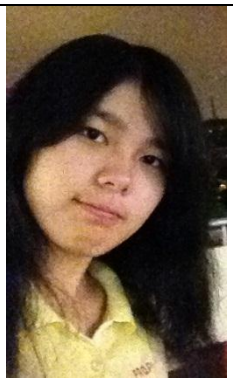
Project Manual

ToDo++

October 15, 2012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Credits

ToDo++

User Guide

For v0.1 software

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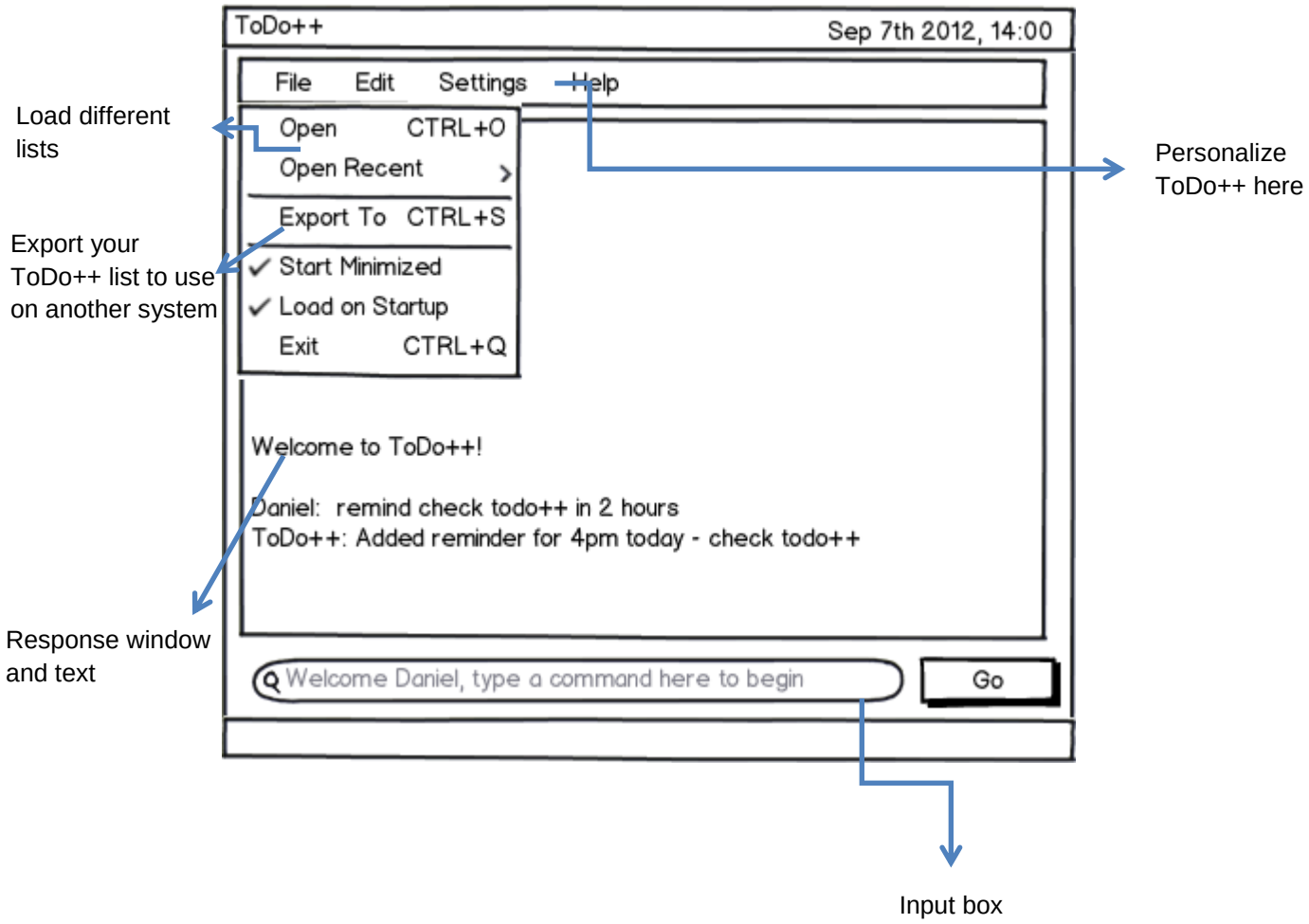
The Basics

Introduction

ToDo++ is the to-do application of your choice. Take control of your life like never before, with keyboard shortcut keys and intuitive natural-language-like text commands. Personalize the way you want to interact with the app. Be alerted of your events, and never lose track of your tasks again.

