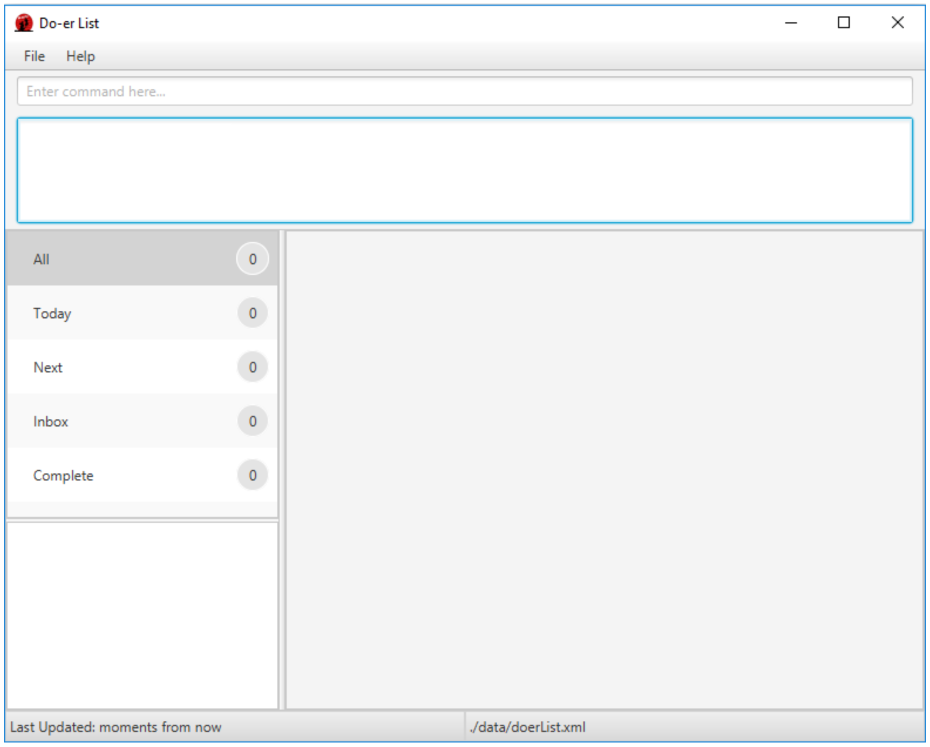
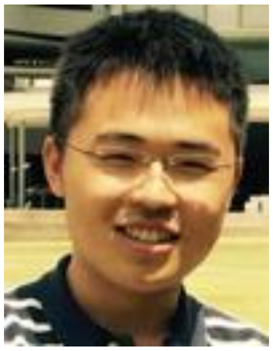
DO-*er* LIST



Supervisor: Si Junke Ashley

			
Ng Yong Sheng	Xiao Pu	Chan Jing Hui Benedict	Vu Hai Long

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Acknowledgements

- Certain aspects of this application were inspired by Marco Jakob’s Java FX tutorial.
- This program utilizes Natty Time, Pretty Time, Test FX, Guava and Jackson packages.
- This program is based off Address Book Level 4's sample code under the MIT license.

About Us

We are CS2103/T team (Wednesday 09 C4) based in the School of Computing, National University of Singapore.

Supervisors

Damith C. Rajapakse

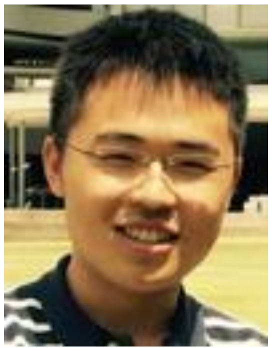
Role: Module Coordinator

Si Junke Ashley

Role: Project Advisor

Project Team

Xiao Pu



- Components in charge of: UI
- Aspects/tools in charge of: Testing, Integration, JavaFX
- Features implemented:
    - List Tasks
    - Find Tasks
    - View Tasks
    - Delete Tasks
- Code written: [functional code][test code][docs]
- Other major contributions
    - Design UI with Yong Sheng
    - Set up Gradle, Travis, Coveralls and Codacy
    - Help other writing UI parts and GUI test cases for the features they implement.
    - Update Developer Guide to match the project at the end

Yong Sheng

- Components in charge of: UI
- Aspects/tools in charge of: Guides, Balsamiq, Markdown
- Features implemented:
  - Add Recurring Tasks
  - Help Command
  - Exit Program
- Code written: [functional code][test code][docs]
- Other major contributions
  - Design UI with Xiao Pu
  - Help to design and improve the program interface and guides to be more user-friendly
  - Refactors and spot for errors in code comments

Benedict Chan

- Components in charge of: Storage
- Features implemented:
  - Mark Tasks
  - Unmark Tasks
- Code written: [functional code][test code][docs]
- Other major contributions
  - Collating the UserGuide.md and DeveloperGuide.md with Yong Sheng

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Vu Hai Long

- Components in charge of: Logic
- Aspects/tools in charge of: Testing
- Features implemented:
  - Add Tasks
  - Edit Tasks
  - Help Function
  - Task Due
- Code written: [functional code][test code][docs]
- Other major contributions
  - Do the original refractoring.

User Guide

About Us

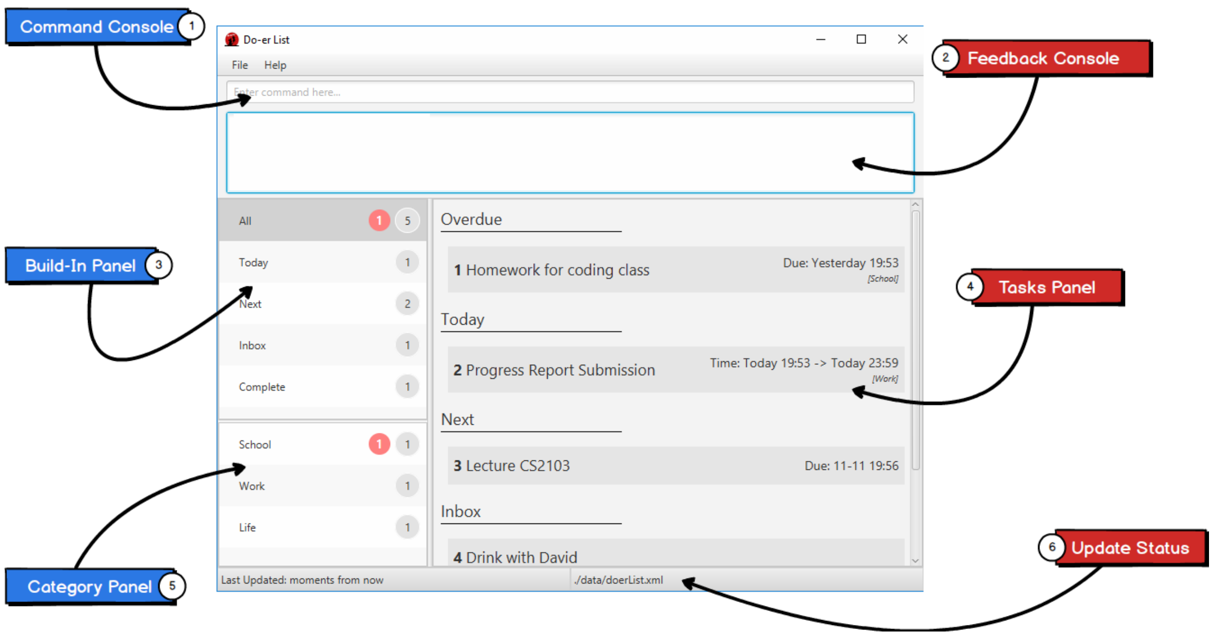
Living in the modern and fast-paced world nowadays, we are constantly overwhelmed with tasks to do. Many people face the problem of time management as the traditional methods prove to be little effective. That is what Do-er List aims to solve.

Do-er List is a task manager that is designed for students and office workers. It is a beginner-friendly desktop program that aids you in the planning and completion of your daily tasks. It does not matter if you are planning a big birthday surprise event or recurring task of handling the laundry every now and then, Do-er List is here to resolve your problems.

This user guide aims to allow any user to seamlessly use the product, as intended to. Just follow the instructions as stated and you will get the results you desire.

Eager and excited? Then let us proceed!

Overview



Labels	Description
1	Type your commands in the **Command Console** to execute the desired commands.
2	**Feedback Console** shows if your command is executed properly or not.
3	View your build-in categories in the **Build-In Panel**.
4	**Tasks Panel** will display all the tasks you listed in a panel.
5	**Category Panel** shows all the custom categories that you have created.
6	View your last update and file storage in **Update Status**.

Getting Started

Do-er List makes the process of adding, editing or deleting tasks a seamless process. Long gone are the days when you need to type in long and complicated commands or endlessly click on multiple buttons to get what you desire.

All commands have this standard format:

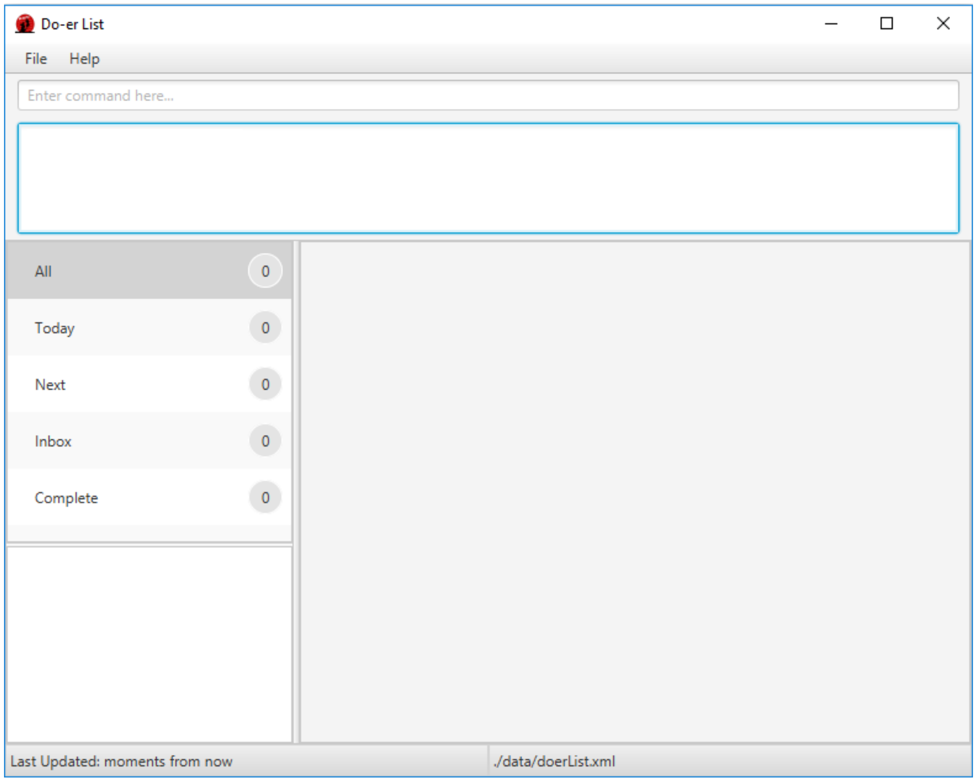
```
Command required_fields [optional_fields] ...
```

All commands start with a command words, followed by fields that are replaced by your inputs. The fields in the square bracket "[" and "] are optional. You can choose to not include these fields.

Please take note of the following:

1. Ensure you have Java version `1.8.0_60` or later installed in your Computer.
   > This app will not work with earlier versions of Java 8.
2. Download the latest `doerlist.jar` from the releases tab.
3. Copy the file to the folder you want to use as the home folder for the Do-*er*List.

4. Double-click the file to start the app. The GUI should appear in a few seconds.



5. Type the command in the command box and press `Enter` to execute it.
   - e.g. typing **`help`** and pressing `Enter` will open the User Guide in a new window.
6. Some example commands you can try:
   - **`add`**`/t Do post-lecture quiz /s today 10:00 /e tomorrow 12:00 /c CS2103`: adds a task called `Do post-lecture quiz` to the Do-*er* List that starts `today` at `10:00` and ends `tomorrow` at `13:00` under the category `CS2103`.
   - **`list`** `CS2103`: lists all tasks in **CS2103**
   - **`delete`** `1`: deletes the 1st task shown in the current list
   - **`exit`**: exits the application
7. Refer to the Features section below for details of each command.

