# MisterMusik - Developer Guide

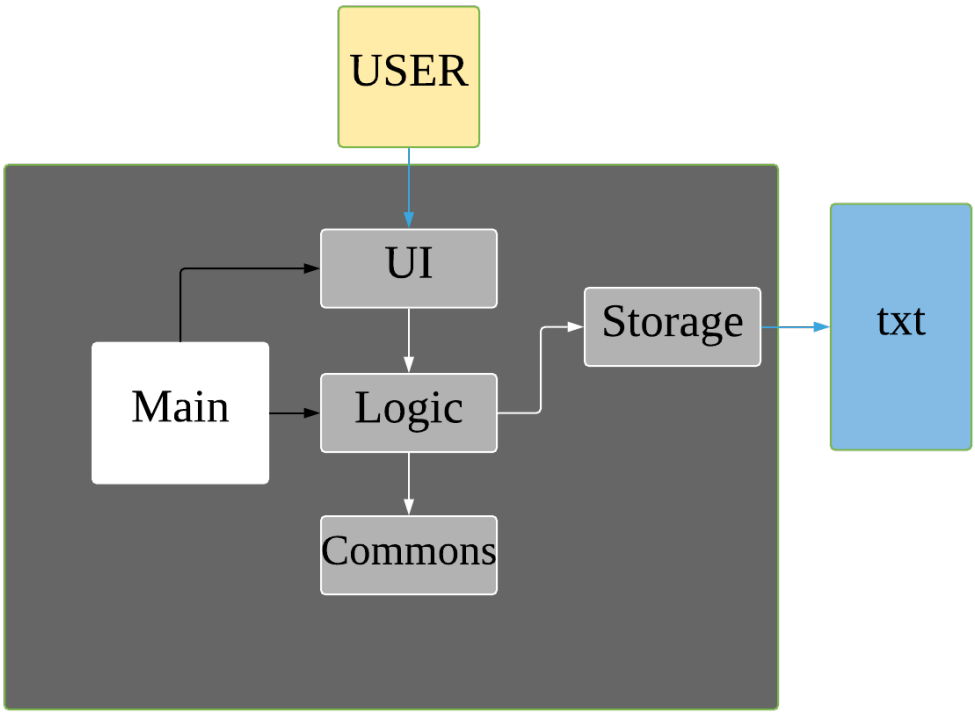
By: `Team CS2113T-F11-4` Since: `Aug 2019` Licence: `MIT`

# 1. Setting up

# 2. Design

## 2.1. Overall Architecture

This image shows the overall architecture of our program




There are three main components in the overall architecture of the application.

## 2.2. Main component

Main component has one class called `Duke`. It is responsible for the following:

1. On startup: Initializes all components and sets up the correct file path so that the program correctly interacts with the external txt file.
2. During runtime: Acts as an intermediary between the `Parser` class and the `Command` so that user input can be parsed and then executed accordingly.
3. On shutdown: Interacts with the UI class to communicate the shutdown message to the user.

## 2.3. UI component

UI component contains all classes necessary to interact successfully with the user. The `Parser` parses input commands from the user whilst the `UI` class handles all necessary dissemination of information to the user through `System.out`.

## 2.4. Logic component

This component contains all necessary classes that :

1. Are in charge of handling how all necessary information is internally stored within the program's runtime.
2. Alter the internally stored information whenever necessary (i.e when changes are made by the user).
3. Extract information requested by the user from the stored information and pass them back to the user through the UI component
4. This is achieved through the two classes `EventList` and `Command`. `EventList` decides how information is stored internally as well as how internal stored information is altered and/or extracted. `Command` commands the `EventList` class on what needs to be done at any point in time.