At a Glance



Quick Start

Upon launching ToDo++, you are presented with a minimalistic and intuitive screen. All you have to do to start creating your list is to just start typing!

- Create your first task/event by typing the keyword “add” followed by your task/event name into the input box, followed by the event time or deadline if any.
- For example, to add your Mom’s birthday brunch this Sunday, simply type in *“add mom’s bday this sunday”*. Hit *Enter* and the item is added!
- To view what you have added, just key in “display” and your list, ordered by date and time (or however you have customized it in the Settings page), will be displayed!

Note: If you have a task/event name that includes a date, time, or keyword, such as ‘Thank God It’s Friday' or 'delete ex-girlfriend’s number', use quotation mark or brackets around the task/event name to prevent ToDo++ from messing up your instruction.

You can search for, modify and delete your tasks from the list using these very words as the keywords. Alternative keywords can be found in the *Appendix*.

Remember the order of what you enter does not matter! Take a look at section *4.1. FlexiCommands* to find out more and learn how to customize ToDo++ to your needs.

The following sections will describe basic ToDo++ operations in more detail.

Creating Your ToDo++ List

Types of Tasks

There are three basic types of tasks you can add to your list.

Event tasks **:** items that have a start time (and possibly an end time).
Deadline tasks **:** items that have to be done before a specific time.
Floating tasks **:** items that have no timings attached to them.

As always, there is no fixed way to add a certain type of task. Simply type in what makes sense to you, and ToDo++ will know what type of task to add! See the next section, “Adding an Item” for more information.

Basic Operation

The order of input of all required fields is flexible. Date input is context sensitive. For more information, please see section *4.1. FlexiCommands*.

For a complete list of default keywords and more details on how to use bracketing, please see section *4.1.3 Using Reserved Keywords*.

You can quickly undo a wrongly input command using the “undo” command. For more information, please see section *4.2.1 Undoing a Command*.

The following sections detail the basic operations.

Adding a Task

Using the default add keyword, you can add all types of items to your list easily in a structured format similar to natural language. The task type will depend on the inclusion or omission of start/end times/deadlines. You can add your tasks in the following ways:

Adding a floating task	Enter “add [task name]” eg. add finish project
Adding an event (timed) task	Enter “add [task name] [start time] {end time} {day/date}“ eg. add check todo++ in 2 hours eg. add max birthday 4pm tomorrow eg. add team meting 2pm-4pm next wed
Adding a deadline item	Enter “add [task name] by [deadline]“ eg. add do cs2103 CE2 by saturday midnight

Note: Optional keywords are in curly braces. See Appendix for a full list of keywords and defaults.

Searching & Viewing

Using the default display keyword, you can search, filter and view your list of to-do items. ToDo++ has a powerful sort and search algorithm that will help you find your tasks with intuitive commands in consummate ease.

A search request may be made up of more than one search requirement. Below are examples of how you can use this feature to its full potential. Optional commands are in curly braces.

Display all tasks	Enter "display"
Search for and display all or some of the tasks scheduled on, before or, after a specific day or date	Enter "display [day/date]{before/after}{time}" eg. display 06/09/2012 eg. display Sunday after 1500hrs eg. display 6 sept before 10pm eg. display next Saturday eg. display tomorrow
Search for and display tasks by task names or descriptions	Enter "display [name]" eg. display buy milk

Note: Optional keywords are in curly braces. See Appendix for a full list of keywords and defaults.