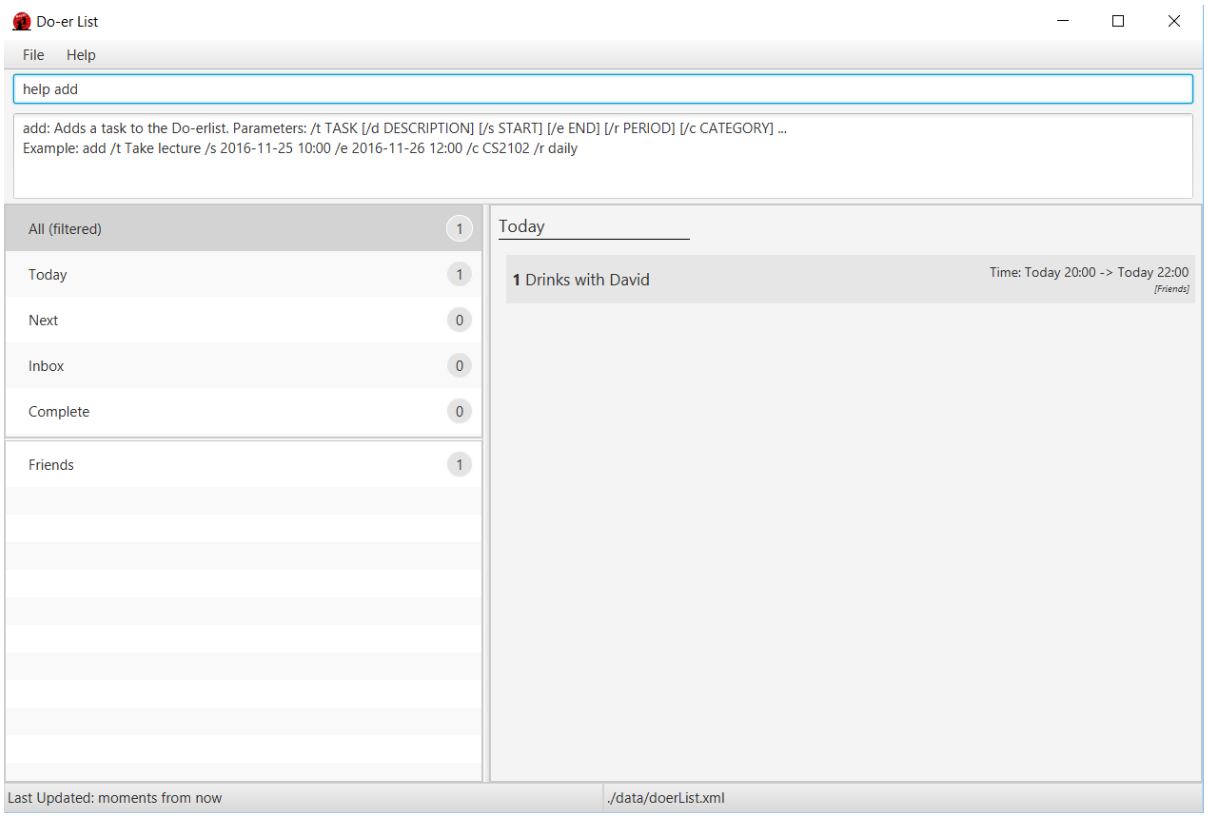
Features

Command Format

- Words in `UPPER_CASE` are the parameters.
- Items in `SQUARE_BRACKETS` are optional.
- Items with `...` after them can have multiple instances.
- If a command has multiple parameters, the order of parameters doesn't matter.

Viewing help: `help`

Format: `help` or `help [COMMAND_NAME]`



```
help add
```

```
add: Adds a task to the Do-erlist. Parameters: /t TASK [/d DESCRIPTION] [/s START] [/e END] [/r PERIOD] [/c CATEGORY] ...
Example: add /t Take lecture /s 2016-11-25 10:00 /e 2016-11-26 12:00 /c CS2102 /r daily
```

1 Drinks with David — Time: Today 20:00 -> Today 22:00 [Friends]

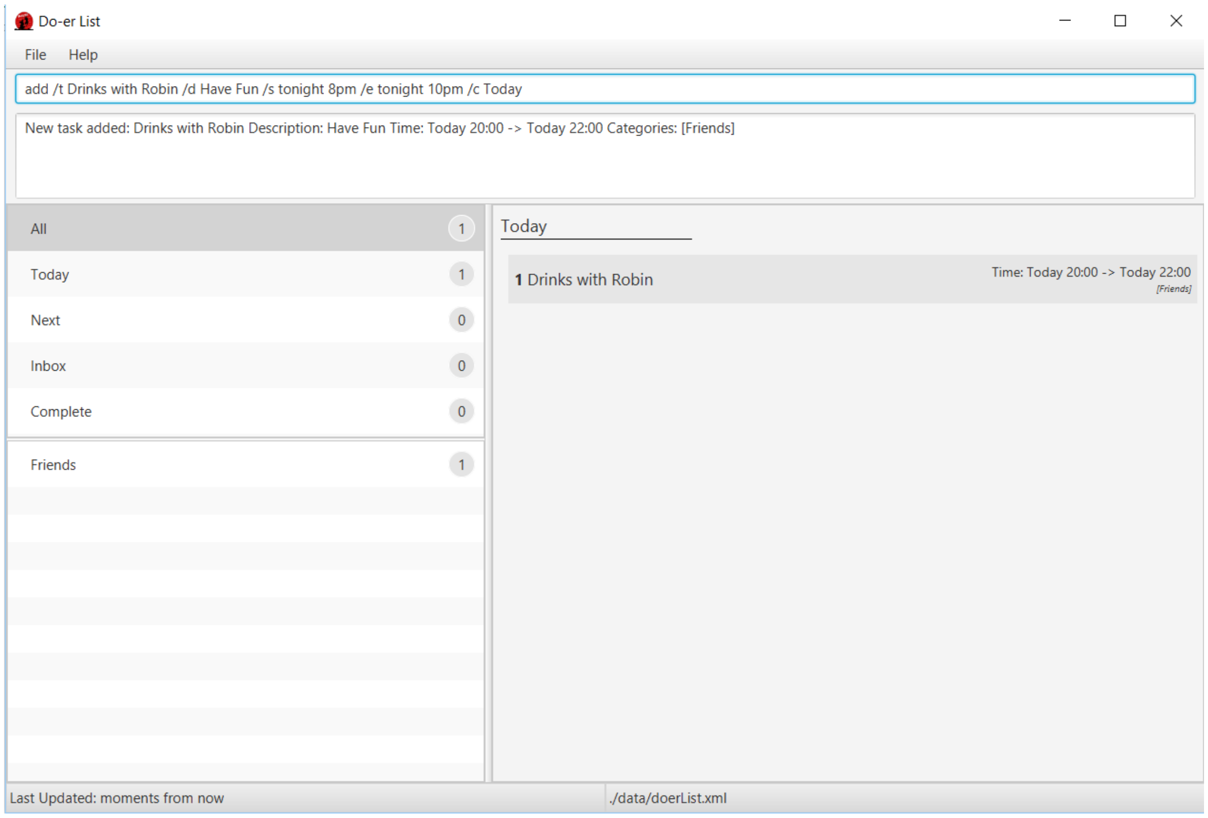
Last Updated: moments from now ./data/doerList.xml

If the `COMMAND_NAME` is supplied, it will display the instructions of using that command. Help is also shown if you enter an incorrect command e.g. `abcd`

Adding a task: `add`

Adds a task to the Do-*er*List

Format: `add /t TITLE [/d DESCRIPTION] [/s START] [/e END] [/c CATEGORY] [/r RECURRING] ...`



```
add /t Drinks with Robin /d Have Fun /s tonight 8pm /e tonight 10pm /c Today
```

```
New task added: Drinks with Robin Description: Have Fun Time: Today 20:00 -> Today 22:00 Categories: [Friends]
```

- You can choose to have no categories or any number of them in your task.
- The **`START`** or **`END`** parameter supports natural language input.
- **`RECURRING`** intervals can also be added in and supports in natural language input.
- If the **`START`** date is missing, the Do*er*-List set it to its current timing and date by default.
- If there is no **`START`** or **`END`** parameters, the Do*er*-list will create task without start date and end date and move it to **`Inbox`** default category.
- Supported list for natural language for **`START`** and **`END`**:
    - next X hours / days / weeks / months
        - *X* can be any number: 1, 2, 3, ...

    - today
    - tomorrow
    - next week / month
- Supported list for natural language for **`RECURRING`** tasks:
    - daily
    - weekly
    - monthly
    - yearly

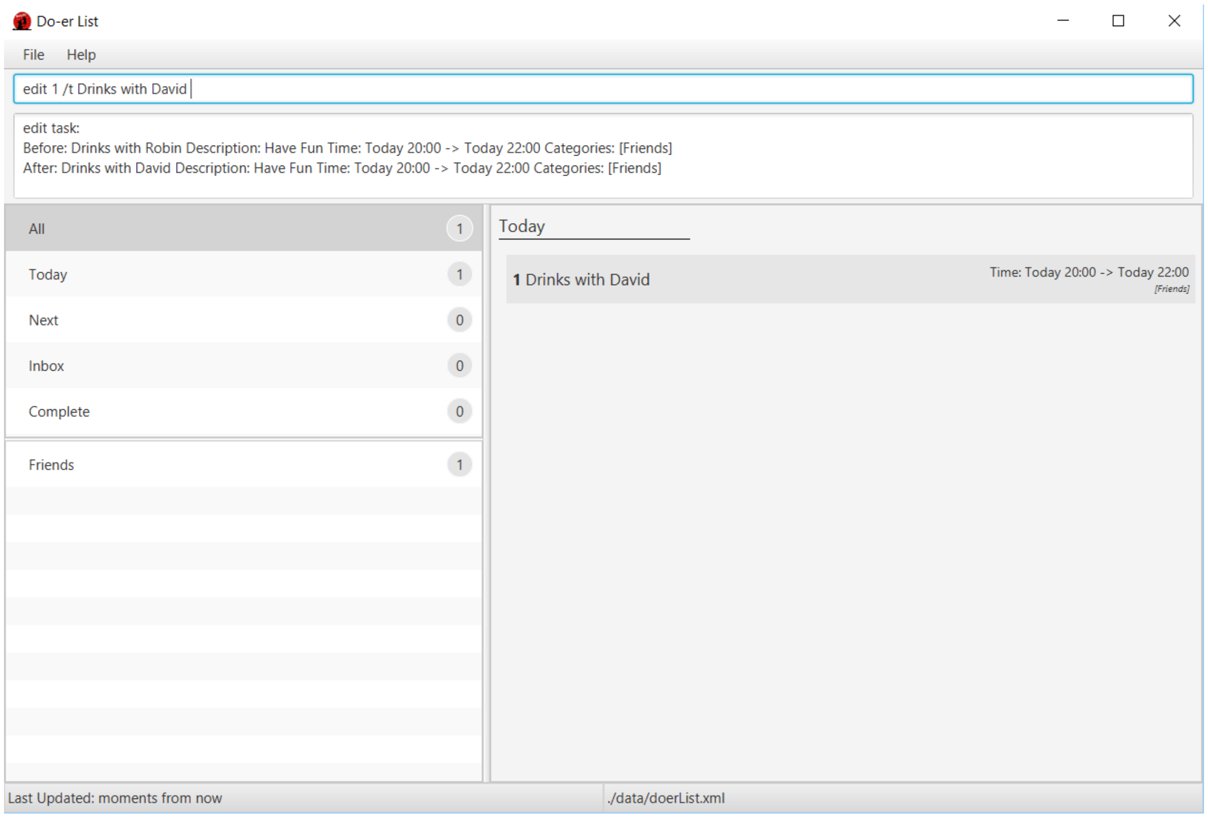
Examples:

- `add /t Weekly Laundry /s 2016-11-23 21:00 /c Chores`
- `add /t Daily Exercise and Workout!`
- `add /t Call Mum in Hanoi /d Limit chat timing for overseas charges /s tomorrow 8pm /e tomorrow 10pm /c Optional`
- `add /t Check Email /s tomorrow 8pm /e tomorrow 10pm /r daily`

Editing a task: `edit`

Edit an existing task in the Do-*er* List

Format: `edit INDEX [/t TITLE] [/d DESCRIPTION] [/s START] [/e END] [/c CATEGORY] [/r RECURRING] ...`



```
edit 1 /t Drinks with David
```

```
edit task:
Before: Drinks with Robin Description: Have Fun Time: Today 20:00 -> Today 22:00 Categories: [Friends]
After: Drinks with David Description: Have Fun Time: Today 20:00 -> Today 22:00 Categories: [Friends]
```