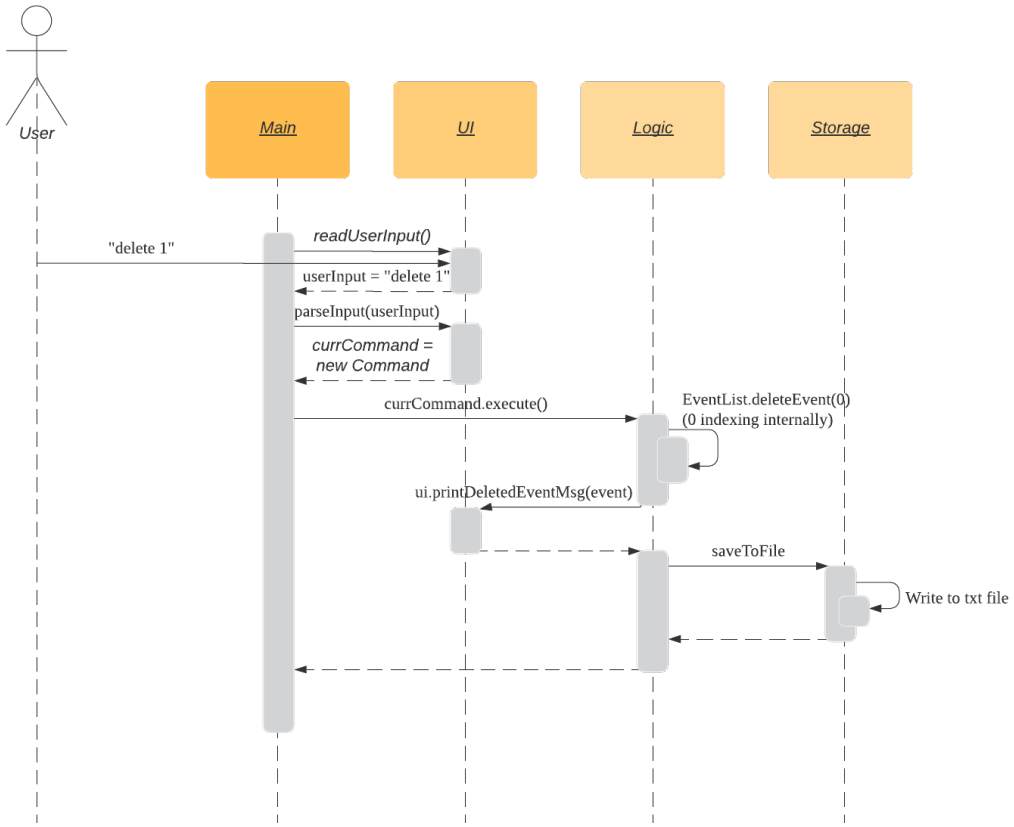
## 2.5. Storage component

This component contains all necessary classes that read and write external txt files. This is where all information is stored while the program is not running.
In particular, the `Storage` class directly reads from and writes to and external txt file in the data directory.

## 2.6. Commons

This component represent all other low-level classes required for the program to function.
This includes classes like the `Event` class which is the abstract parent class for all the types of classes that represent the different types of events(`ToDo`, `Concert`, `Exam`, etc.) a user can input as an entry in the program.

This image shows the sequence diagram when a user input "delete 1" is entered.




# 3. Implementation

This section describes some noteworthy details on how certain features are implemented.

## 3.1. Calendar Table

The calendar table is generated from the `EventList`. It prints on the screen a table of calendar of 7 days starting from a specified day, including the events within this time period.

### 3.1.1. How it is implemented

Given below is how a calendar table is generated and printed.

Step 1. User enters `calendar` to start the initialization process of a calendar table with today as the starting day.

Step 2. The program checks the date of the given start day to generate a list of 7 days, starting from given day. It also gets the day of the 7 days (e.g. Monday, Tuesday, etc). This sets the dates info of the table.

E.g. Example of a day and dates list

Step 3. The program find all events in the `EventList` that is within the 7 days, and store them correspondingly into 7 queues, representing the 7 days. This is for further printing.

E.g. Example of an event list of 7 days

Step 4. The program now have all the information of these 7 days and is then able to print the calendar table.

1. It initiates an empty string to store all info of the calendar and for later printing.
2. It puts the header of he table into the string.
3. It puts the days of week and dates info into the string.
4. To add in events, each event takes 3 rows (time info, description, and dashes) to print. For each 3 rows, there can be at most 7 events. The events are added per 3 rows. For each 3 rows, the program creates an array of 3 * 7 to store the details. Whenever there exists an event at the position of a day, details of the event will be added to the corresponding 3 rows (1 column) of the array. The array is then added by rows into the string.

E.g. Example of a row of events stored for printing

### 3.1.2. Commands for CalendarView

- `calendar` This prints the calendar table of this 7 days.
- `calendar next` This prints the calendar table of the next 7 days.
- `calendar last` This prints the calendar table of the last 7 days.
- `calendar on` Allow the calendar to be printed after every command execution.
- `calendar off` Not allowing the calendar to be printed after every command execution.

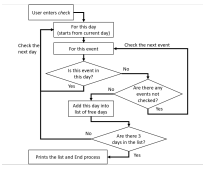
## 3.2. Check Free Days

CheckFreeDays is a command that allows the program to search for the next 3 days without any events (except ToDos).

1. When the user enters `check`, starting from the current day, the program checks all the events whether any is in this day.

2. If not, this day will be added into a list.
3. Above process will continue until the list has 3 days, which will then be printed.

The following logic diagram shows how check free days is implemented.



# 3.3. Checklists

Checklist of each event can be used to remind users of certain items (e.g. bring glasses to concert). This is implemented by storing an array list of strings in `Event` objects.

Checklist implementation contains 4 operations:

### 3.3.1. add checklist item

`checklist add <event index>/<checklist item>` This adds an item into a specific event's checklist.

### 3.3.2. view checklist

`checklist view <event index>` This prints on the screen the checklist of an event.

### 3.3.3. edit checklist item

`checklist edit <event index> <item index>/<new item>` This edits a specific item in the checklist of an event.

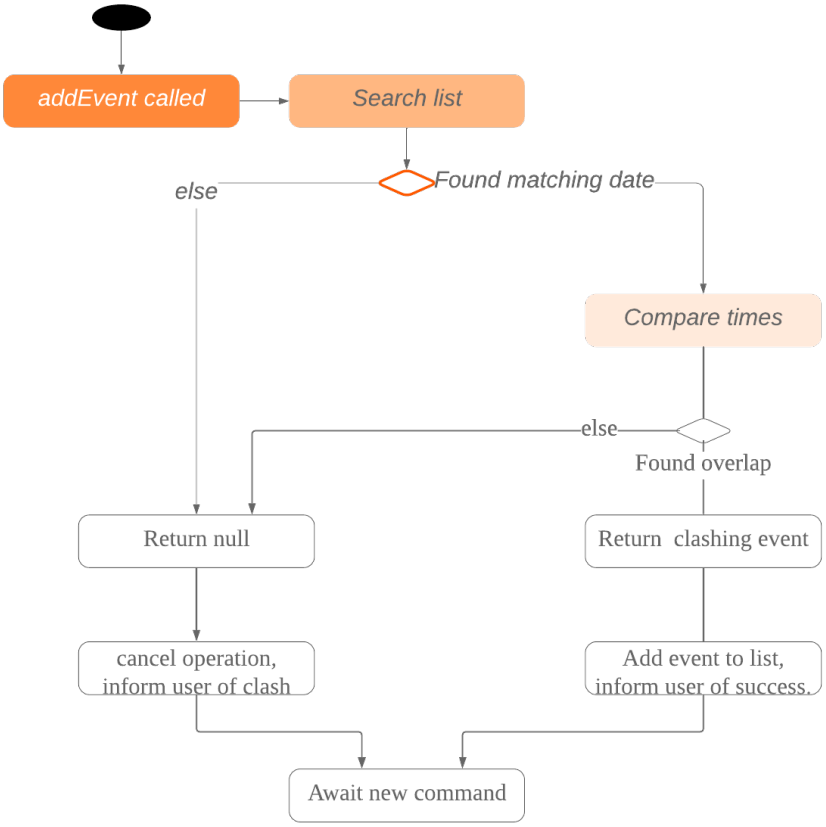
### 3.3.4. delete checklist item

`checklist delete <event index> <item index>` This deletes an item from the checklist of an event.