Search results will be displayed in the feedback window as an indexed list. Each task will be given a numbered ID for easy reference. From here, you can do further operations, such as modifying or deleting an item. See the following sections for more information.

Updating & Modifying

Using the default modify keyword, you can easily modify and edit your task details. For example, you may wish to change the scheduled date for a task or rename it to correct a typographical error.

Note that in order to modify a task name, you must first call for the task by its name and then modify it by calling its reference index. The input should not contain any date/time input. Otherwise, it will be regarded as a request to modify the task's start/end times/deadlines.

Modifying task name	Enter "modify [task index] [new name]" eg, *(User)* modify milk *(ToDo++)* 1. milk Stevv for more info 2. buy more milk *(User)* modify 1 milk Steve for more info
Modifying task time	Enter "modify [task index] [new start time/deadline] {end time} {day/date} " eg. modify visit the vet Sunday eg, *(User)* modify buy car tomorrow *(ToDo++)* 1. buy toy car on sunday 2. buy car parking coupon today *(User)* modify 2 tomorrow

Note: Optional keywords are in curly braces. See Appendix for a full list of keywords and defaults.

Removing a Task

Using the default delete or -remove keyword, you can remove previously added tasks from your ToDo++ list. You can call for a task and delete it in the 2 following ways:

By task name Call the task by its name.

Note that if more than one task matches the input name, all matching tasks will be reflected in the feedback window. Each task will be given a numbered index for easy reference.

By task index Call the task by its given index, as displayed in the feedback window (as above).

Deleting a single task	Enter "delete/-remove [task name/index]" eg. delete 3 eg, *(User)* delete milk *(ToDo++)* 1. milk Steven for more info 2. buy more milk *(User)* delete 2
Deleting all or some of the tasks scheduled on, before or, after a specific day/date	Enter delete/-remove [day/date] {before/after} {time}" eg. delete today eg. -remove Sunday after 1500 hours eg. delete 31 december after 10pm

Note: Optional keywords are in curly braces. See Appendix for a full list of keywords and defaults.

Moving Your List

Loading & Saving Your ToDo++ List

By default, when ToDo++ is run for the first time, a new list is created and saved in default.todo.xml file, which can be located in the same directory. Subsequently, whenever ToDo++ is run, this file will be automatically loaded to retrieve the list in its latest state.

Note that manual saving is not required as the file is written to immediately after each command.

Exporting Your ToDo++ List

To export and save your list in a different format such as a .txt text file, or for Google Calendar, select File > Export To option in the menu bar.

Advanced Features

FlexiCommands

ToDo++ is an intelligent software that allows you to input commands in a way that is natural to you. Your input is therefore not case sensitive and not order specific. What this means is that the following commands are both equivalent and valid!

add max's birthday 25th oct	add 25/10 max's birthday
add movie outing 3pm to 5pm today	add 3pm-5pm movie outing today
display tomorrow after 7pm	display after 7pm tomorrow
delete after 4pm 6 december	remove 6/12 after 4pm

Custom Keywords

ToDo++ is a to-do list made to be familiar and intuitive to the individual user. We realize that you may not want to use the default keywords for your commands and have allowed for you to set custom keywords for the various basic operations. You can find this under Settings > Custom Keywords in the menu bar.

Using Reserved Keywords

There may be times when you wish to use a keyword within an event name. Simply enclose your event name within any of the following delimiters to do so.

- Quotation marks
    - add **"**add girl on facebook**"**
    - remove **'**delete error**'**
- Brackets/Braces
    - modify 2 **{**reserve dinner for 3**}**
    - add **(**go to 2am Bar**)** 2am tomorrow
    - display **[**21st birthday**]**

As shown above, the same goes for days, dates and times. For operations where indexing is possible (i.e. modify, delete), floating numbers should also be enclosed in delimiters.

Important Features for Power Users

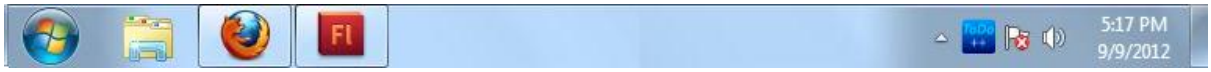
Undoing a Command

In order to undo a mistyped command, simply enter undo to revert to the state before the last entered command. Alternatively, you can also use the *ALT-Z* keyboard shortcut.