1 Drinks with David Time: Today 20:00 -> Today 22:00 [Friends]

Last Updated: moments from now ./data/doerList.xml

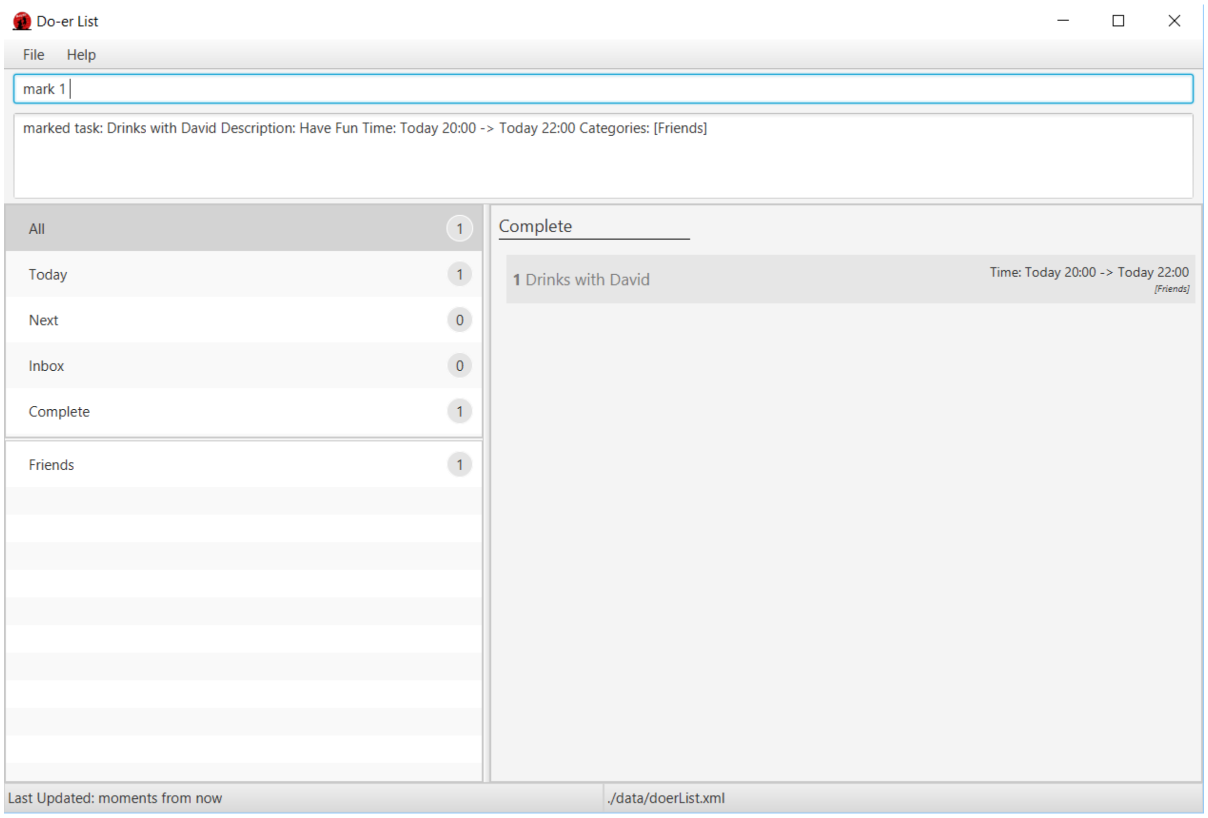
Edit an existing task by calling its index. The task's title, description, start date, end date, recurring intervals and categories can be edited.
Examples:

- `edit 2 /t Do the Laundry /c Chores /r Daily`
- `edit 3 /c Do Homework`
- `edit 3 /s tomorrow 23 00`

Attributes that are not supplied will not be updated

Mark task as done: `mark`

Marks a certain task as done in the Do*er*-list.
Format: `mark TASK_NUMBER`



```
mark 1
```

```
marked task: Drinks with David Description: Have Fun Time: Today 20:00 -> Today 22:00 Categories: [Friends]
```

1 Drinks with David — Time: Today 20:00 -> Today 22:00 [Friends]

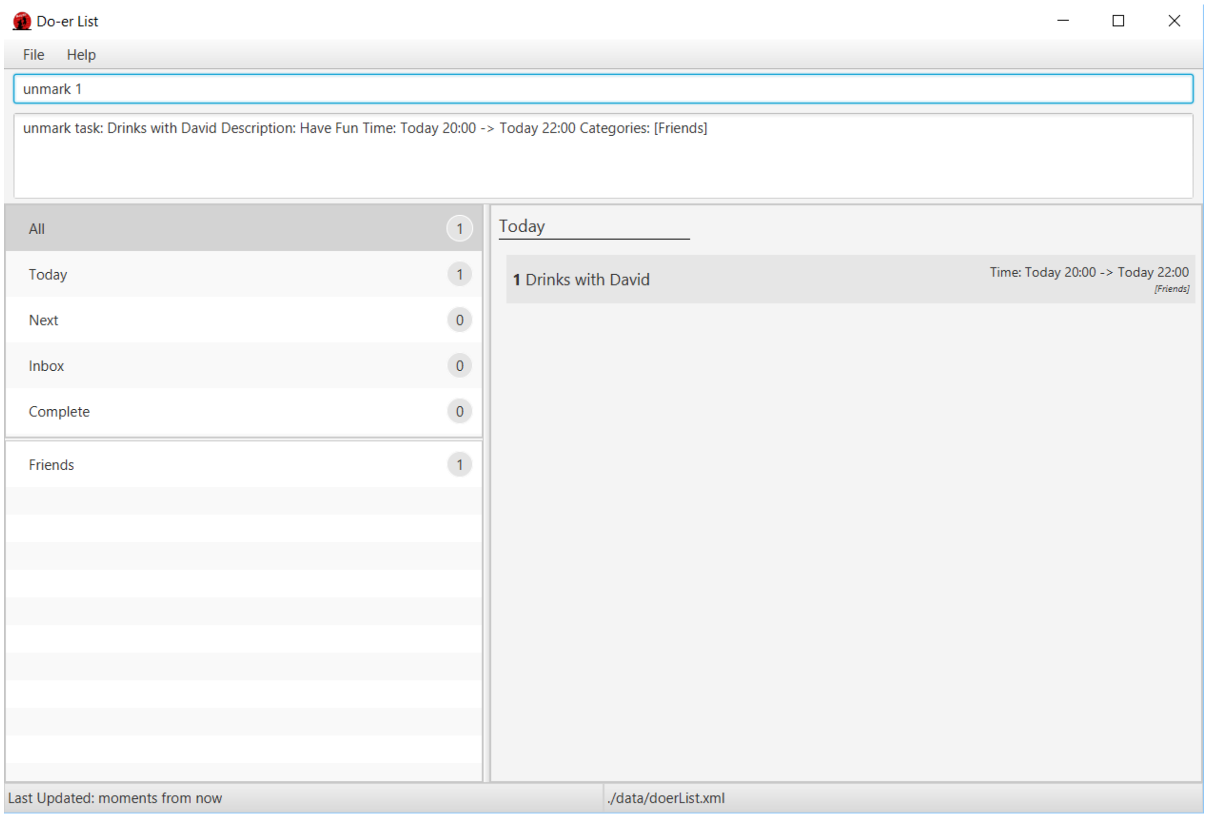
Last Updated: moments from now
./data/doerList.xml

Mark task `TASK_NUMBER` as done. The task must exist in the Do*er*-list.
Examples:

- `mark 5`
  - Returns task number `5` as done.
  - If a recurring task is mark is done, it will automatically update its start and end date.

Unmark task as done: `unmark`

Marks a certain task as undone in the Do*er*-list.
Format: `unmark TASK_NUMBER`



unmark 1

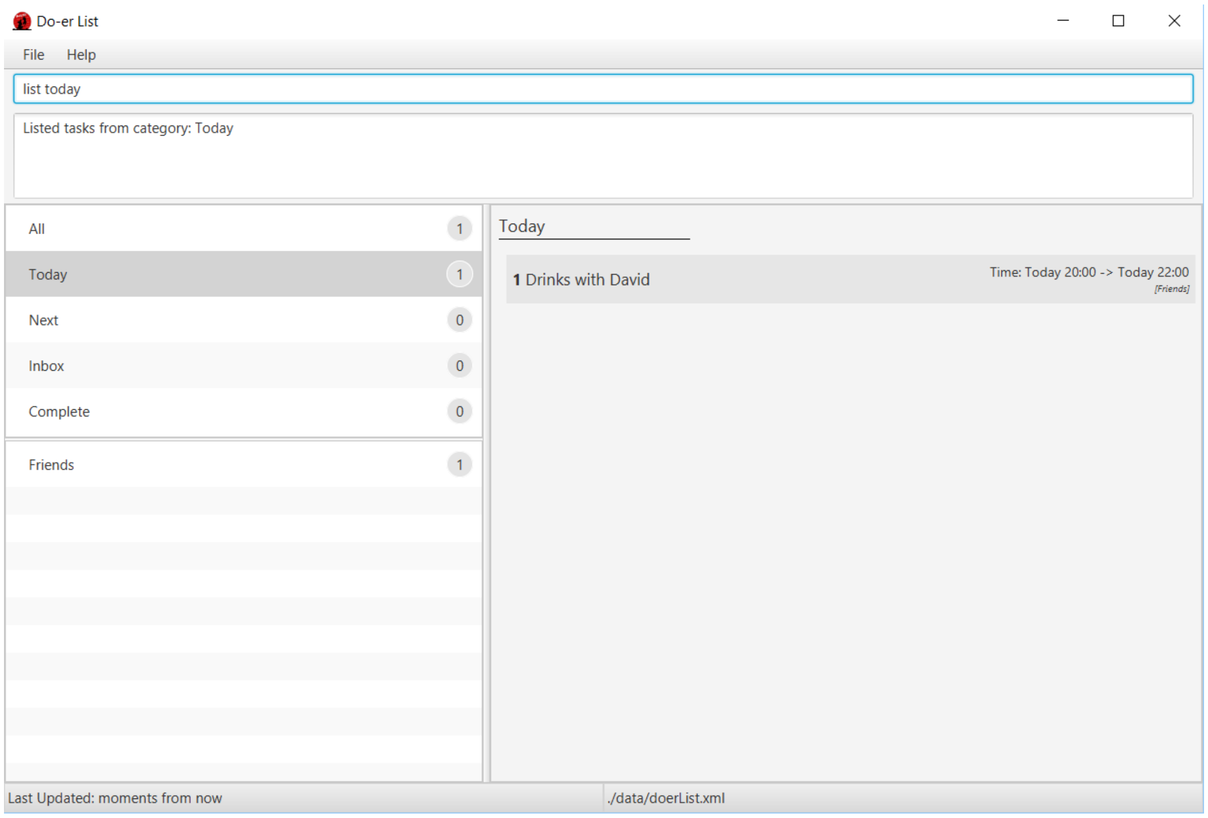
unmark task: Drinks with David Description: Have Fun Time: Today 20:00 -> Today 22:00 Categories: [Friends]

Mark task `TASK_NUMBER` as undone. The task must exist in the Do*er*-list.
Examples:

- `unmark 5`
  - Returns task number `5` as undone.
  - If a recurring task is mark is unmarked, it will automatically subtract its start and end date by its given recurring interval.

Listing tasks in a certain category: `list`

Shows a list of all tasks in the Doer-list under the specific category.
Format: `list [CATEGORY]`



list today

Listed tasks from category: Today

All	1
Today	1
Next	0
Inbox	0
Complete	0
Friends	1

Today

1 Drinks with David   Time: Today 20:00 -> Today 22:00 [Friends]

Last Updated: moments from now   ./data/doerList.xml

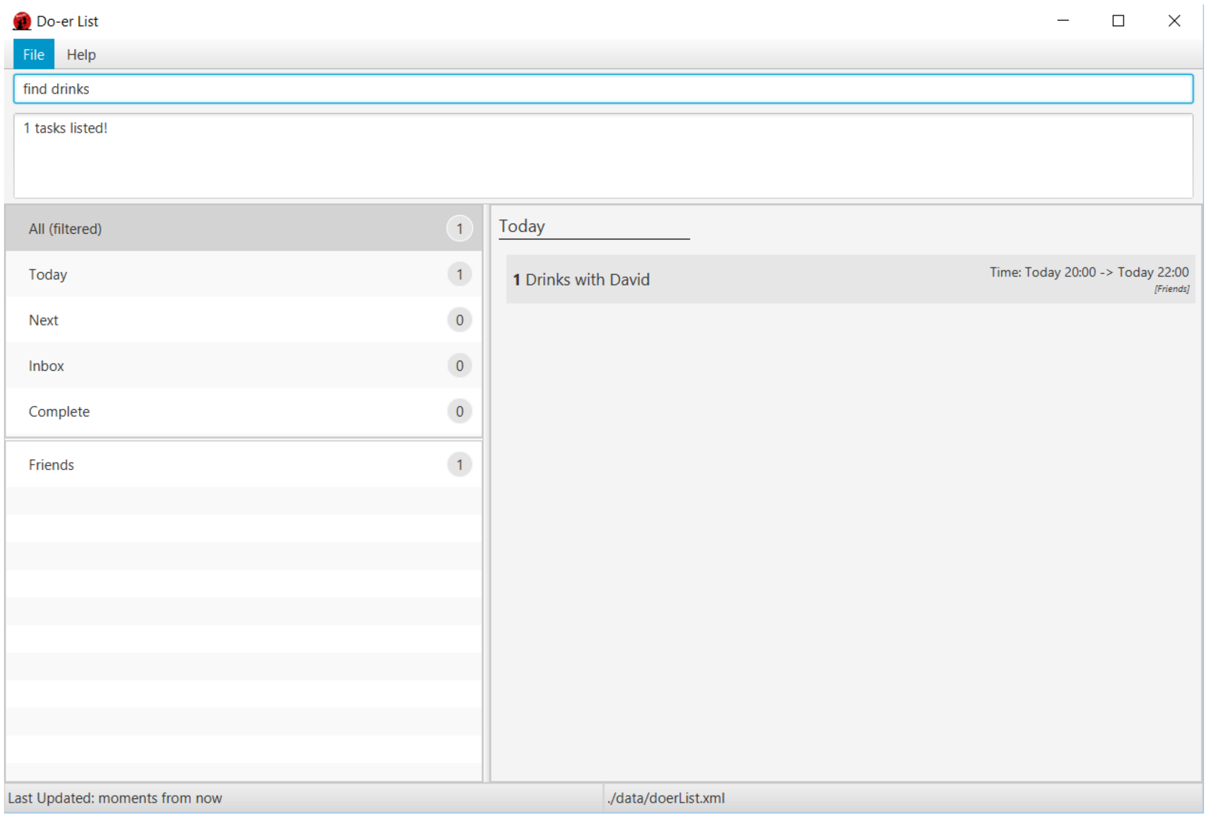
- If the `CATEGORY` or `DATE` parameter is not supplied, then it will list all tasks.
- Some build-in categories: `All` `Today` `Next` `Inbox` and `Complete` can be also listed.