# 3.4. Clash handling

### 3.4.1. Activity diagram

The following activity diagram represents a typical clash handling scenario




### 3.4.2. How is it implemented

The program is able to **detect clashes when creating new events**. When the user enters the command to add a new Event entry to the list, the method `EventList.addEvent` is called from the `Command` class object upon execution.

The `addEvent` method will then call the `EventList.clashEvent` method to check the existing entries for any clash in schedule. This is done by first searching the list for an event that has a matching date with the new event.

If no such event is found, the method returns a ***null*** value, indicating that there is no schedule clash. If an event is found with a matching date, the `clashEvent` then calls the `EventList.timeClash` method to check whether the two events have overlapping time periods.

If there is any overlap, the `timeClash` method will return ***true*** as a boolean, indicating there is a schedule clash. The `clashEvent` method then throws an exception `ClashException`, indicating that there was indeed a schedule clash between the desired new entry and some pre-existing Event.

The details of the clashing Event are passed back to `Command` object so that it can be used to inform the user about the clashing event. The user is then required to fix the conflict before continuing, either by rescheduling or deleting the pre-existing event, or by choosing a different date/time for the new Event entry.

### 3.4.3. Why it is implemented this way

The process of checking for a clash was implemented as small, simple components so as to ensure scalability, reliability, and to reduce dependencies.

The choice to use exception handling to deal with an event clash was done so that it could be easily re-purposed for any incremental extension that required checking for a schedule clash. Catching of the ClashException should be performed in the Command class, and the info regarding the schedule clash can be easily obtained for further action.

By having the `clashEvent` method return a ***null*** value or a reference to a clashing event in the schedule, the `clashEvent` method can now be used for any further increments to the code requiring addition of events.

It was thus easy to implement this clash detection as a part of adding recurrent events (to check for clashes when recurrent events were automatically entered) as well as the rescheduling function (to check for clashes when the user attempts to reschedule an existing event, so that he/she does not inadvertently create a new schedule conflict).

This implementation is reliable because it can always be expected to work whenever it is necessary to add new events to the list, provided the unit tests for this functionality under MainTest work. It is also not dependent on any other functionality, allowing for developers to change the implementation of other parts of the application without affecting the clash handling

### 3.4.4. Expected behaviour of functionality

When a user attempts to add an event(recurring or otherwise) and the program detects a clash with an existing event in the pre-existing list, the following output should be printed:
"That event clashes with another in the schedule! Please resolve the conflict and try again!"
This is followed by the following line indicating the details of the detected clash:
"Clashes with: [E][X] YST Final project review START: Tue, 03 Dec 2019, 15:00 END: Tue, 03 Dec 2019, 18:00

### 3.4.5. Design considerations

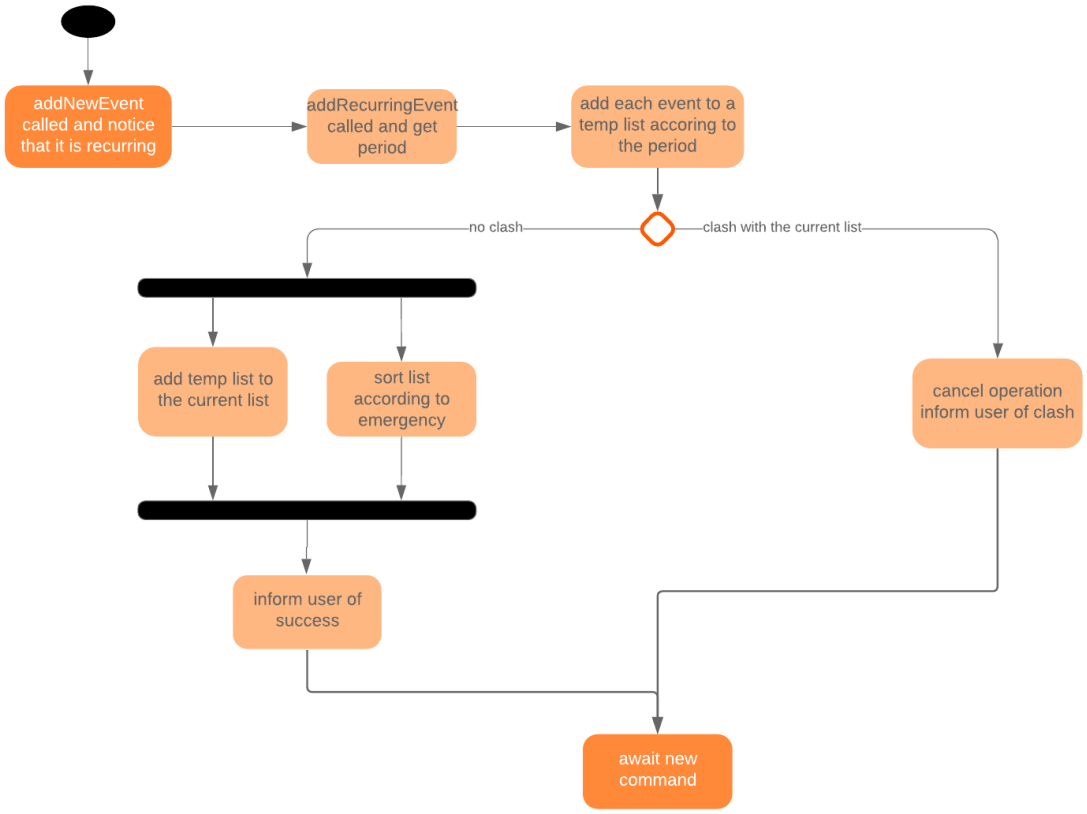
While designing the clash handling system, i had to decide how best to:
1. Detect a clash.
2. Pass relevant information back to the caller class for further usage.