Minimizing to TaskBar

Simply enter hide to minimize the ToDO++ window to the system tray. You will stil be able to see its icon in the taskbar notification area while it runs in the background.

To restore the ToDO++ window, simply double-click on the icon or right-click and select *Restore*. Alternatively, you can use the *ALT-Q* keyboard shortcut to toggle between the minimized and restored states.



Icon minimized to notification area

Autorun

You can get ToDo++ to run automatically on Windows startup by simply checking the File > Load on Startup option in the menu bar. Additonally, you can also check File > Start Minimized if you wish for ToDo++ to start running in the minimized state.

Hotkeys

Keyboard shortcuts can be changed and customized under Settings > Hotkeys in the GUI menu ribbon. A list of default hotkeys can be found in the *Appendix*.

Appendix

Note: Optional keywords are in {curly braces}. Inputs in [square brackets] must be valid in order for the keywords to work.

COMMAND KEYWORDS

ADD: add, -new

SEARCH/VIEW: display, view, search

MODIFY: modify, -update

DELETE: delete, -remove

UNDO: undo

LOAD: -load

EXPORT: -export

MINIMIZE: -min

ADD FUNCTION KEYWORDS

DAY: mon, monday, tues, tuesday, wed, wednesday, thurs, thursday, fri, friday, sat, saturday, sun, sunday, today, tomorrow

MONTH: jan, feb, mar, apr, may, jun, jul, aug, sep, sept, oct, nov, dec, january, february, march, april, may, june, july, august, september, october, november, december

DATE: [1-31]{st/nd/rd/th}{MONTH} {valid year}

** date must be in the future to be valid*

TIME: [1-12] am/pm, [0000-2359] hrs/hours

** spaces are optional*

CONDITIONAL ADJECTIVES: [next/following] [DAY/MONTH]

SIGNIFY EVENT (TIMED) TASK: {from} [DATE/DAY/TIME] {– / to} {DATE/DAY/TIME}

** omission of time/month keyword for start time is valid as long as it is present in the end time (e.g. 2-4pm)*

SIGNIFY DEADLINE TASK: by [DATE/DAY/TIME]

ADD FUNCTION DEFAULT BEHAVIOR

- Not specifying any fields in date or time will cause the software to assume the most upcoming date which fits the entered fields. For example, “add event 2nd" will set the event to be on 2nd October if today’s date is 3rd September but 2nd September if today’s date is 1st September.

- The valid partial date inputs include inputs consisting of only the
  (1) day with suffixes i.e. 15th
  (2) day and month i.e. 15/10
  (3) month and year i.e. 10/2012 (requires full year input of YYYY)

- Not specifying the by keyword will create an event (timed) task instead of a deadline task if only one date/time is specified. The date/time specified will be the event’s start time.

- Omission of both time and month keyword when creating event task will cause ToDo++ to assume that the numbers refer to month by default.

SEARCH/VIEW FUNCTION KEYWORDS

DAY/MONTH/DATE/TIME: *same as ADD. see above*

DISPLAYING BY EVENT/DEADLINE TIMES: *same as ADD. see above.*

INDEX: all integer numbers are reserved if and only if the previous command caused indexed results to be displayed

SEARCH/VIEW FUNCTION DEFAULT BEHAVIOR

- All possible results will be displayed when keywords are omitted. For more specific results, try to enter a more specific search string.

- When searching by date or day, as long as the specified search date or day falls within the time window of an event task, the event task will also be displayed as a search result.

MODIFY FUNCTION KEYWORDS

DAY/MONTH/DATE/TIME: *same as ADD. see above*

MODIFYING EVENT/DEADLINE TIMES: *same as ADD. see above.*

INDEX: all integer numbers are reserved if and only if the previous command caused indexed results to be displayed

MODIFY FUNCTION DEFAULT BEHAVIOR

- When the modify operation is called with an input that includes a date/tday/time, it will be automatically considered to be a request for modification of the start/end times/deadline of the relevent task. If there is only one task found to match the input, its start/end times/deadline will thus be automatically modified. Otherwise, the modify operation functions like a search/view operation and returns a list of matching hits.