Examples:

- `list`
- `list Friends`
- `list today`
- `list next`

Finding all tasks containing any keyword in their name: `find`

Finds tasks whose names contain any of the given keywords.
Format: `find KEYWORD [MORE_KEYWORDS]`



find drinks

1 tasks listed!

1 Drinks with David — Time: Today 20:00 -> Today 22:00 [Friends]

Last Updated: moments from now
./data/doerList.xml

- The search is not case sensitive.
  - `lecture` will match `LecTure`
- The order of the keywords does not matter.
  - `go to lecture` will match `Lecture go to`
- Title and Description is searched.
- All data in the Do-*er* List matching at least one keyword will be returned
  - `lecture` will match `have lecture`

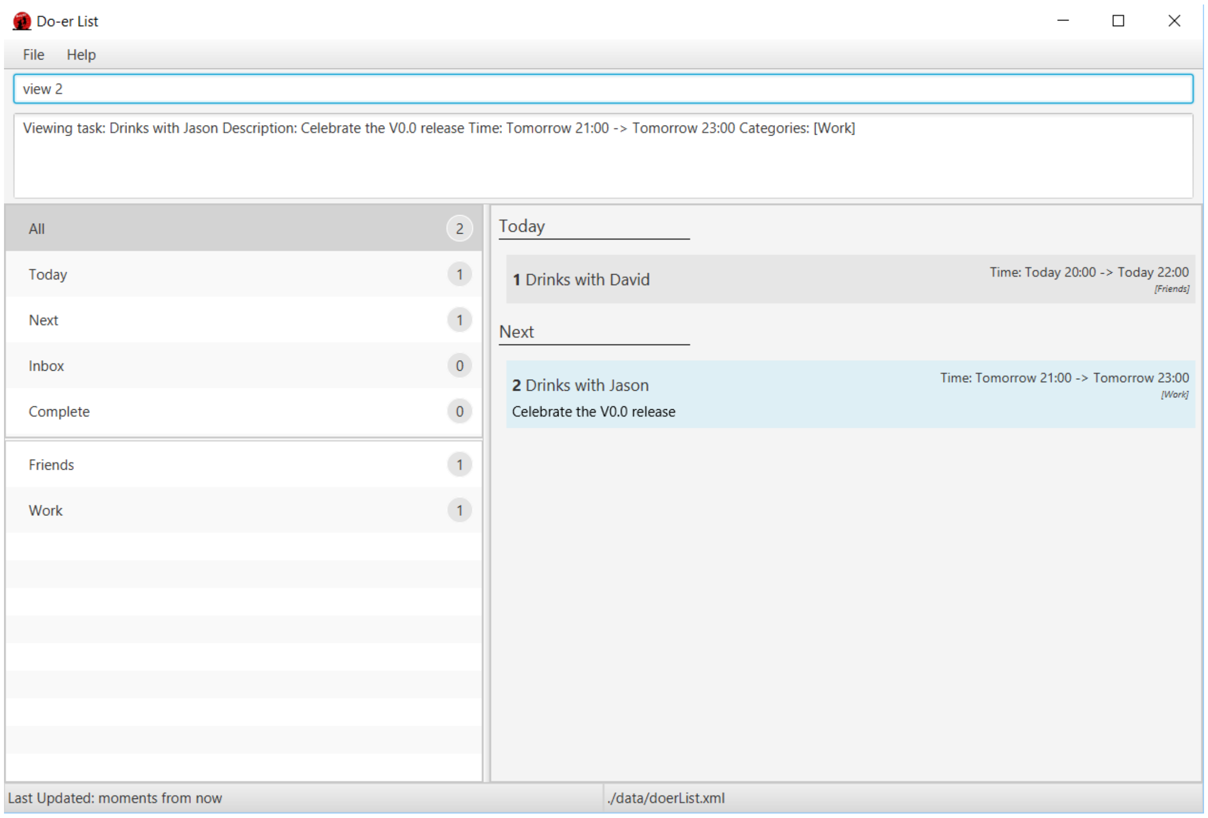
Examples:

- `find david`

  Returns `Drinks with David`

View a task: `view`

Views the task identified by the index number used in the task panel.
Format: `view INDEX`



view 2

Viewing task: Drinks with Jason Description: Celebrate the V0.0 release Time: Tomorrow 21:00 -> Tomorrow 23:00 Categories: [Work]

All	2
Today	1
Next	1
Inbox	0
Complete	0
Friends	1
Work	1

Today

1 Drinks with David — Time: Today 20:00 -> Today 22:00 [Friends]

Next

2 Drinks with Jason — Time: Tomorrow 21:00 -> Tomorrow 23:00 [Work]
Celebrate the V0.0 release

Last Updated: moments from now ./data/doerList.xml

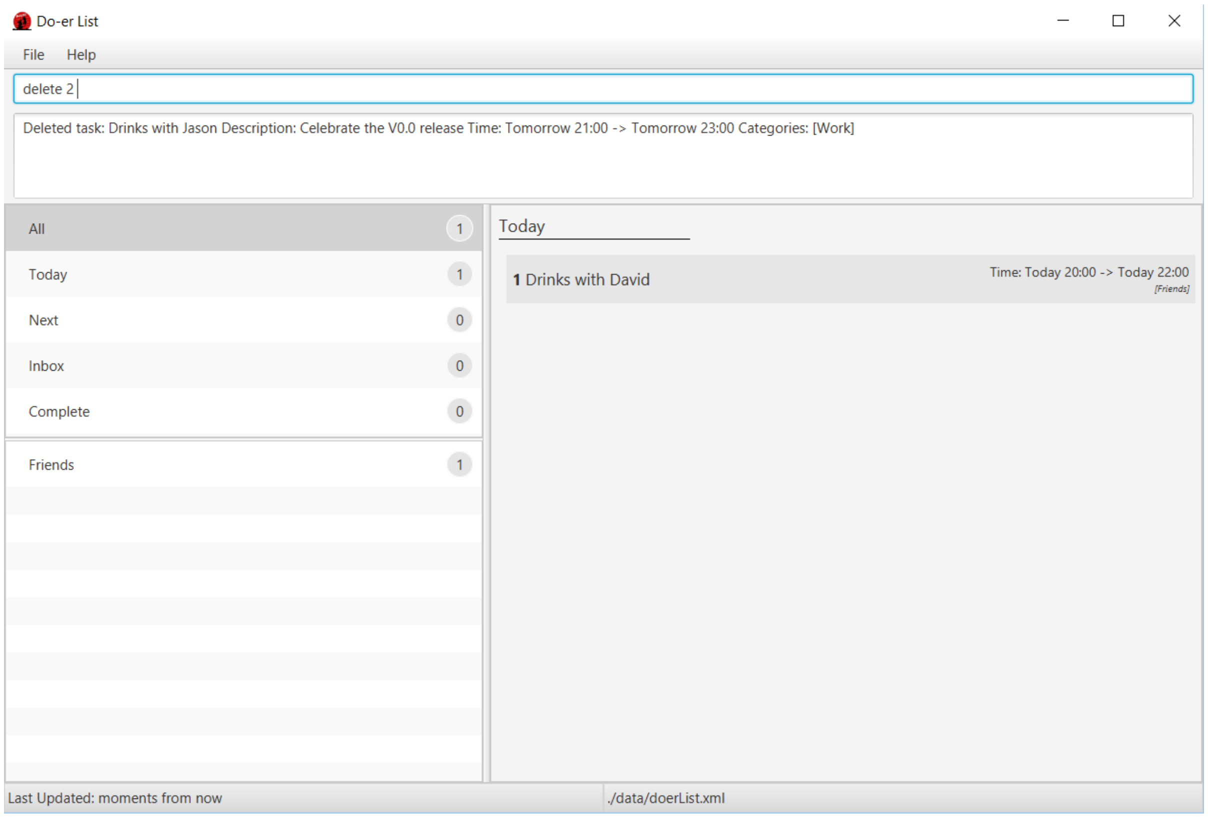
- Views the details of the task at the specified `INDEX`.
- The index refers to the index number shown in the most recent listing. The index **must be a positive integer** 1, 2, 3, ...

Examples:

- `list`
  `view 2`
  Views the 2nd task in the Do*er*-list.
- `find David`
  `view 1`
  Views the 1st task in the results of the `find` command.

Deleting a task: `delete`

Deletes the specified task / event from the Do-*er*List.
Format: `delete INDEX`



delete 2

Deleted task: Drinks with Jason Description: Celebrate the V0.0 release Time: Tomorrow 21:00 -> Tomorrow 23:00 Categories: [Work]

1 Drinks with David Time: Today 20:00 -> Today 22:00

Last Updated: moments from now ./data/doerList.xml

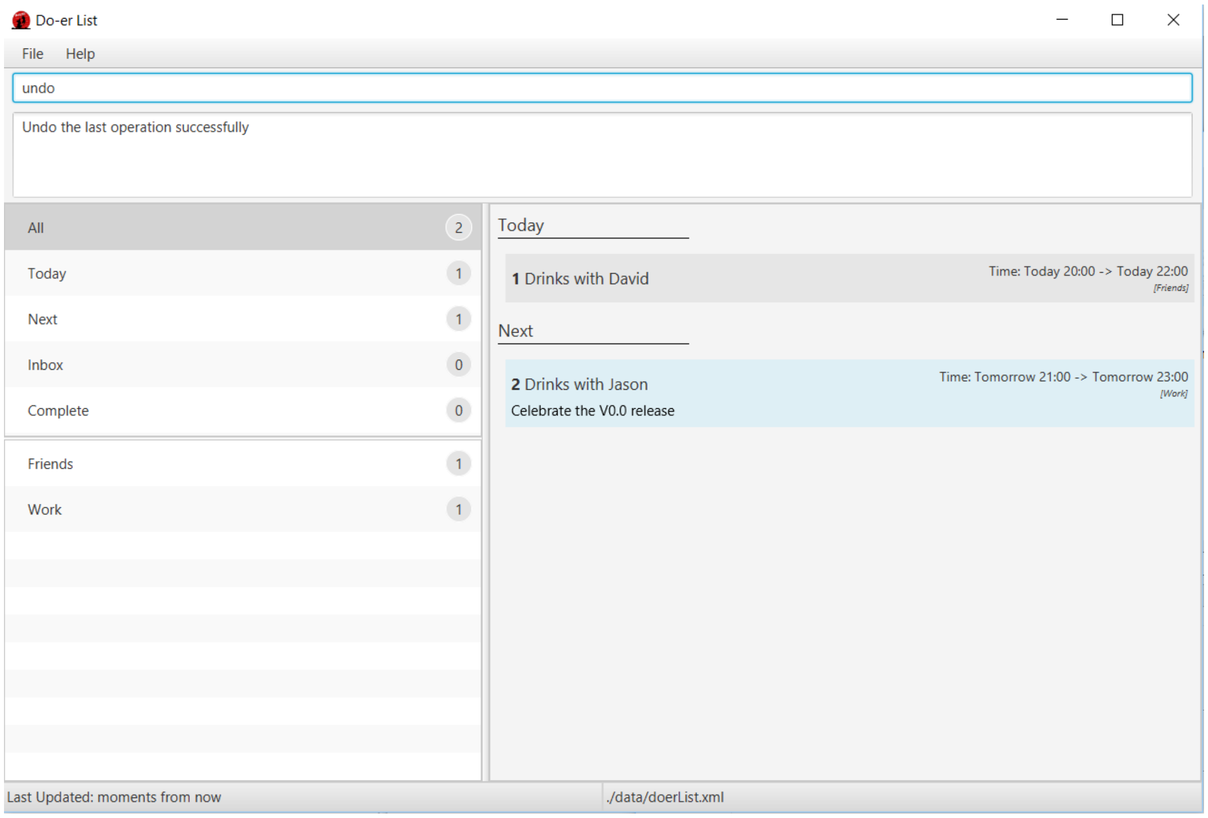
- Deletes the task / event at the specified `INDEX`.
- The index refers to the index number shown in the most recent listing.
  The index **must be a positive integer** 1, 2, 3, ...

Examples:

- `list`
  `delete 2`
  Deletes the 2nd task / event in the Do-*er*List.
- `find David`
  `delete 1`
  Deletes the 1st task / event in the results displayed by using the `find` command.