| Aspect | Alternative 1 | Alternative 2 |
| --- | --- | --- |
| How clashes were detected | Simple if-else statements instead of using exception handling.<br><br>Pros: Much easier to implement and simpler to work with.<br><br>Cons: Less scalability as it would be harder to integrate the functionality into new features. | Have a specific command/method so that the current list can be checked for a clash at will.<br><br>Pros: Much more flexible, and even more scalable than the current implementation as it would be possible to do anything regarding changes to the list, and then later check for clashes.<br><br>Cons: Much more room for error, since clashes are allowed to exist within the list normally, and are not automatically detected. This could lead to major bugs related to events that overlap eac other. |
| How relevant information is passed up the chain | Simply returning the relevant event that caused the clash as a part of the method call.<br><br>Pros: Extremely simple to understand. Easy to implement. No need to deal with exception handling, just code for specific case in the event of a clash.<br><br>Cons: Less scalable. If a developer wants to add more functionality to the clash handling(e.g return more data), he/she would need to return a new object containing the relevant data. | |

# 3.5. Add recurring events

## 3.5.1. Activity diagram

The following is the activity diagram for adding recurring events.




### 3.5.2. How it is implemented

The program is able to detect recurring events and their periods when creating new events. When the user enters the command to add a new `Lesson` or `Practice` event with a period (in days) followed, `createNewEvent` method will call `entryForEvent` to get the period.
If the new event is not a recurring event, the period value will be assigned to `NON-PERIOD` and then call the `addEvent` method in the `EventList` class.

After getting the period, the `createNewEvent` method will call the `addRecurringEvent` method in the `EventList` class to create and store new events in the eventList.
The calculation of dates are done by Java Calendar, `Calendar.add` function is called to calculate the startDate and endDate of new events in `Java Date type`. The number of recurring events is depended on the period, since the maximum date between the first recurring event and the last one is up to `ONE_SEMESTER_DAYS` which is assigned to 16 weeks (112 days) now.
When creating the `startEventDate` and `endEventDate` of the new event, `calendar.getTime` is called and the `identifier` in EventDate will be assigned to `DATE_TO_STRING`, so that the `startDateAndTime` and `endDateAndTime` are in `String type`, which fits the requirement of the `Event` class.

All the events created in the `addRecurringEvent` method will be checked whether having clash with the events in the current eventList and then added in a temporary event list one by one. If no clash happens, the `tempEventList` will be added to the current `eventList`.

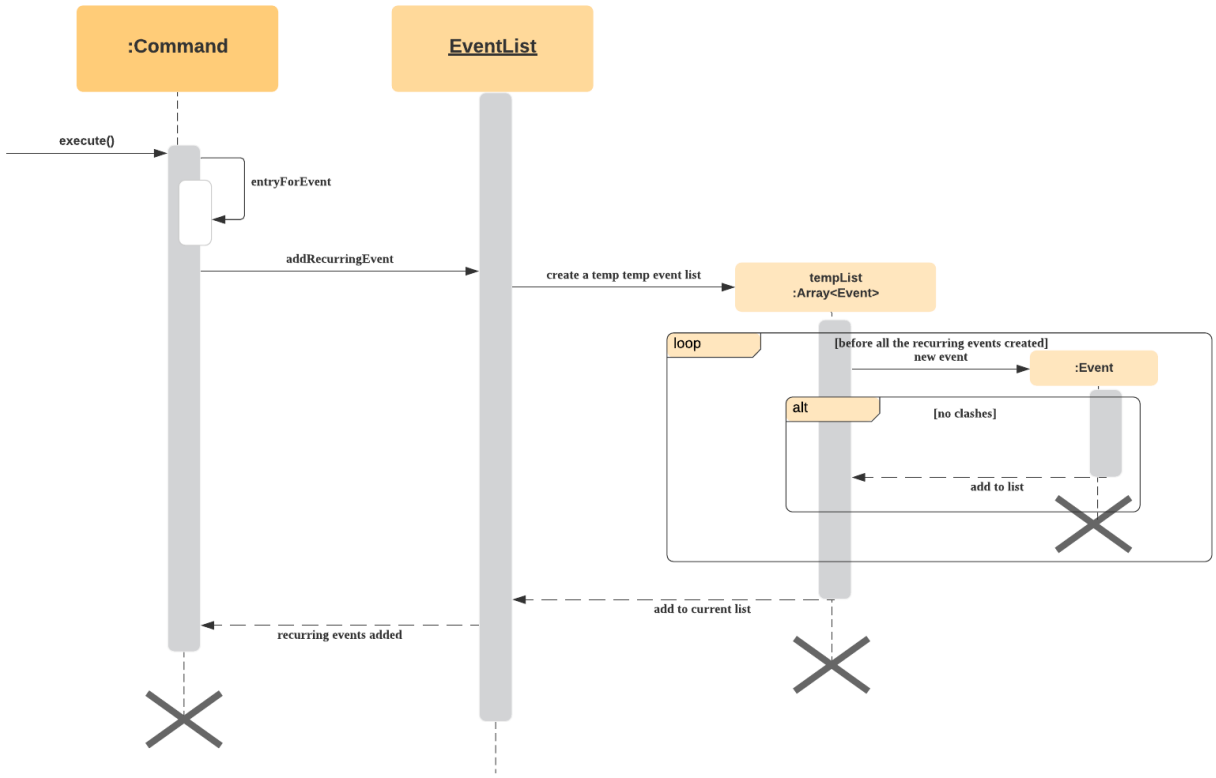
Given below is an example usage scenario compared to adding non-recurring event.
Recurring event: `lesson|practice` <event description> /dd-MM-yyyy HHmm HHmm `/<period(in days)>`
Non-recurring event: <event type> <event description> /dd-MM-yyyy HHmm HHmm