- In order to modify a task name, the task must be called by its index. Otherwise, the request will not be recognized.

DELETE FUNCTION KEYWORDS

DAY/MONTH/DATE/TIME: *same as ADD. see above*

INDEX: all integer numbers are reserved if and only if the previous command caused indexed results to be displayed

DELETE FUNCTION DEFAULT BEHAVIOR

- When more than one task in the list is found to match the input, the delete operation functions like a search/view operation and returns a list of matching hits.

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An Overview

Where We Are Now

Must-have Features

Most of the must-have features have been implemented and verified to be working in good order. The CRUD (create/add, read/display, update/modify, delete) tasks support is available and a simple search is also possible using the display command.

Extra Feature

The focus good-to-have feature FlexiCommand has been more or less fully implemented and may require additional refinement to ensure full working functionality and catch exceptions. A simple GUI has also been implemented such that keyboard shortcuts/hotkeys and user customization of command keywords and shortcuts are also available.

At a Glance

[Diagram]

General Class Descriptions

Attributes	
Variables	**Description**
enum CommandType	Enumerates the various command types (add, delete, display, sort, search, modify, undo, redo, invalid)
enum ContextType	Enumerates the various context types (starttime, endtime, deadline, current, next, following)
enum Month	Enumerates the 12 months, starting from index 1 (jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec)

Main Class	
Class	**Description**
Program (static)	The main entry point for the application

User Interface Classes	
Class	**Description**
UI	High-level class that handles all the user interaction and settings and keyboard shortcuts, displays feedback and calls on the other classes to handle the command processing
Menu	
ManagerSettings	

Logic Class	
Class	**Description**
Logic	High-level class that calls the other appropriate class methods to process and execute the commands as well as update the settings, where the user input is passed in and processed

Parser Classes	
Class	**Description**
CommandParser	Calls the parsing methods to make sense of the command string and create the relevant operation object
StringParser	The class that does most of the actual command parsing

Token Classes	
Class	**Description**
Token (abstract)	Stores TokenType enum, position
TokenCommand : Token	Inherits position Stores commandType (CommandType enum), taskIndex

TokenDate : Token	Inherits position Stores dateTime (System.DateTime struct), specific (boolean)
TokenTime : Token	Inherits position Stores time (System.TimeSpan struct)
TokenDay : Token	Inherits position Stores dayOfWeek (System.DayOfWeek enum)
TokenContext : Token	Inherits position Stores contextType (ContextType enum)
TokenIndex : Token	Inherits position Stores index (string)
TokenLiteral : Token	Inherits position Stores literal (string)

Storage Class	
Class	**Description**
Storage	Methods: **Storage**, AddTask, RemoveTask

Task Classes	
Class	**Description**
Task (abstract)	Stores taskname (public) Method: Task
TaskFloating : Task	Inherits taskname
TaskDeadline : Task	Inherits taskname Stores endtime (DateTime)
TaskEvent : Task	Inherits taskname Stores endtime (DateTime) and starttime (DateTime)

Operation Classes	
Class	**Description**
Operation (abstract)	An abstract class from which all the other Operation classes inherit from
OperationAdd : Operation	Stores newTask (Task object)
OperationDelete : Operation	Stores index
OperationDisplay : Operation	-
OperationSearch : Operation	Stores searchString (an empty string by default)
OperationModify : Operation	Stores oldTaskIndex and newTask (Task object)
OperationUndo : Operation	-
OperationHandler	Stores feedback strings Creates lastListedTask (list of Task objects), undoStack (stack of Operation objects and storageXML (Storage object)

	Methods: **OperationHandler**, **Execute**, Add, Delete, DisplayAll, TrackOperation

** not yet implemented*

User Interface Classes

UI

Provides the method for user customization of keyboard shortcuts
Handles all direction interaction with the user
Processes and handles all available user settings

Methods: PrepareSystemTray, PrepareSettingsManager, PrepareMenu, PrepareOutputBox, PrepareLogic, MinimiseMaximiseTray, RegisterInStartup, MinimiseToTrayWhenChecked, RegisterLoadOnStartupWhenChecked, ProcessText, *ProcessCmdKey*

Some testing has been done with regards to the testing user interaction (testing of hotkeys, keyboard shortcuts, user customized settings etc) with little overall system testing (testing of input and feedback etc).

