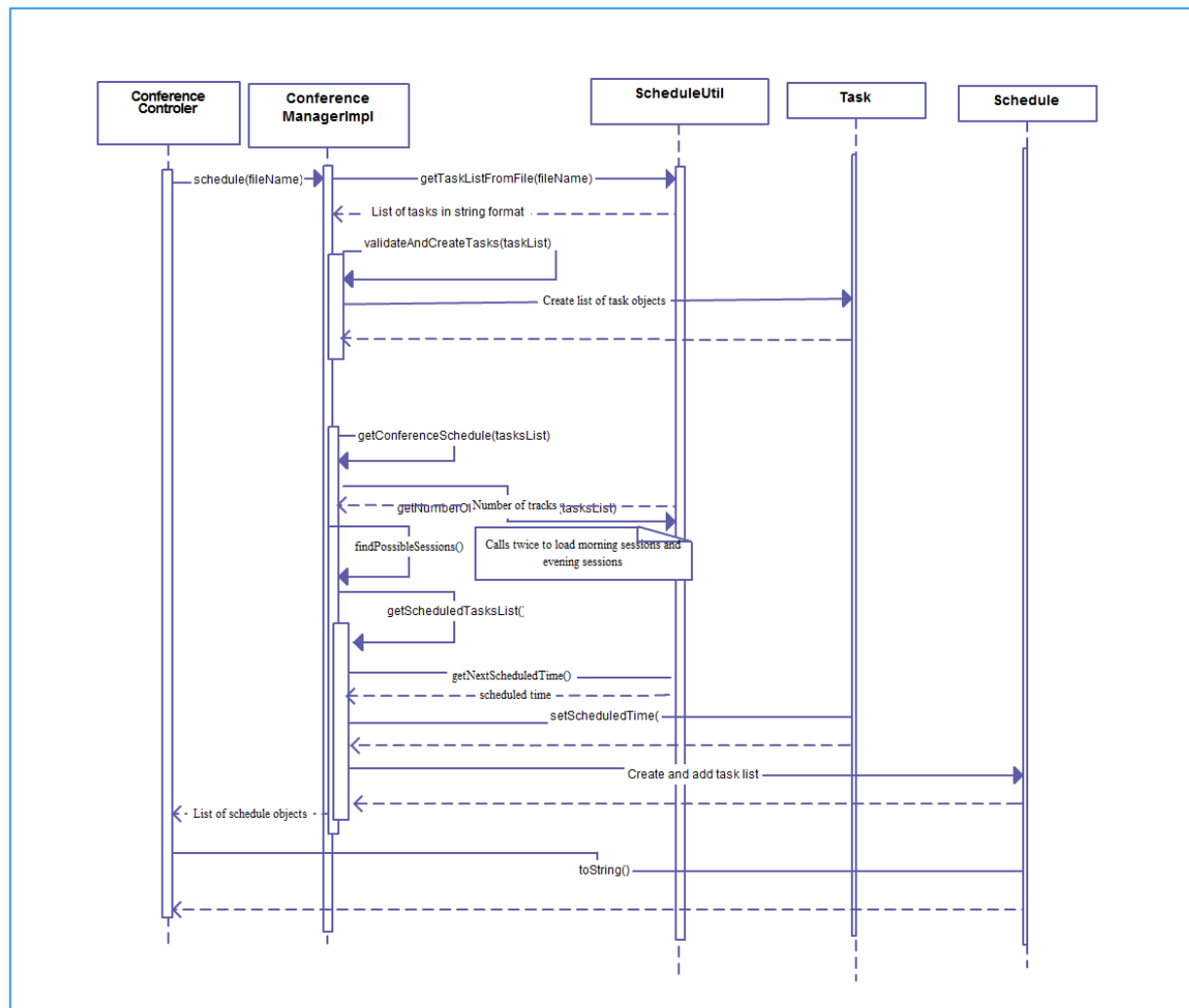
### Algorithm:

1. Read the input file and create list of tasks in String format.
2. Validate each task in String format and create Task objects using task title and time duration.
3. Calculate the number of possible tracks using the total time duration.
4. Find the possible combinations of tasks for morning session (session duration is exactly 180 mins) and for evening session (session duration is greater than or equal to 180 mins and less than or equal to 240 mins). Mark each tasks assigned to each session as scheduled.
5. If there are tasks remaining un-scheduled; schedule those in evening session till time permits.
6. If all tasks scheduled create schedule list for each track using possible morning and evening combinations.

### Assumptions:

1. Morning session cannot be less or more than 180 minutes.
2. Given task cannot split into two sessions or more.
3. Maximum time duration for a given task is 240 minutes (equal to maximum session duration) and if there are tasks more than 240 minutes then the task list is invalid.