### 3.5.3. Why it is implemented this way

1. Whether the input command has a period is considered at the first, so that the dependency between adding recurrent events and adding normal events could be reduced.
2. The `add(int field, int amount)` method of `Calendar` class is used to add or subtract from the given calendar field and a specific amount of time, based on the calendar's rules.
   `public abstract void add(int field, int amount)`
3. Since the number of recurrent events with a short period could be large, it is more likely to have clashes with the current eventList. Hence, before added in the temporary event list, the new event need to be ensured that no clash happens.
4. To keep the format of creating new events, the format process of changing Java Date to String is done in the `EventDate` class instead of messing the `Event` class to accept both Date and String types as input date and time.

### 3.5.4. Sequence diagram

The following sequence diagram shows how the adding recurring event operation works.




### 3.5.5. Design considerations

Aspect: How to avoid adding infinite events

- **Alternative 1 (current choice):** Set a upper limit to ensure the interval between the first and last events added to list is not too long.

- Pros: Easy to implement. Easy to add lesson and practice in one semester.
- Cons: Not agility. May add too many extra events if users want short interval between the first and last recurring events.
- **Alternative 2:** Let users to set the interval between the first and last recurring events.
- Pros: Will be more agility and user friendly.
- Cons: Hard to unify the command format.

# 3.6. Contacts list

## 3.6.1. How is it implemented

The contacts list stores a list of contacts contain <name>, <email address>, and <phone number> information added by users. The list is stored in each individual event. When the user first creates the event, the event is created with an empty contact list.
**Users can add, edit, delete a specified contact item, and view the contacts list of a specified event.** - Given below is an example to adding a contact:
`contact add <event number> /<name>, <email address>, <phone number>` - To view contact list of an event:
`contact view <event number>` - To edit a contact in the contact list:
`contact edit <event number> <contact number> <name|email|phone> /<new contact>` - To delete a contact in the contact list:
`contact delete <event number> <contact number>`

## 3.6.2. Why is it implemented this way

1. For different events, users may have different people to contact with. So a empty contact list is created under each event. For some events, users may have more than one person to contact with. Hence, users are allowed add more contact items under one event.
2. We want to keep the information highly relative to contact, so users just need to add <name>, <email address>, and <phone number> for a contact item. Sometimes may not have the email or phone number of a person, so it also allows users to add one of <email address> and <phone number>.
3. The main propose of MisterMusik is schedule events, so the contact list is hidden on the basic list viewing. Users can use command `contact view <event number>` to see the contact list of the specified event.

# 3.7. Viewing specific dates

## 3.7.1. How is it implemented

The implementation is a simple for loop that runs through the existing task list. If a matching date is detected, it will return the corresponding task and add it to a temporary list of found tasks. After running through the whole list, the temporary list will be printed out to display all the tasks of a specific date.

Step 1: When the command "view <date>" is given, the viewEvents() method will be called.

Step 2: A temporary ArrayList is created by the method to be populated.

Step 3: The date string from the input command is passed into the EventDate class to be formatted into the same format as that of each event and returned as a string.

Step 4: The returned string is compared with each task in the event list to check for any event with a matching date.

Step 5: When an event with a matching date is found, the event is added to the temporary list.

Step 6: After the entire list has been checked, the temporary list is passed into a UI instance

Step 7: The printFoundEvents() method will be called. The said method then prints out the temporary list, displaying the list of events taking place on a specific date.

In the situation when an empty temporary list is passed into the UI for it to print, an exception will occur and the printFoundEvents() method will catch the exception before printing out a string to inform the user that there are no tasks taking place on that specific date.

### 3.7.2. Activity Diagram

[DGViewEventsDiagram] | *DGViewEventsDiagram.png*

### 3.7.3. Why is it implemented this way

The matching events are being stored individually into a separate temporary list before being printed out. This is to allow an easier handling of individual tasks as separate instances in case the user wishes to edit a particular task from the temporary list.

### 3.7.4. Alternative implementations considered

Storing all the matching events as a single string, passing the string into the printFoundEvents() method to print out. This implementation is undesirable as it will be difficult to access individual matching events in the case the user wishes to edit them as mentioned above.

## 3.8. Goals List

### 3.8.1. How is it implemented

The goals list is an array list type that stores a list of goals to be achieved by the user for each individual event, particularly for Lesson and Practice type events. When the user first creates the event, the event is created with an empty goal list. Only when the user types in "goal add <event ID>" then the goal list will be updated with the particular goal. The user can then manipulate the goal list by using "goal edit", "goal delete" or "goal view" commands.

**Adding a goal**

Step 1: When the command "goal add <event ID>/<goal description>" is entered, the goalsManagement() method will be called.

Step 2: The command description will be split up into separate strings. The string for event ID will be parsed into an integer type.