Private Attributes	
Variables	**Description**
Hotkeys.GlobalHotKey ghk;	Global Hotkey to minimize to the system tray
SettingsManagers mainSettingsManager;	Instance of SettingsMangers that stores all settings data, including the user customized commands (FlexiCommands)
Logic logic;	Instance of Logic that handles the data structure and file operations; needed for use by text processing

Constructor	
UI();	Calls the PrepareSystemTray, PrepareSettingsManager, PrepareMenu, PrepareOutputBox and PrepareLogic methods, which loads the minization code, initial settings, menu strip and output box respectively

Private Methods	
Method	**Description**
void PrepareSystemTray();	Registers the hotkey (Alt+Q) to be used for minimizing/maximizing to/from System Tray
void PrepareSettingsManager();	Creates an Instance of Settings Manager
void PrepareMenu();	Prepares the menu bar by passing in an instance of SettingsManager and loading the relevant settings
void PrepareOutputBox();	Prepares the output box by passing in an instance of SettingsManager and loading the relevant settings
void PrepareSettingsManager();	Creates an Instance of Logic
void MinimizeMaximizeTray();	Minimize/Maximizes ToDo++ from system tray

void RegisterInStartup(bool isChecked);	Detects the user setting and determines if ToDo++ is to be open at startup or not

Protected Method

Method	Description
override bool ProcessCmdKey(ref Message msg, Keys keyData)	Processes the user customized keyboard shorcut to override the default/current keyboard shortcuts Takes note that ALT+Q is reserved for minimization

Logic Class

Provides the methods for processing and executing the commands
Provides the methods for calling the command parser to parse the commands and for calling the operation handler to execute the commands
Provides the method to update settings *

Methods: **ProcessCommand**, **UpdateSettings**, **ExecuteCommand**, ParseCommand

No testing has been done for the Logic class as yet.

Private Attributes	
Variables	**Description**
operationHandler operationHandler;	Instance of OperationHandler that executes the operations
List<Task> taskList;	List of tasks to record user data

Public Methods	
Method	**Description**
string ProcessCommand (string input);	High-level method that calls the ParseCommand and ExecuteCommand methods
bool UpdateSettings() *	
string ExecuteCommand (Operation operation);	Calls the operationHandler to execute the operation Returns feedback

Private Methods	
Method	**Description**
Operation ParseCommand (string command);	Calls an instance of CommandParser to parse the command Returns the derived operation

Parser Classes

CommandParser

Provides the method to parse the command string into tokens and then generate an operation object containing the relevant task object based on these tokens

Methods: **ParseOperation**, GenerateOperation, CreateOperation, CombineDateAndTime, GenerateNewTask, GetDateFromDay, GetDaysToAdd, WarnUsersOfMultipleCommands, GetPositionsOfDelimiters, RemoveBadIndexes, SortIndexes, CompareBasedOnZerothIndex

Black box testing has been employed in setting up test methods to test and validate ParseOperation method. The various following situations/cases have been tested: addition of valid deadline task, addition of invalid task, addition of valid timed event task with only one single specified start time, addition of valid timed event task with both start and end times specified.