## Sequence Diagram of Conference Management process:



### File description:

File Name	Description
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\conference\controller\ConferenceController.java	Controller class of Conference Management; calls schedule manager to create the list of schedules and print them out.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\conference\model\ConferenceManagerImpl.java	Model class of Conference Management; implements ScheduleManager interface and provides logics specific for scheduling conferences.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\exception\InvalidTaskException.java	Exception class in schedule management framework; wraps exceptions and validation failures during scheduling process.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\model\ScheduleConstant.java	Constant interface in schedule management framework; holds constant values used in frame work.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\model\ScheduleManager.java	Schedule management interface; provides definitions of common methods in schedule management framework.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\model\dto\Schedule.java	Schedule data transfers object; holds list of tasks and track id.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\model\dto\Schedule.java	Task data transfers object; holds attributes related to task.
ScheduleManagement\src\main\java\com\mycompany\schedulemanagement\model\util\ScheduleUtil.java	Utility class in schedule management framework; provides common utility methods implementations.
ScheduleManagement\src\main\resources\schedule-properties.properties	Holds configurable messages and properties.
\ScheduleManagement\src\main\resources\TaskDetails.txt	Test input file.
ScheduleManagement\src\test\java\com\mycompany\schedulemanagement\conference\model\ConferenceManagerImplTest.java	Unit test class of ConferenceManagerImpl.java
ScheduleManagement\src\test\java\com\mycompany\schedulemanagement\model\util\ScheduleUtilTest.java	Unit test class of ScheduleUtil.java

## Pre-requisites:

1. jdk1.8.0\_25
2. apache-maven-3.2.3
3. JUnit 4.8.2

## Build Application:

Open command prompt and move to the location of pom.xml

(<Your directory path>/ScheduleManagement/pom.xml)

Execute command “mvn package”. This will build the application and run the unit tests.

schedule-management-1.0.jar will be created inside following directory.

<Your directory path>/ScheduleManagement/target

```
C:\Test\ScheduleManagement>mvn package
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building ScheduleManagement 1.0
[INFO] -----
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ schedule-m
[INFO] anagement ---
[WARNING] Using platform encoding (Cp1252 actually) to copy filtered resources,
i.e. build is platform dependent!
[INFO] Copying 2 resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ schedule-manage
[INFO] ment ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ sc
[INFO] hedule-management ---
[WARNING] Using platform encoding (Cp1252 actually) to copy filtered resources,
i.e. build is platform dependent!
[INFO] Copying 0 resource
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ schedul
[INFO] e-management ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ schedule-managemen
[INFO] t ---
[INFO] Surefire report directory: C:\Test\ScheduleManagement\target\surefire-rep
[INFO] orts

T E S T S
-----
Running com.mycompany.schedulemanagement.conference.model.ConferenceManagerImpl
est
Tests run: 8, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.159 sec
Running com.mycompany.schedulemanagement.model.util.ScheduleUtilTest
Tests run: 6, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.001 sec
Results :
Tests run: 14, Failures: 0, Errors: 0, Skipped: 0

[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ schedule-management ---
[INFO]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO]
[INFO] Total time: 4.141 s
[INFO] Finished at: 2014-12-22T13:20:23+11:00
[INFO] Final Memory: 11M/114M
[INFO] -----
```

## Run Application:

Execute “java -cp target/schedule-management-1.0.jar  
com.mycompany.schedulemanagement.conference.controller.ConferenceController”.

Give the path of file that contains task list and press enter.

```
C:\Test\ScheduleManagement>java -cp target/schedule-management-1.0.jar com.mycom
pany.schedulemanagement.conference.controller.ConferenceController
Enter file path:
D:\Software\Projects\ScheduleManagement\src\main\resources\TaskDetails.txt
Track: 1
09:00 AM Writing Fast Tests Against Enterprise Rails 60min
10:00 AM Overdoing it in Python 45min
10:45 AM Lua for the Masses 30min
11:15 AM Ruby Errors from Mismatched Gem Versions 45min
12:00 PM Lunch 60min
01:00 PM Common Ruby Errors 45min
01:45 PM Rails for Python Developers 5min
01:50 PM Communicating Over Distance 60min
02:50 PM Rails Magic 60min
03:50 PM Ruby on Rails: Why We Should Move On 60min
04:50 PM Networking Event

Track: 2
09:00 AM Accounting-Driven Development 45min
09:45 AM Woah 30min
10:15 AM Sit Down and Write 30min
10:45 AM Pair Programming vs Noise 45min
11:30 AM Programming in the Boondocks of Seattle 30min
12:00 PM Lunch 60min
01:00 PM Clojure Ate Scala (on my project) 45min
01:45 PM Ruby vs. Clojure for Back-End Development 30min
02:15 PM Ruby on Rails Legacy App Maintenance 60min
03:15 PM A World Without HackerNews 30min
03:45 PM User Interface CSS in Rails Apps 30min
04:15 PM Networking Event
```