Step 3: The method will check the string for the goal command description. In this case it will be "add" and execute the code for this case.

Step 4: A new Goal class instance will be created with the goal description string. Its achieved status set as false.

Step 5: The event corresponding to the ID entered along with its method addGoal() will be called to add the goal instance into the goal list.

Step 6: The goalAdded() method of the UI class will be called to reflect the change to the user.

### 3.8.2. Editing a goal

Step 1: The user will enter the command "goal edit <event ID> <goal ID>/<new goal description>". The goalsManagement() method is called.

Step 2: The command description will be split up into separate strings. The strings for event ID and goal ID will be parsed into an integer type.

Step 3: The method will check the string for the goal command description. In this case it will be "edit" and execute the code for this case.

Step 4: A new Goal class instance will be created for the new goal description.

Step 5: The method editGoalList() of the event corresponding to the input ID will be called. The method will set the goal indicated as the new Goal instance.

Step 6: The goalUpdated() method of the UI class will be called to reflect the change to the user.

### 3.8.3. Deleting a goal

Step 1: When the user enters the command "goal delete <event ID> <goal ID>", the goalsManagement() method will be called.

Step 2: The command description will be split up into separate strings. The strings for event ID and goal ID will be parsed into an integer type.

Step 3: The method will check the string for the goal command description. In this case it will be "delete" and execute the code for this case.

Step 4: The corresponding event will have its removeGoal() method called which removes the indicated goal from the list.

Step 5: The goalDeleted() method of the UI class will be called to reflect the change to the user.

### 3.8.4. Setting the goal as achieved

Step 1: When the command "goal achieved <event ID> <goal ID>" is given, the goalsManagement() method will be called.

Step 2: The command description will be split up into separate strings. The strings for event ID and goal ID will be parsed into an integer type.

Step 3: The method will check the string for the goal command description. In this case it will be "achieved" and execute the code for this case.

Step 4: The method updateGoalAchieved() for the corresponding event will be called.

Step 5: The goals list within the event is called with the indicated goal.

Step 6: The indicated goal will then call its setAchieved() method that assigns the boolean isAchieved attribute of that particular goal to "true".

Step 7: The goalSetAsAchieved() method of the UI class will be called to reflect the change to the user.

### 3.8.5. Viewing the goal list

Step 1: The user will enter the command "goal view <event ID>". The goalsManagement() method will be called.

Step 2: Command description will be split and the string for event ID will be parsed into an integer type.

Step 3: The printEventGoals() method will be called to check the contents of the goal list for the indicated event.

Step 4: If the goals list is not empty, it will print out the contents of the list using a for loop. Otherwise it will print a message to the user to reflect that the goal list is empty.

### 3.8.6. Why is it implemented this way

The goal managing function is implemented as a separate list within an event in order to utilise the indexing of the list elements. This way, a particular goal for a particular event can be easily accessed and manipulated via the input of an integer.

### 3.8.7. Alternatives considered

An alternate method considered was to implement the goals list as a separate class of its own. Each goal within this list will then be mapped to their corresponding events. This implementation method would cause difficulties on the users' part in identifying the ID of a particular goal and would generally makes the goal list less organised.

## 3.9. Past event management

This functionality basically tracks which tasks in the list have already passed, and subsequently only displaying future tasks when the user uses the "list" command to view the list. This function is linked with the goals management function as it also detects unachieved goals in events that are already over.

### 3.9.1. How is it implemented

## 3.10. Reminders

### 3.10.1. How it is implemented

The reminder function filters out the tasks that are due or are happening before 2359 three days after the current date, and prints them out as a reminder for the users.

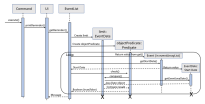
After the user enters 'reminder', the Command.execute method calls Command.remindEvents, which in turn calls the Ui.printReminders function. The Ui.printReminders function calls the EventList.getReminder method, which uses the EventList.filteredList method to filter out a list of events that are due or are happening before 2359 three days after the current date. The EventList.filteredList method filters out events from the stored list of events according to a certain input predicate.

The constructor of the Predicate class takes in two arguments: the reference and the comparator. The reference is the item that is used for the comparison reference (comp) input, and the comparator is the operator that is used for the comparison. The comparator should be either one of the three global integer variables: EQUAL, GREATER_THAN or SMALLER_THAN. The Predicate.check method takes in an input and checks if reference (comp) input is true by calling the appropriate method in the Predicate class depending on the type of the reference and input.

In the EventList.getReminder method, the reference of the input Predicate object is set to an eventDate object set to 2359 three days after the current date, and the comparator is GREATER_THAN. After that, the EventList.getReminder method calls the EventList.filteredList method. In the EventList.filteredList method, the system iterates through the list of Events in `eventArrayList`.The EventDate object stored in the the Event object is passed into the Predicate.check method. If the EventDate object stored in the the Event object is a date before the reference date, the Predicate.check method returns true and the Event object is added to the output. After all the elements in EventList.filteredList are parsed and the EventList.filteredList method terminates, EventList.getReminder method returns a string containing the current date and time, the date and time at 2359 three days after the current date, and the filtered list of events. This string is printed to stdout in the Ui.printReminders function.

### 3.10.2. Sequence diagram

The following sequence diagram shows how the reminder functionality works.



### 3.10.3. Why it is implemented this way

The reminder function is split the various components into different methods for easier testing. In this case, Ui.printReminders prints the output to the user interface, EventList.getReminder is responsible for compiling the output whereas EventList.filteredList obtains the filtered list of events from `eventArrayList`.

This implementation also implements scalability as the Predicate class and the EventList.filteredList method can be reused for other functionalities.