Undo the most recent operation: `undo`

Undo the most recent operation which modify the data in the Do*er*-list
Format: `undo`



undo

Undo the last operation successfully

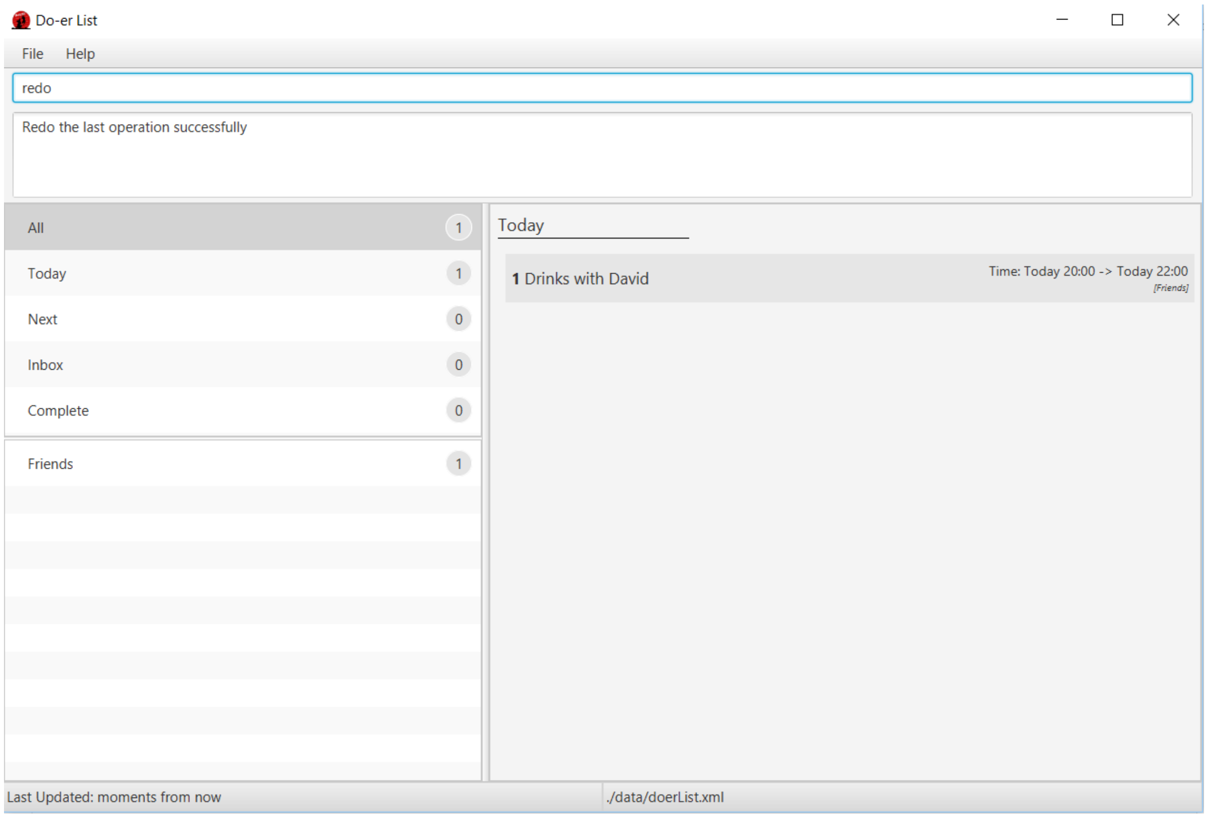
1 Drinks with David
Time: Today 20:00 -> Today 22:00
[Friends]

2 Drinks with Jason
Celebrate the V0.0 release
Time: Tomorrow 21:00 -> Tomorrow 23:00
[Work]

Last Updated: moments from now
./data/doerList.xml

Redo the most recent operation: `redo`

Redo the most recent undo
Format: `redo`



redo

Redo the last operation successfully

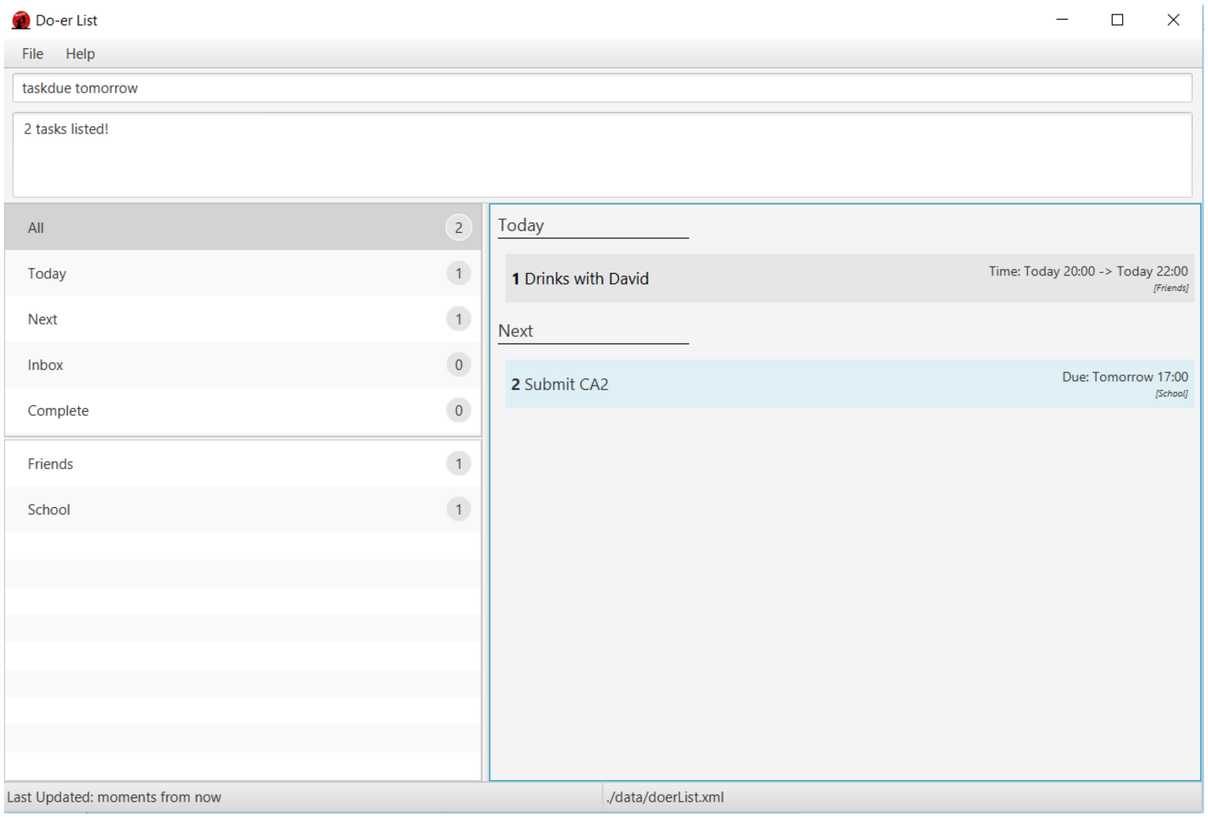
1 Drinks with David
Time: Today 20:00 -> Today 22:00
[Friends]

Last Updated: moments from now
./data/doerList.xml

An `undo` command must first be used before `redo` command can be executed.

Find all tasks due: `taskdue`

Finds all tasks due on and before the date specified in the Do*er*-list.
Format: `taskdue END_DATE`



taskdue tomorrow

2 tasks listed!

1 Drinks with David — Time: Today 20:00 -> Today 22:00 [Friends]

2 Submit CA2 — Due: Tomorrow 17:00 [School]

Last Updated: moments from now

./data/doerList.xml

- Finds all tasks due on and before `END_DATE`.
- The date can be in natural language*.
- Supported list for natural language*:
    - next X hours / days / weeks / months
        - *X* can be any number: 1, 2, 3, …
    - today
    - tomorrow
    - next week / month

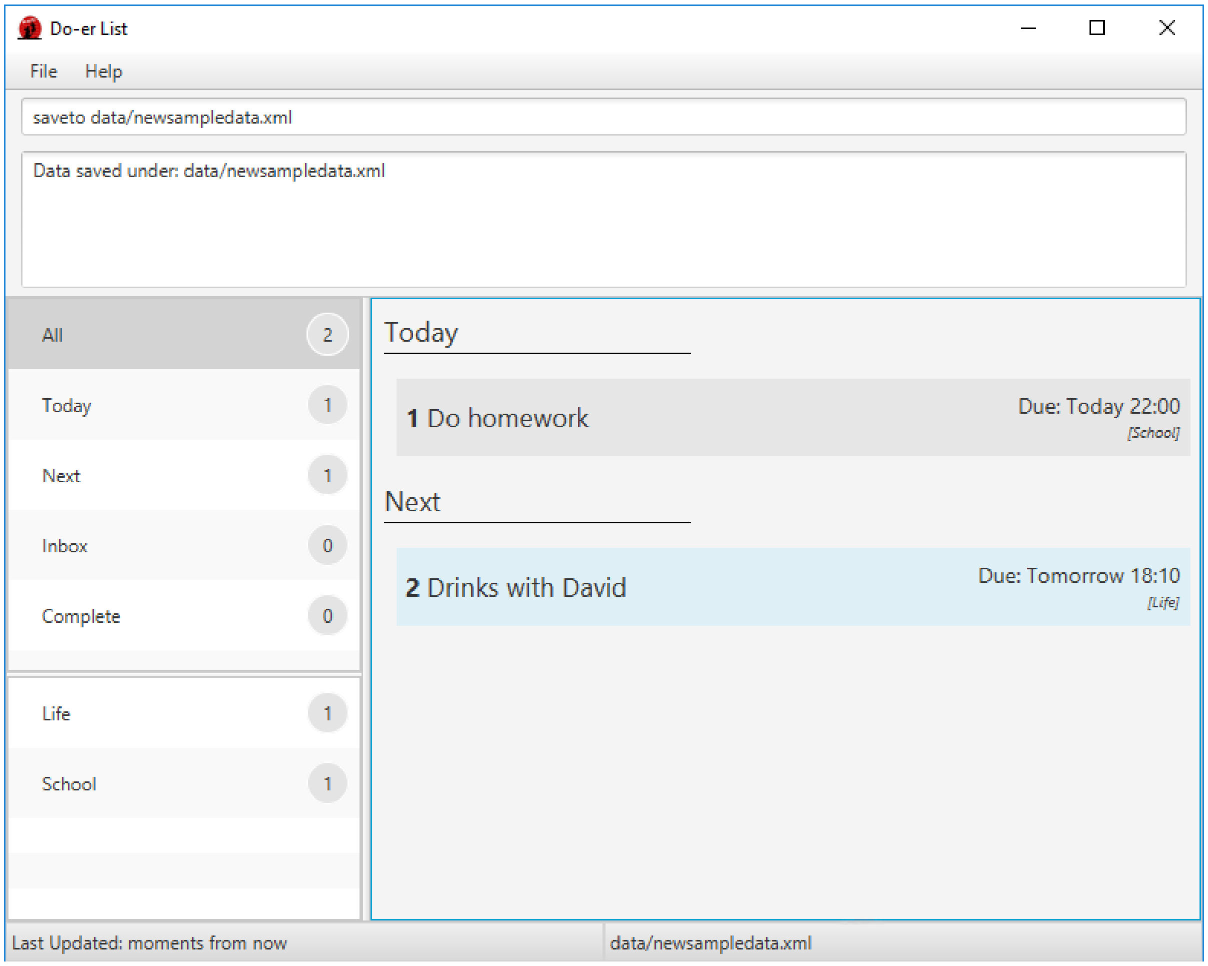
Examples:

- `taskdue tomorrow`
- `taskdue next 5 hours`
- `taskdue 2016-11-11 21:03`

Changing your save location: `saveto`

Save the data into a new file and location

Format: `saveto NEW_LOCATION`



```
saveto data/newsampledata.xml
```

```
Data saved under: data/newsampledata.xml
```

Today

1 Do homework — Due: Today 22:00 [School]

Next

2 Drinks with David — Due: Tomorrow 18:10 [Life]

Last Updated: moments from now | data/newsampledata.xml

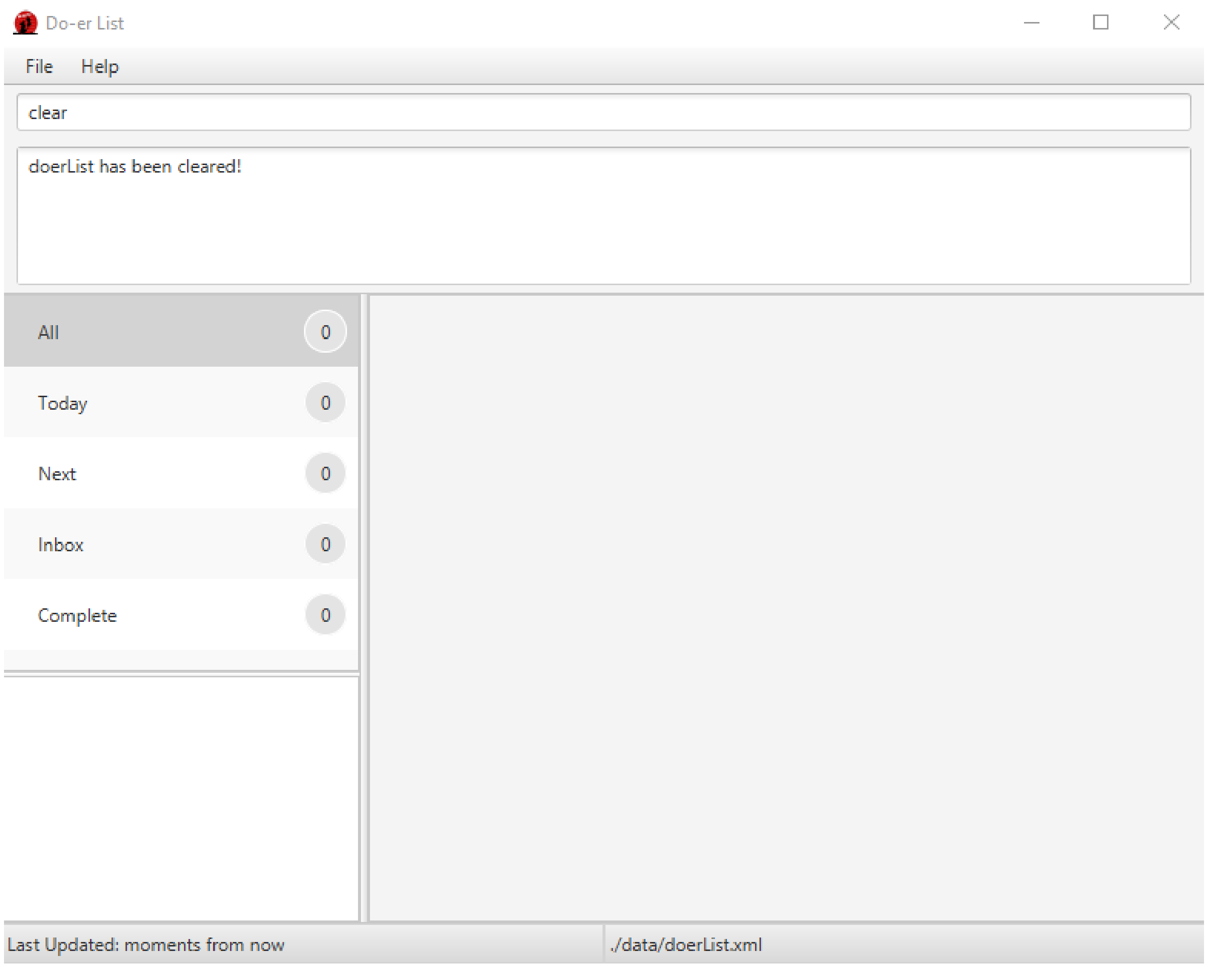
Examples:

- `saveto data/newsampledata.xml`

Clearing all the tasks: `clear`

Clearing all the tasks

Format: `clear`



```
clear
```

```
doerList has been cleared!
```

Last Updated: moments from now

./data/doerList.xml

Automatic save

The Do*er*-list data are saved in the hard disk automatically after any command that changes the data.