Public Method

Method	Description
Operation ParseCommand (string input);	High-level method that first calls the GetPositionsOfDelimiters method, then an instance of StringParser to parse the string into tokens and finally, the GenerateOperation method

Private Methods

Method	Description
Operation GenerateOperation (List<Tokens> tokens);	Takes in a List of Tokens and generate an operation based on the tokens
Operation CreateOperation (CommandType commandType, …);	Create operation based on derived values and whether they have been used by creating the relevant Task and adding it to an instance of the relevant Operation class
DateTime? CombineDateAndTime (string taskName, …);	Returns a combined DateTime consisting of date and time inputs If only the time is defined, the DateTime returned is specified to be tomorrow If only the date is defined, the default DateTime constructed is returned
Task GenerateNewTask (string taskName, …);	Creates and returns the new relevant Task object based on the input startTime and endTime, which are optional
DateTime GetDateFromDay (…);	Takes in a day of the week and returns the corresponding date depending on what the preposition is
int GetDaysToAdd (…);	Calculates the number of days to add to the given day of the week in order to return the next occurrence of the desired day of the week.
int[] GetPositionsOfDelimiters	Combs the input string for all delimiters Returns the positions of all matching delimiters

(string input);	
void RemoveBadIndexes(ref List<int[]> indexOfDelimiters);	Checks each pair of indexes removes those that overlaps with the previous pair

StringParser

Provides the method for thorough command parsing and the generation of tokens, which are then subsequently used to create the actual task object in the CommandParser class
Provides the method for addition of user customized keywords

Stores CommandType enum, ContextType enum, Month enum, delimitingCharacters, commandKeywords Dictionary, contextKeywords Dictionary, dayKeywords Dictionary, monthKeywords Dictionary, timeSpecificKeywords Dictionary, timeGeneralKeywords Dictionary, timeSuffixes Dictionary and regexes (see Attributes)

Methods: **StringParser**, AddUserCommand, ResetCommandKeywords, FindPositionOfDelimiters, ParseStringIntoTokens, SplitStringIntoSubstrings, MergeCommandAndIndexKeywords, MergeDateAndTimeWords, MergeTimeWords, MergeWord_IfValidTime, MergeDateWords, MergeWord_IfValidAlphabeticDate, GenerateTokens, GenerateCommandTokens, GenerateDayTokens, GenerateDateTokens, GetDateMatch, GetMatchTagValues, ConvertMatchTagValuesToInts, ConvertToNumericMonth, RemoveSuffixesIfRequired, GenerateTimeTokens, GenerateContextTokens, GenerateLiteralTokens, AddLiteralToken, CompareByPosition, IsValidTime, IsValidNumericDate, IsValidAlphabeticDate, IsValidDate, GetTokenAtPosition

White box testing has been employed in setting up test methods to test and validate all date and time parsing methods (MergeDateWords, MergeWord_IfValidAlphabeticDate, GenerateDateTokens etc.), including the testing of all the date and time regexes.

Attributes	
Variables	**Description**
char[] delimitingCharacters	Specifies all delimiting characters ([,], (,), {, }, ‘, “)
Dictionary<string, CommandType> commandKeywords	Specifies the relevant strings to be the keys for various relevant CommandTypes i.e. add, delete etc.
Dictionary<string, ContextType> contextKeywords	Specifies the relevant strings to tbe keys for the various ContextTypes i.e. by, on, from etc.
Dictionary<string, DayOfWeek> dayKeywords	Specifies the relevant strings to tbe keys for the various DayOfWeeks i.e. mon, monday, tues, weekend etc.
Dictionary<string, Month> monthKeywords	Specifies the relevant strings to tbe keys for the various Months i.e. jan, january, feb, february etc.
Regex time_24HourFormat	Find all time inputs in the 24 hour format

Regex time_12HourFormat	Find all time inputs in the 12 hour format
Regex date_numericFormat	Find all date inputs in the numeric format i.e. DD/MM/YYYY, MM/DD/YYYY
Regex date_alphabeticFormat	Find all date inputs in the numeric format i.e. DD/MMM/YYYY, MMM/DD/YYYY
Regex date_daysWithSuffixes	Find all date inputs that only consist of days with suffixes

Constructor

StringParser();	Calls the InitializeDefautKeywords method (see below)