# 4. Documentation

# 5. Testing

# 6. Dev Ops

# Appendix A: Product Scope

## A.1. Target User Profile

MisterMusik is a scheduler program created for serious music students pursuing a professional music career as a western classical music performer. The program is designed to automate and streamline most of the process in scheduling and organisation of materials, allowing the students to focus more on the important aspects of their education.

# Appendix B: User Stories

1. As a busy music student with multiple classes, I want to be able to track my practice sessions so that I won't miss any trainings.
2. As a music student with a heavy workload, I want to be able to track my upcoming recitals and their details so I can prioritize which pieces/what techniques to practice and focus on.
3. As a music student with a tendency to procrastinate in things I need to do, I want to be constantly reminded of my examination dates so i do not wait till the last minute to prepare for them.
4. As a student who wants to maximize my efficiency in practice sessions (performer), I want to be able to rate and comment on the efficiency of my practice sessions and be able to review them to make sure that I learn and improve faster.

5. As a student who wants to categorize what I learn in classes, I want to be able to take notes and organize them into different categories, so that I can easily review it anytime.
6. As a student who wishes to be aware of his upcoming events, I wish to be able to view my schedule within a selected number of weeks so that I can plan for it.

# Appendix C: Use cases

## C.1. Entering a practice schedule into the system

1. User enters a command to add a practice followed by a date, and the details of the intended practice.
2. System prompts user about whether or not he wishes to make this a recurring practice (e.g every Tuesday).
3. User responds to the prompt accordingly.
4. System adds practice session to a stored list and saves it to a file on the user's hard drive.

## C.2. Entering the details of a recital into the system

1. User choose to enter a recital.
2. System requires details of the recital.
3. User enters date, time, venue, the pieces to be performed, and a description if needed.
4. System adds recital to a stored list and saves it to a file on the user's hard drive.

Extension 3.1: System detects there is a clash with a concert/practice session at step 3. 3.1.1. System generates warnings and ask user to delete the corresponding entry and forgo that event. 3.1.2. User responds to the warning, deleting or rescheduling one of the events in a clash if necessary. 3.1.3. System updates the stored list and saves it to the file on the user's hard disk.

Extension 3.2: System detects a clash with another recital or an examination at step 3. 3.2.1. System generates warnings and ask user to reschedule and re-enter one of the events that clash. 3.2.2. User responds to the warning, rescheduling and re-entering one of the events in a clash. 3.2.3. System updates the stored list and saves it to the file on the user's hard disk. Use case ends

## C.3. Making notes

1. User chooses to enter a command to start a note-taking/viewing session
2. System shows the user a list of categories (directories) of notes that have been made previously and prompts the user to enter one or create a new file.
3. User makes a choice to enter a category directory or create a new one.
4. System shows the user a list of files containing notes, each file is named with the corresponding date, and a description of the file decided by the user. System also prompts the user if he wants to create a new file or enter an existing one.

5. User selects a file to enter or chooses to create a new file.
6. System opens the file for viewing and editing. The user can choose to make changes to the notes using commands: delete, add and move to delete, add or move notes around the file accordingly.

Extension 3.1: System detects there is no category file that user commands to edit on 3.1.1. System generates warnings and ask the user whether or not he wishes to add a new category and take notes in 3.1.2. User responds to the warning, and choose to add a new category 3.1.3. System adds and opens a new category file with the name given by user

## C.4. Viewing upcoming events

1. User enters command `list` followed by an integer N representing the number of weeks in advance he would like to view his schedule.
2. System responds by showing the user a list of events in the next N weeks.
3. User may enter a command to remove specific tasks from the list, to have a cleaner viewing experience.

Extension 3.1: System can remove types of events from list at user's command 3.1.1. User can enter commands `remove examinations` for example, to remove the examinations from the display. 3.1.2. System responds accordingly, removing the type of event from the list and altering the list of events displayed.

Extension: 3.2. System can allow the user to only view a specific type of event. 3.2.1. User can also enter commands `show examinations` for example, to only show examinations in the list of events. 3.2.2. System will respond accordingly, displaying only type of event that the user specified.

Extension: 3.3. System can allow the user to only view events on a specific date. 3.3.1. User can enter the command "view <dd-MM-yyyy>"" to view all events on that specific date. 3.3.2. System will display the events, and the user can edit the events accordingly.

## C.5. Entering the examination details

1. User enters command `examination`, together with a description of the examination, along with the date, time, venue and any other notes in a given format.
2. The system adds the examination to the list of events.

Extension 1.1: System detects a clash with the examination date entered and another event. 1.1.1. System will prompt the user to reschedule the event of lower priority. (examinations and recitals are of highest priority, followed by concerts and then practices). If the clash is with an event of the same priority, the user is prompted to choose which one to reschedule(simple y/n response). 1.1.2. User reschedules the specified event by entering a date and time. The user is also able to delete an event with the delete command to free up the schedule if he wishes to do so. 1.1.3. System once again checks for clashes and repeats the process of rescheduling if necessary.

## C.6. Rate and comment on the efficiency of practice sessions

1. User enters a command to rate a practice session
2. System brings up a list of practice sessions that the user has already completed
3. User selects a practice session
4. System displays the details of the selected practice session and prompts the user to select an efficiency rating along with any additional notes
5. User rates the efficiency of the practice session and takes down any notes or feedback from their instructor
6. System saves the entry onto the hard disk

## C.7. Edit descriptions of any existing event

1. User enters a command to edit the description of an event
2. System edits corresponding description and prompts user of success

Extension 1: System detects a clash of incorrect format entered by the user. 1.1. System will prompt the user that the entered format was incorrect.