Exiting the program: `exit`

Exits the program.

Format: `exit`

FAQ

Q: How do I transfer my data to another computer?
A: Install the app in the other computer and overwrite the empty data file it creates with the file that contains the data of your previous Do-*er* List folder.

Q: Running "doerlist.jar" gives and error or does not seem to work.
A: You will need to install the latest version of Java. Refer to the installation guide here.

Q: Where is the save button for me to save my schedule in this program?
A: Your data are saved in the hard disk automatically after any command that changes the data as aforementioned here in the guide. There is no need for you to save it manually.

Command Summary

Command	**Format**
Help	`help [COMMAND]`
Add	`add /t TITLE [/d DESCRIPTION] [/s START] [/e END] [/c CATEGORY] [/r RECURRING] ...`
Edit	`edit INDEX [/t TITLE] [/d DESCRIPTION] [/s START] [/e END] [/c CATEGORY] [/r RECURRING] ...`
Mark Done	`mark TASK_NUMBER`
Mark Undone	`unmark TASK_NUMBER`
List	`list [CATEGORY]`
Find	`find KEYWORD [MORE_KEYWORDS]`
View	`view INDEX`
Delete	`delete INDEX`
Undo	`undo`
Redo	`redo`
Task Due	`taskdue END_DATE`
Save	`saveto NEW_LOCATION`
Exit	`exit`

Developer Guide

Setting up

Prerequisites

1. **JDK `1.8.0_60`** or later
   Having any Java 8 version is not enough.
   This application will not work with earlier versions of Java 8.

2. **Eclipse** IDE

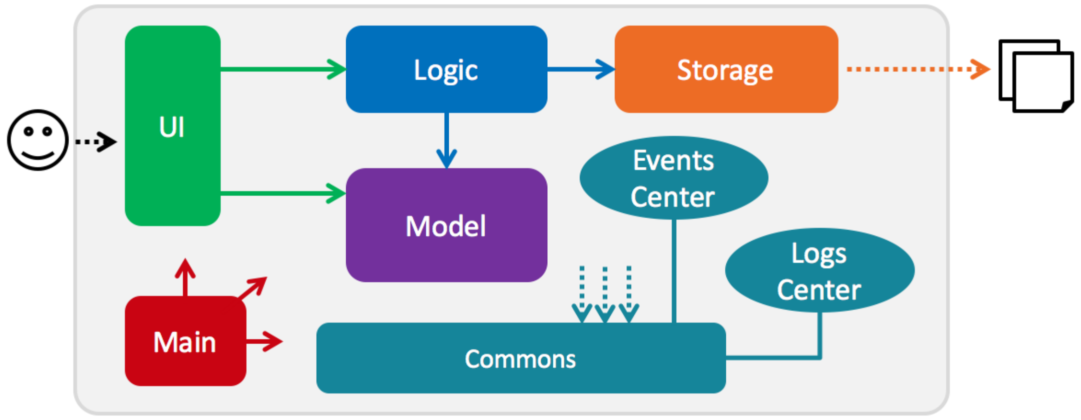
3. **e(fx)clipse** plugin for Eclipse (Do the steps 2 onwards given in this page)
4. **Buildship Gradle Integration** plugin from the Eclipse Marketplace

Importing the project into Eclipse

1. Fork this repository, and clone the fork to your computer.
2. Open Eclipse (Note: Ensure you have installed
   the **e(fx)clipse** and **buildship** plugins as given in the prerequisites above).
3. Click `File` > `Import`.
4. Click `Gradle` > `Gradle Project` > `Next` > `Next`.
5. Click `Browse`, then locate the project's directory.
6. Click `Finish`.
   - If you are asked whether to 'keep' or 'overwrite' config files, choose to 'keep'.
   - Depending on your connection speed and server load, it can even take up to 30 minutes for the set up to finish. (This is because Gradle downloads library files from servers during the project set up process.)
   - If Eclipse auto-changed any settings files during the import process, you can discard those changes.

Design

Architecture



The ***Architecture Diagram*** given above explains the high-level design of the App. Given below is a quick overview of each component.

`Main` has only one class called `MainApp`. It is responsible for,

- At application launch: Initializes the components in the correct sequence, and connects them up with each other.
- At shut down: Shuts down the components and invokes cleanup method where necessary.

`Commons` represents a collection of classes used by multiple other components. Two of those classes play important roles at the architecture level.

- `EventsCenter` : This class (written using Google's Event Bus library) is used by components to communicate with other components using events (i.e. a form of *Event Driven* design)
- `LogsCenter` : Used by many classes to write log messages to the application's log file.

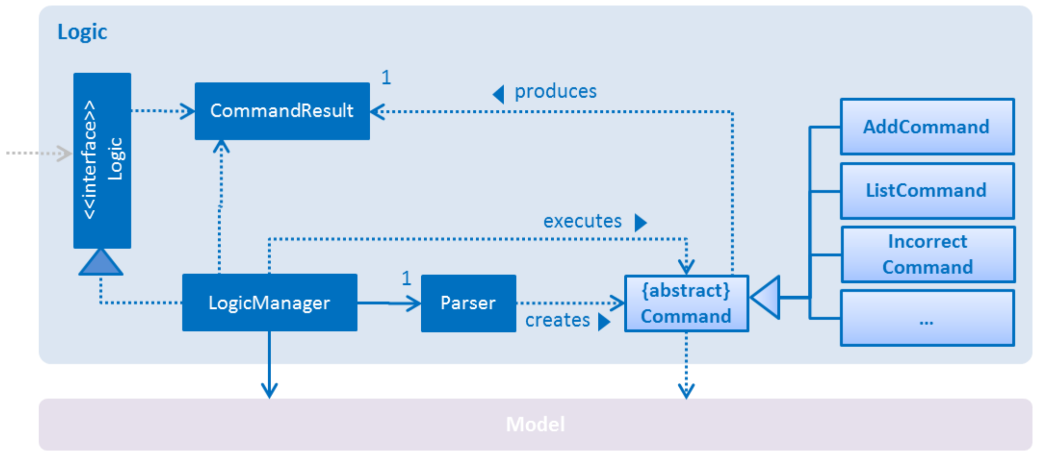
The rest of the application consists four components.

- `UI` : The UI of the application.
- `Logic` : The command executor.
- `Model` : Holds the data of the application in-memory.
- `Storage` : Reads data from, and writes data to, the hard disk.

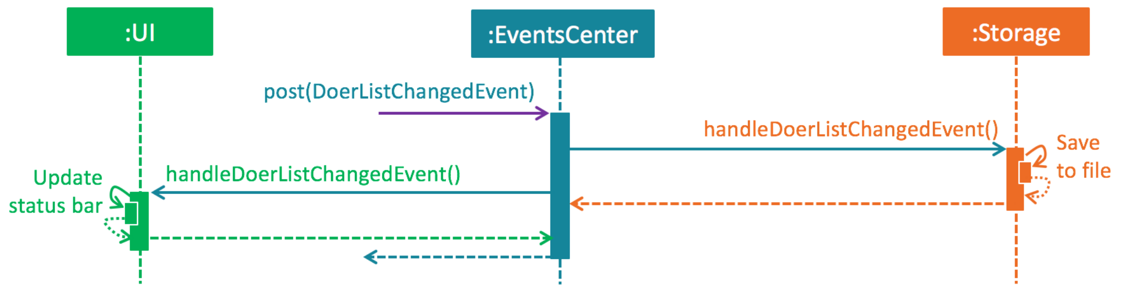
Each of the four components

- Defines its *API* in an `interface` with the same name as the Component.
- Exposes its functionality using a `{Component Name}Manager` class.

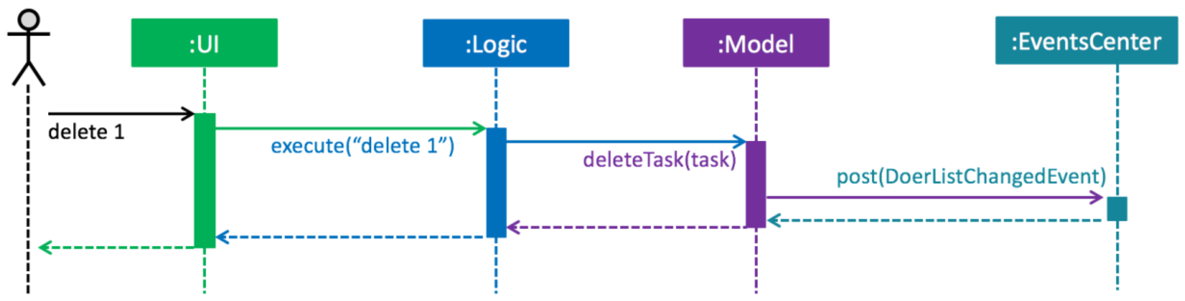
For example, the `Logic` component (see the class diagram given below) defines its API in the `Logic.java` interface and exposes its functionality using the `LogicManager.java` class.



The *Sequence Diagram* below shows how the components interact for the scenario where the user issues the command `delete 3`.

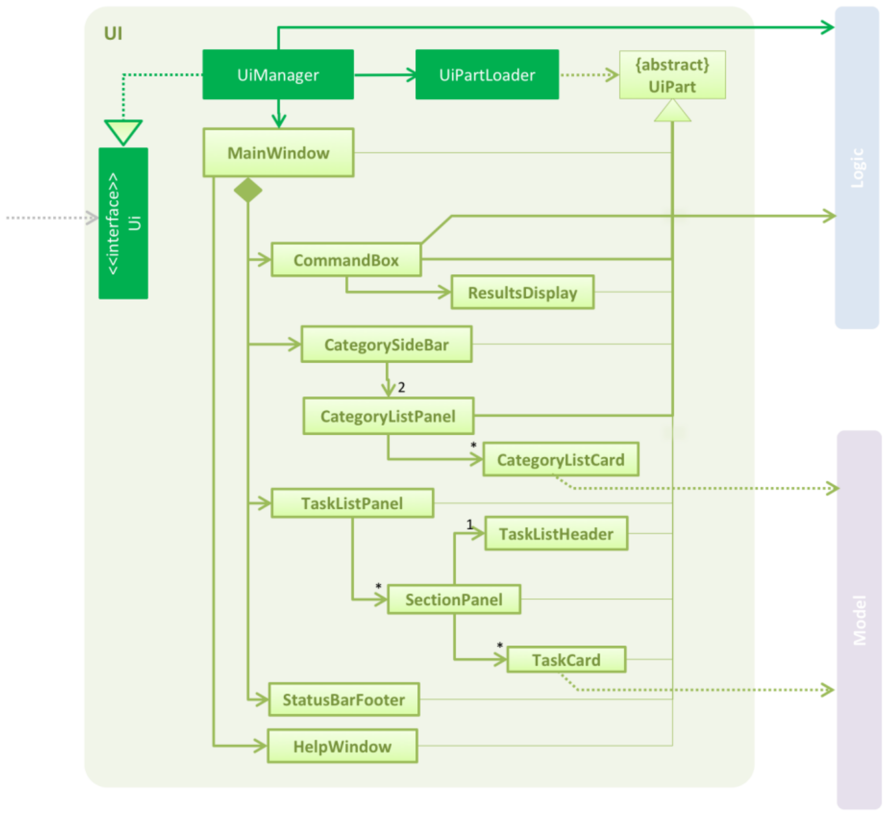

:UI
:EventsCenter
:Storage
post(DoerListChangedEvent)
handleDoerListChangedEvent()
Save to file
Update status bar
handleDoerListChangedEvent()

Note how the `Model` simply raises a `DoerListChangedEvent` when the Do-er List data are changed, instead of asking the `Storage` to save the updates to the hard disk.
The diagram below shows how the `EventsCenter` reacts to that event, which eventually results in the updates being saved to the hard disk and the status bar of the UI being updated to reflect the 'Last Updated' time.