Initialization Methods

Method	Description
void InitializeDefaultKeywords ();	Calls all the other initialization methods
void InitializeCommandKeywords ();	Sets up the commandKeywords Dictionary
void InitializeDateTimeKeywords ();	Sets up the dayKeywords Dictionary Creates String Lists storing time specific keywords, time general keywords and time suffixes
void InitializeMonthKeywords ();	Sets up the monthKeywords Dictionary
void InitializeContextKeywords ();	Sets up the contextKeywords Dictionary

Internal Methods

Methods	Description
void AddUserCommand (string userCommand, CommandType commandType)	Adds a user defined/customized keyword to the list of defualt operation keywords
List<int[]> FindPositionsOfDelimiters (string input);	Searches the input string against the set delimiters' and return the positions of the delimiters as a list of integer pairs
List<Token> ParseStringIntoTokens (string input. List<int[]> = null);	Parses a string of words into a list of tokens, each containing a token representing the meaning of each word or substring By inputting a list of integer pairs to mark delimiting characters, multiple words can be taken as a single absolute substring (word).

Private Methods

Methods	Description
List<string> SplitStringIntoSubstrings (string input. List<int[]> indexOfDelimiters);	Splits a string and returns a list of substrings, each containing either a word delimited by a space, or a substring delimited by positions in the parameter indexOfDelimiters
List<string>	Checks to see if the command is followed by an

MergeCommandAndIndexKeywords (List<string> words);	index and if positive, merges the command with the index
List<string> MergeDateAndTimeKeywords (List<string> words);	Detects and merges all the date and time words into a single string while keeping the other words separate and unmerged by calling the MergeTimeWords and MergeDateWords methods i.e. input "add", "task", "friday", "5", "pm", "28", "sept", "2012" returns "add", "task", "friday", "5pm", "28 sept 2012"
bool MergeWord_IfValidTime (ref List<string> output, List<string> input, int position);	Checks if the indicated word in a list of string is part of a time phrase and if positive, merges it with the other words constituting the time phrase into one string
bool MergeWord_IfValidAlphabeticDate(ref List<string> output, List<string> input, int position, …);	Checks if the indicated word in a list of string is part of an alphabetic date phrase and if positive, merges it with the other words constituting the date phrase into one string
List<Token> GenerateTokens(List<string> input);	Searches an input list of strings and generates the relevant command, day, date, time, context and literal tokens of all the relevant matching strings by calling the various token generation methods GenerateCommandTokens, GenerateDayTokens, GenerateDateTokens, GenerateTimeTokens, GenerateContextTokens, GenerateLiteralTokens Returns a sorted list of the generated Tokens

Token Classes

Storage Class

Task Classes

x

Operation Classes

Operation

Abstract class

Subclasses OperationAdd, OperationDelete, OperationDisplay, OperationSearch, OperationModify, OperationUndo store the relevant class details

The various operation subclasses have been validated by the verification of the ParseOperation method as auxilliary storage objects used in the testing methods.

OperationAdd : Operation

Constructor	
OperationAdd(Task setTask);	Sets the new task to be setTask

OperationDelete : Operation

Constructor	
OperationDelete(int index);	Stores the index of the task to be deleted in index

OperationSearch : Operation

Constructor	
OperationSearch(string searchString);	Sets the search string to be searchString By default, the stored search string is an empty string

OperationModify : Operation

Constructor	
OperationModify(int Previous, Task Revised);	Stores the previous task index in oldTaskIndex and the new revised task in newTask

OperationHandler

Private Attributes	
Variables	**Description**
List<Task> lastListedTasks;	List of the most recent tasks for ready retrieval when required
Stack<Operation> undoStack;	Stack of Operation objects that store the latest executed operations for ready retrieval when user chooes to undo an operation
Stack<Operation>	Stack of Operation objects that store the undone operations for

redoStack;	ready retrieval when user chooes to redo an operation
Storage storageXML;	An instance of storage

Constructor

OperationHandler();	Creates a List of Tasks, Stack of Operations and an instance of Storage

Public Methods

Method	Description
string Execute(Operation operation, ref List<Task> taskList)	Processes command from UI Returns the feedback string