Extensions 4.1: Selected practice session has already been rated. 4.1.1. If the selected practice session has already been rated, the system notifies the user and allows them to edit. 4.1.2. The user edits the rating and notes of the practice session accordingly 4.1.3. System saves the changes onto the hard disk

Extensions 5.1: User inputs an invalid rating. 5.1.1. System displays an error message to inform the user of the correct rating format until a valid input is detected.

## C.8. Viewing all events in the coming 7 days.

1. User enters a command to view all events in the next 7 days.
2. System shows all events in the next 7 days in a calendar table.

# Appendix D: Non-functional requirements

1. System should work on windows and linux.
2. System response within 1 second.
3. Usable by non tech-savvy individuals.
4. Clear user prompts
5. Visually pleasing display

# Appendix E: Instructions for Manual Testing

## E.1. Launch and Shutdown

1. Initial Launch
   a. Open Duke.java in src.
   b. Run the file
   Expected: The Welcome Message is printed in stdout and the system requests for an input.
2. Shutdown
   a. Key in `bye` as input.
   Expected: The Goodbye Message ('Bye. Hope to see you again soon!') is printed in stdout and the process exits.

## E.2. Obtain the list of items currently in stored in the system

1. Key in `list` as input
   Expected: A list of items is printed in stdout.

## E.3. Add an Event

1. Add Todo
   Key in `todo tdtask /01-01-2011 0100`
   Expected: Output should be
   Got it. I've added this task:
   [x][T] tdtask BY: Sat, 01 Jan 2011, 01:00
   Now you have <previous number of items + 1> items in the list.
2. Add Exam
   Key in `exam Music Rudiments /08-08-2018 0800 0900`
   Expected: Output should be
   Got it. I've added this task:
   [x][E] Music Rudiments START: Wed, 08 Aug 2018, 08:00 END: Wed, 08 Aug 2018, 09:00
   Now you have <previous number of items + 1> tasks in the list.
3. Add Practice session
   Key in `practice morningprac /07-08-2018 0800 0900`
   Expected: Output should be
   Got it. I've added this event:
   [x][P] morningprac START: Tue, 07 Aug 2018, 08:00 END: Tue, 07 Aug 2018, 09:00
   Now you have <previous number of items + 1> tasks in the list.
4. Add Concert
   Key in `concert Noon Concert /06-06-2016 1200 1400/15`
   Expected: Output should be
   Got it. I've added this task:

[x][C] Noon Concert START: Mon, 06 Jun 2016, 12:00 END: Mon, 06 Jun 2016, 14:00
Now you have <number of tasks> tasks in the list.
Note: The final value (in this case 15) represents the cost of the concert in dollars. The significance of this is explained under section E.13 budgeting.

5. Add Recital
   Key in `recital Evening Recital /07-07-2017 1900 2100`
   Expected: Output should be
   Got it. I've added this task:
   [x][R] Evening Recital START: Fri, 07 Jul 2017, 19:00 END: Fri, 07 Jul 2017, 21:00
   Now you have <previous number of items + 1> tasks in the list.
6. Add Lesson
   Key in `lesson Class /09-09-2019 0900 0100`
   Expected: Output should be
   Got it. I've added this task:
   [x][L] Class START: Mon, 09 Sep 2019, 09:00 END: Mon, 09 Sep 2019, 01:00
   Now you have <previous number of items + 1> tasks in the list.

## E.4. Set a Task as done

Key in `done 1`
Expected: Prints a message that the first task on the list has been marked as done. Note: Only works for To-Dos.

## E.5. Find tasks that contains a certain keyword or key phrase

Key in `find <key>`, where `<key>` is the keyword or key phrase
Expected: Prints a list of tasks that contains the `<key>`.

## E.6. Get reminder

Key in `reminder`
Expected: Prints a list of tasks to be completed in the next three days.

## E.7. View all tasks in a certain day

Key in view `<date>`, where `<date>` has the format dd/MM/yyyy.
Expected: Prints a list of tasks that occurs on the given `<date>`.

## E.8. Edit description of an event

Key in `<edit> <event index>/<new description>`.+ Expected: Prints the success of editing event of index `<event index>`.

## E.9. Reschedule an event

Key in `reschedule <event index> <new date> <new start time> <new end time>`, where `<new date> <new start time> <new end time>` has the format dd-MM-yyyy HH:mm HH:mm.
Expected: Prints the success of rescheduling event of index `<event index>`.
e.g `reschedule 3 2-12-2019 1500 1600` will change the third (by list index) event's date and time to 2nd Dec 2019, starts 1500 ends 1600.

## E.10. Check the next 3 free days

Key in `check`.
Expected: Prints the next 3 days without any events.

## E.11. View the calendar table of the next 7 days.

Key in `calendar`.+ Expected: Prints the calendar table containing all events of the next 7 days, where the first column of the table is the current day.

## E.12. Contact management

1. Add contact to an event in the list
   Key in `contact add <event index> /<name>, <email>, <phone number>`
   Expected: Prints the success of adding the contact.
2. Delete contact
   Key in `contact delete <event index> <contact index> /`
   Expected: Prints the success of deleting the contact.
3. View contact
   Key in `contact view <event index> /`
   Expected: Prints the contacts information in the event.
4. Edit contact
   Key in `contact edit <event index> <contact index> <edit type> /<new contact information>`
   Expected: Prints the success of editing the contact.

## E.13. Budgeting

1. Each concert added to the list has a cost denoted at the end of the user input. For example, the user input command "concert MyConcert/2-12-2019 1500 1600/30" will have a cost of $30.
2. Attempting to add two concerts to the same month that exceeds the stipulated budget (set at $50) will result in a message telling the user so, and that the operation has been cancelled.
3. The user command "budget MM-yyyy" will result in the program displaying the costs of all concerts in the month denoted by MM-yyyy.