Note how the event is propagated through the `EventsCenter` to the `Storage` and `UI` without `Model` having to be coupled to either of them. This is an example of how this Event Driven approach helps us reduce direct coupling between components.
The sections below give more details of each component.

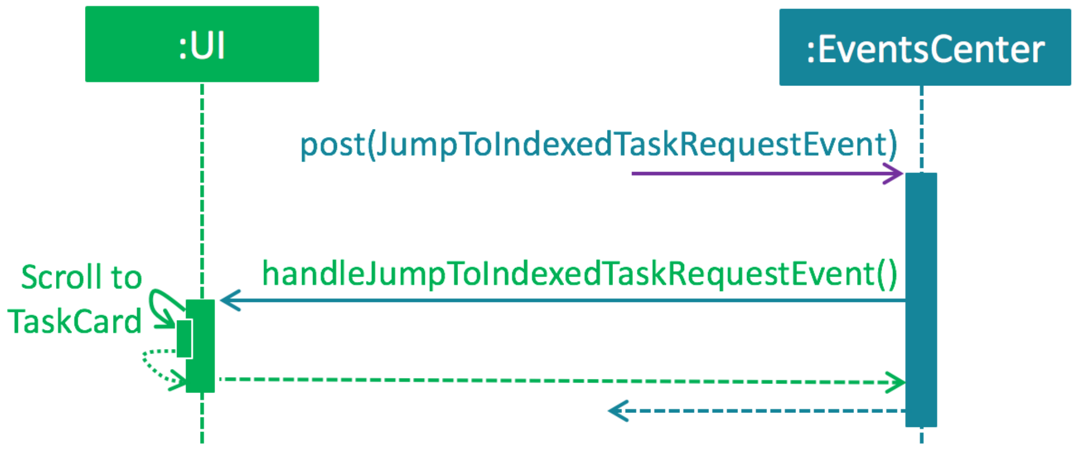
UI component



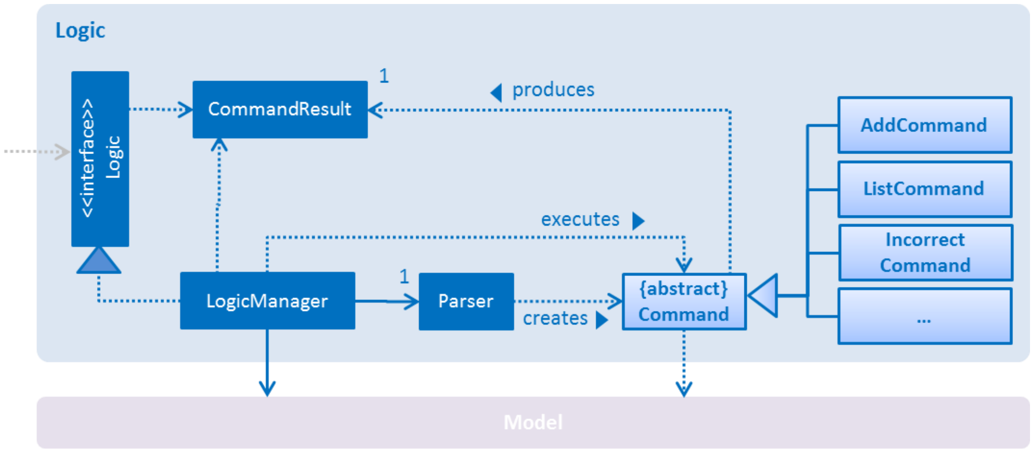
API : `Ui.java`
The UI consists of a `MainWindow` that is made up of parts e.g.`CommandBox`, `ResultDisplay`, `TaskListPanel`, `StatusBarFooter`etc. All these, including the `MainWindow`, inherit from the abstract `UiPart` class and they can be loaded using the `UiPartLoader`.
The `UI` component uses JavaFx UI framework. The layout of these UI parts are defined in matching `.fxml` files that are in the `src/main/resources/view` folder.
For example, the layout of the `MainWindow` is specified in `MainWindow.fxml`
The `UI` component,

- Executes user commands using the `Logic` component.

- Binds itself to some data in the `Model` so that the UI can auto-update when data in the `Model` change.
- Responds to events raised from various parts of the application and updates the UI accordingly. For example, the diagram below shows how the `UI` reacts to the `JumpToIndexedTaskRequestEvent` event.


:UI
:EventsCenter
post(JumpToIndexedTaskRequestEvent)
handleJumpToIndexedTaskRequestEvent()
Scroll to TaskCard

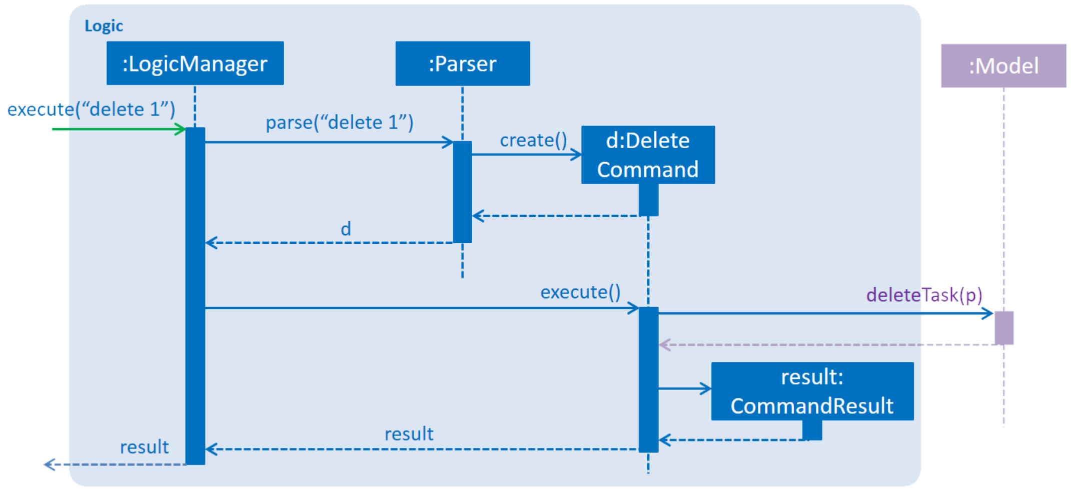
Logic component



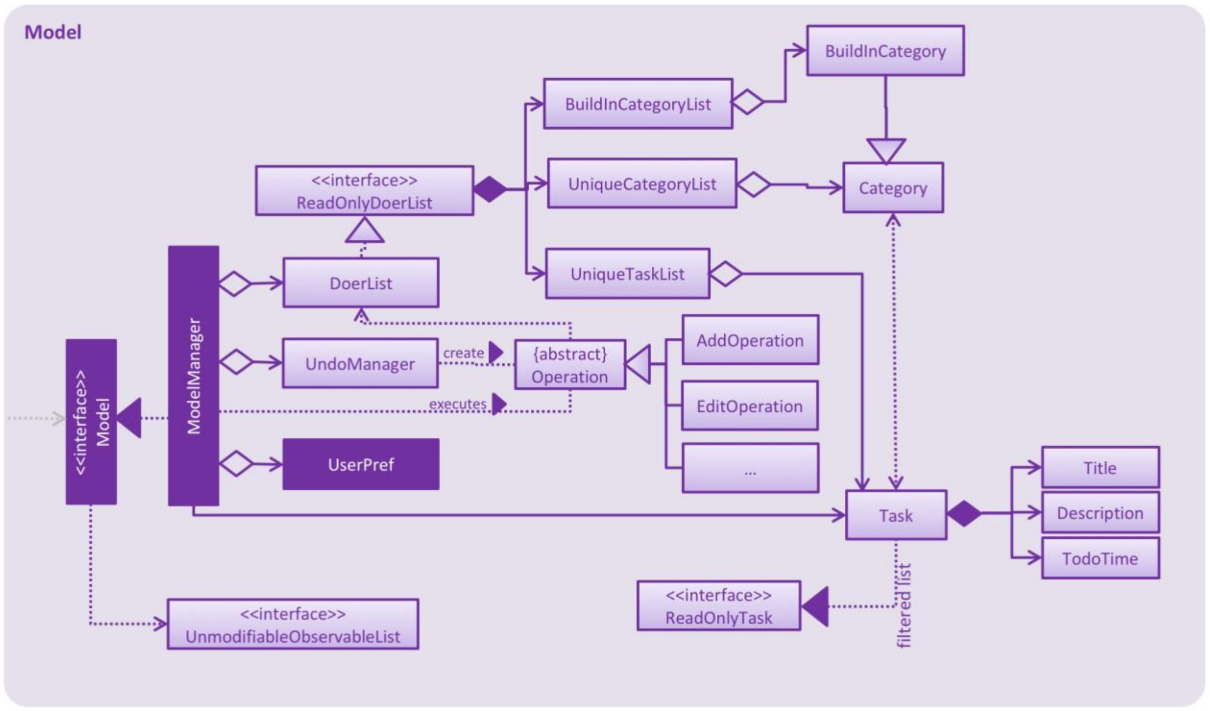
API : `Logic.java`

1. `Logic` uses the `Parser` class to parse the user command.
2. This results in a `Command` object which is executed by the `LogicManager`.
3. The command execution can affect the `Model` (e.g. adding a task) and/or raise events.
4. The result of the command execution is encapsulated as a `CommandResult` object which is passed back to the `Ui`.

Given below is the Sequence Diagram for interactions within the `Logic` component for the `execute ("delete 1")` API call.



Model component



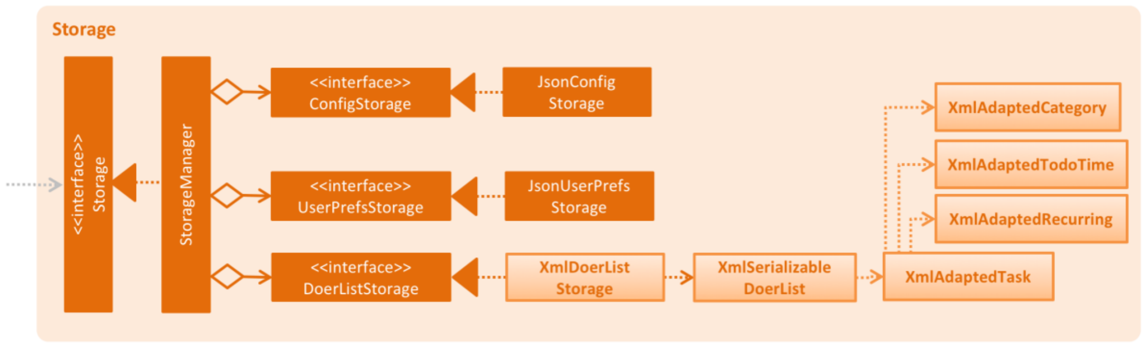
API : `Model.java`

The `Model`,

- stores a `UserPref` object that represents the user's preferences.
- stores the Do-er List data.
- stores a `UndoManager` that records the history operations to Do-er List data.
  For example, when `Model` requests to add a task to Doer List, `UndoManager` will records the opposites operations (delete a task in this case) in its undo stack. Next time, when the `undo` method of the `Model` is called, `Model` will pull the first operation in the `UndoManager` and executes it. Meanwhile, `UndoManager` will push the operation to its redo stack. Therefore, next time when `redo` method is called, the `Model` could pull the first operation in `UndoManager`'s redo stack and executes it.

- exposes `UnmodifiableObservableList<ReadOnlyTask>`, `UnmodifiableObservableList<Category>` that can be 'observed' (E.g. the UI can be bound to this list) so that the UI automatically updates when the data in the list changes.
- does not depend on any of the other three components.

Storage component



API : `Storage.java`
The `Storage` component,

- can save `Config` objects in json format and read it back
- can save `UserPref` objects in json format and read it back.
- can save the Do-er List data in xml format and read it back.

Common classes

Classes used by multiple components are in the `seedu.doerList.commons` package. Some of them are below:

- `EventsCenter.java` : The class is responsible for post events and handling events. When an event has been raised, the `EventsCenter` will check whether there is handler for the event and notify the correct handlers.
- `LogsCenter.java`: The class is responsible for recording the operation histories in execution. The records are useful for programmer in debugging.
- `BaseEvent.java`: The is the super class for every single event raised by the application.

Implementation

Logging

We are using `java.util.logging` package for logging. The `LogsCenter` class is used to manage the logging levels and logging destinations.

- The logging level can be controlled using the `logLevel` setting in the configuration file. (See Configuration)
- The `Logger` for a class can be obtained using `LogsCenter.getLogger(Class)` which will log messages according to the specified logging level.
- Currently log messages are outputted through `Console` and to a `.log` file.

Logging Levels

- `SEVERE`: Critical problem detected which may possibly cause the termination of the application.
- `WARNING`: Can continue, but proceed with caution.
- `INFO`: Information showing the noteworthy actions by the application.
- `FINE`: Details that is not usually noteworthy but may be useful in debugging. e.g. print the actual list instead of just its size.

Configuration

Certain properties of the application can be controlled (e.g App name, logging level) through the configuration file. (default: `config.json`):

Testing

Tests can be found in the `./src/test/java` folder.
In Eclipse:

If you are not using a recent Eclipse version (i.e. *Neon* or later), enable assertions in JUnit tests as described here.

- To run all tests, right-click on the `src/test/java` folder and choose `Run as > JUnit Test`
- To run a subset of tests, you can right-click on a test package, test class, or a test and choose to run as a JUnit test.

Using Gradle:

- See UsingGradle.md for how to run tests using Gradle.

We have two types of tests:

1. **GUI Tests** - These are *System Tests* that test the entire application by simulating user actions on the GUI. These are in the `guitests` package.

2. **Non-GUI Tests** - These are tests that do not involve the GUI. They include:

    i. *Unit tests* targeting the lowest level methods/classes.
    e.g. `seedu.doerList.commons.UrlUtilTest`
    ii. *Integration tests* that are checking the integration of multiple code units (those code units are assumed to be working).
    e.g. `seedu.doerList.storage.StorageManagerTest`
    iii. Hybrids of unit and integration tests. These tests are checking multiple code units as well as how the are connected together.
    e.g. `seedu.doerList.logic.LogicManagerTest`

Headless GUI Testing: Thanks to the TestFX library that we are using, our GUI tests can be run in *headless* mode. In the headless mode, GUI tests do not show up on the screen.

That means the developer can do other things on his computer while the tests are running.

See UsingGradle.md to learn how to run tests in headless mode.

Dev Ops

Build Automation

See UsingGradle.md to learn how to use Gradle for build automation.

Continuous Integration

We use Travis CI to perform *Continuous Integration* on our projects.
See UsingTravis.md for more details.

Making a Release

Here are the steps to create a new release.

1. Generate a JAR file using Gradle.
2. Tag the repository with the version number. e.g. `v0.1`
3. Create a new release using GitHub and upload the JAR file your created.

Managing Dependencies

A project often depends on third-party libraries. For example, Do-er List depends on the Jackson library for XML parsing. Managing these *dependencies* can be automated using Gradle. For example, Gradle can download the dependencies automatically, which is better than these alternatives.
a. Include those libraries in the repository (this bloats the repo size)
b. Require developers to download the necessary libraries manually (this creates extra work for developers)

Appendix A : User Stories

Priorities: High (must have) - * * *, Medium (nice to have) - * *, Low (unlikely to have) - *

Priority	As a ...	I want to ...	So that I can...
* * *	new user	see the usage instructions of all commands	how to use various commands in the application
* * *	user	create task with title and description	put summary as title and more details in the description
* * *	user	create task without start or end time	record tasks that need to be done without deadlines
* * *	user	create task with start and end time or deadlines	know what task I should be doing or due on a certain timing
* * *	user	edit task's title, description, start time, end time and categories	update it when I want to in the event I need to make some changes instead of creating a new task
* * *	user	view all tasks	have an overview of all the tasks

Priority	As a ...	I want to ...	So that I can...
* * *	user	view a specific task	get more details of the specific task
* * *	user	find a task by title and description	quickly locate the task if I can only remember few words in the title or description
* * *	user	delete tasks	track only the required tasks
* *	user	add tasks to different categories	organise my tasks properly
* *	user	view the tasks under a certain category	examine different tasks under different categories
* *	user	view the tasks are going to happen or due today, tomorrow, next 7 days, etc.	know what is going to happen in the coming day(s)
* *	user	undo the most recent operations	revert the changes when I make a wrong command by mistake
* *	user	redo the most recent	redo the operation after undoing it

Priority	As a …	I want to …	So that I can…
		operations	
* *	user	specify a storage location for data storage	specify my data location to the cloud syncing service provider to prevent data loss
* *	user	mark or unmark the task as done	only need to keep track of the tasks which are needed to be done and archive the finished tasks
*	user	type command parameters in arbitrary order	find the specific order of parameter(s) in the event I forget
*	user	add external `ical` file to the todo-lists	keep track of tasks created by other applications.
*	user	create recurring tasks	be reminded to do the same task at the same time interval
*	user	view events in Google Calendar	have a better pictorial view of my schedule

Appendix B: Use Cases

(For all use cases below, the **System** is the `Do-er List` and the **Actor** is the `user`, unless specified otherwise)

Use case: Add task

MSS

1. User requests to add a task in.
2. System creates task with title, description, start date, end date, recurring interval.
3. The task is moved into the categories according to the supplied parameters.
4. System displays the details of the created task.
   Use case ends.

Extensions

1a. `add` command followed by the wrong parameters.
  1a1. System indicates the error and displays the correct format for user.
  Use case ends.
2a. `TITLE` is empty string.
  2a1. System indicates the error that `TASK_NAME` is empty.
  Use case ends.
2b. User does not supply `START` or `END` parameters.
  2b1. Task is created and categorized to `INBOX`.
  2b2. System display the created task.
  Use case resumes from step 2.
2c. User does not supply `START` parameter.
  1c1. Task is created with `START` as today.
  Use case resumes from step 2.
2d. System can parse `START` or `END`, which are not in standard format.
  Use case resumes from step 2.
2e. System is unable to parse `START` or `END`, which are not in standard format.

2e1. System indicates the error to user.
Use case resumes from step 2.

2f. `START` time is after `END` time
2f1. System indicates the error to user
Use case ends

2g. There is not `START` time or `END` time while `recurring` interval is supplied
2g1. System indicates the error to user
Use case ends

3a. The category does not exist in the system
3a1. System creates a new category
Use case resumes from step 3

3b. The category does not exist in the system
3b1. System creates a new category
3b2. The category name is invalid
3b3. System indicates the error
Use case ends

Use case: Edit task

MSS

1. User types in the command.
2. System finds the task at that index.
3. A new task is created based on new attributes and old attributes. (E.g. title, description, start time, end time, recurring interval, category).
4. System replaces the old task with new task.
5. System displays the details of the newly edited task.
   Use case ends.

Extensions

1a. `edit` command followed by the wrong parameters.
  1a1. System indicates the error and display the correct format for user.
  Use case ends.
2a. `edit` command is followed by the non-existent `INDEX`.
  2a1. System indicates the error that the `INDEX` is non-existent
  Use case ends.
3a. System can parse `START` or `END`, which are not in standard format.
  Use case resumes from step 2.
3b. System is unable to parse `START` or `END`, which are not in standard format.
  3b1. System indicates the error to user.
  Use case resumes from step 2.
3c. `START` time is after `END` time
  3c1. System indicates the error to user
  Use case ends
3d. There is not `START` time or `END` time while `recurring` interval is supplied
  3d1. System indicates the error to user
  Use case ends
3e. The category does not exist in the system
  3e1. System creates a new category
  Use case resumes from step 3

3f. The category does not exist in the system

    3f1. System creates a new category
    3f2. The category name is invalid
    3f3. System indicates the error
    Use case ends

4a. The replacement of task results in duplication in task list

    4a1. System indicates the error
    Use case ends

Use case: Delete task

MSS

1. User types in the command.
2. System finds the task at that index.
3. System deletes the task.
   Use case ends.

Extensions

1a. `delete` command is followed by the wrong parameters
  1a1. System indicates error and display the correct format to user.
  Use case ends.
1b. `delete` command is followed by a non-existent `INDEX`
  1b1. System indicates the error in the `INDEX` is non-existent.
  Use case ends.

Use case: List task by category

MSS

1. User types the command with `CATEGORY` as parameter.
2. System displays all the task under the `CATEGORY`.

Use case ends.

Extensions

1a. User does not supply `CATEGORY`.
    1a1. System displays all the tasks.
    Use case ends.
2a. The category does not exist in the system.
    2a1. System indicates the error.
    Use case ends.

Use case: Undo Command

MSS

1. User types in the undo command.
2. System tries to find the last operation that caused a change of data.
3. System undoes the operation.
4. System indicates the change to user.
   Use case ends.

Extensions

2a. The last operation which involve the change of the data does not exist
    2a1. System indicates the error.
    Use case ends.

Use case: Clear Command

MSS

1. User types in the command.
2. System deletes all the tasks.
   Use case ends.

Use case: Help Command

MSS

1. User types in the command.
2. System finds the details of a command with its parameters.
3. System displays the details.
   Use case ends.

Extensions

1a. `help` command is followed by the wrong parameters.
   1a1. System indicates the error and displays the correct format for the user. Use case ends.

1b. `help` command is followed by no parameter.
   1b1. System open the help windows
   Use case ends.

Use case: View a task

MSS

1. User types in the view command.
2. System retrieves the task list based on the index parameter in the recent displayed list.
3. System displays the detail of the task.
   Use case ends.

Extensions

1a. `view` command is followed by the wrong parameters
    1a1. System indicates the error
    Use case ends
2b. The index is not valid.
    2b1. System indicates the errors to user.
    Use cases ends.

Use case: Find keywords

MSS

1. User requests to find keywords.
2. System shows the tasks with requested keywords.
   Use case ends.

Extensions

1a. User doesn't supply keywords
    1a1. System indicates the errors to use
    Use case ends.

Use case: Task Due Command

MSS

1. User requests to find all tasks due by end date.
2. System parse the `DATE` to standard form
3. System List shows all of the tasks due by end date.
   Use case ends.

Extensions

1a. `taskdue` command is followed by the wrong parameters
  1a1. System indicates the error
  Use case ends.
2a. System is able to parse the supplied `DUE` date to standard format
  2a1. Use case resumes from step 2
2b. System is not able to parse the supplied `DUE` date to standard format
  2b1. System indicates the error Use case ends.

Use case: Redo Command

MSS

1. User types the command.
2. System reverses the changes caused by the most recent undo.
   Use case ends.

Extensions

1a. No recent undo is recorded.
  1a1. System indicates the error and shows the error message. Use case ends.

Use case: Mark Command

MSS

1. User request to mark task of `INDEX` done
2. System find the task with `INDEX` number
3. System marked the task as done.
   Use case ends.

Extensions

1a. `mark` command is followed by the wrong parameters
  1a1. System indicates the error
  Use case ends
2a. System cannot find task with `INDEX` number.
  2a1. System shows an error message.
  Use case ends.

Use case: Unmark Command

MSS

1. User request to mark task of `INDEX` undone.
2. System find the task with `INDEX` number
3. System marked the task as undone.
   Use case ends.

Extensions

1a. `unmark` command is followed by the wrong parameters
  1a1. System indicates the error
  Use case ends
2a. The `INDEX` is invalid.
  2a1. System shows an error message.
  Use case ends.

Use case: Save Command

MSS

1. User request to change the location of saving file.
2. System changes the saving location
3. System indicates the changing is successful.
   Use case ends.

Extensions

1a. `saveto` command is followed by the wrong parameters
   1a1. System indicates the error
   Use case ends
2a. The saving path is invalid.
   2a1. System shows an error message.
   Use case ends.

Use case: Exit Command

MSS

1. User request to exit the programme
2. System terminated.

Appendix C: Non-Functional Requirements

1. The program should work on any mainstream OS as long as it has Java 1.8.0_60 or higher installed.
2. It should be able to hold up to 1000 tasks.
3. Automated unit tests and open source code for this program should be readily available.
4. Every operation executed should be logged to the log file.
5. The program should favour DOS style commands over Unix-style commands.
6. The product should not have dependencies on other packages.
7. The software can be launched, without installing, by clicking on the executable file.

Appendix D: Glossary

Mainstream OS

Windows, Linux, Unix and OS-X

Deadline

A time interval with the start day as the day the task created day and the end day represents the date of the deadline.

Done

The built-in category in the system which store all the tasks that are marked as `done`.

Appendix E: Product Survey

Review of TickTick:

Strengths:

- Desktop software is provided, so we can launch it quickly without using a browser.
- Task are automatically categorised to `Overdue` `Today` `Next 7 days` and `Complete`, users can quickly find what they need to do in a certain day.
- User can create their own categories for tasks and allocate tasks to different categories.
- Elegant GUI is provided; the UI is not wordy and icons are quite intuitively.

Weaknesses:

- Network connection is required. If there is no network connection, the software even cannot be opened.
- The `parser` for input text can only deal with simple command.
  - E.g. Adding the start time of event. If the command cannot be recognized, it will be automatically added as task title.

Review of WunderList

Strengths:

- Ease of usage is the biggest strength. A user can easily add multiple items just by entering his desired items.
- Apple Watch integration is a nice bonus for Apple Watch owners.
- Slick user interface that allows background customizations.

Weaknesses:

- The free version has very limited features. Users only get 25 assigns per shared to-do list and 10 background choices.
- A constant network connection is required. If there is no network connection, the software cannot be opened.
- Wunderlist lacks IFTTT integration compared to other to-do list applications.

Review of Trello

Strengths:

- Online/Cloud based program that allows it to be transferrable to other computers.
- Ease to add in notes and description into Trello cards.
- Customizable looks.

Weaknesses:

- It cannot link up with other calendar software like Google calendar, which makes it hard to keep track of tasks done.
- Limited file attachment size, a problem when it comes to uploading large media files like videos or high quality images.
- The free version is much more limited than the paid version, making certain customisation features difficult to accomplish.

Review of Google Calendar

Strengths:

- Adds different kind of colouring to the schedule.
- Undo addition or deletion of events.
- Create multiple calendar for different purposes.
- GUI is quite intuitive. The formatting is clear and it does not require guidelines.
- Able to use calendar in offline mode.

Weaknesses:

- Unable to view all deleted events or reminders.
- It does not have command-line inputs to modify the calendar; most operations require a user to click, which can be time-consuming.
- Only accessible via browsers; no desktop application available.