# Dr. Duke - User Guide

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# 1. Introduction

**Dr. Duke** is a GUI-based personal assistant for doctors to manage their patients' data.

It provides house officers with a streamlined notebook environment, which allows them to concentrate on quickly and accurately recording patient data in a standard format. If you're a house officer who types fast and don't mind learning how to use a keyboard-based application to type faster, then this application is for you!

# 2. Setting up

## 2.1. Prerequisites

- **JDK 11** or above (get the latest version of Java here)

## 2.2. Getting Started

1. Download the latest `.jar` release file from our release page.

2. Move the `.jar` file to the folder which you want to use as **Dr. Duke**'s home.

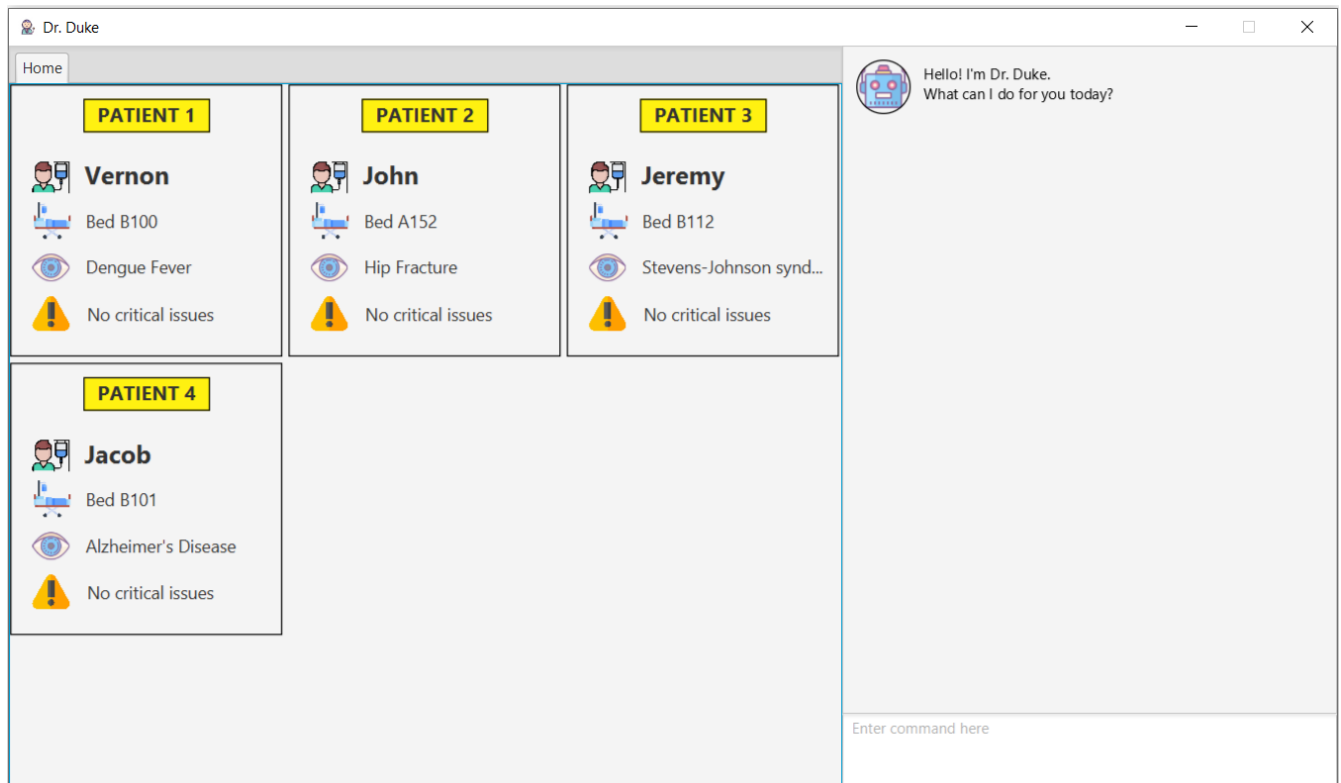3. Double click on the `.jar` file.

**Dr. Duke** should open shortly.



*Figure 1. UI*

# 3. Terminologies

- This app manages multiple `Patients`. Each Patient has one or more `Impressions` (diagnoses), and each Impression is supported by `Evidences` and treated by `Treatments`.

  - Evidences consist of `Observations` and `Results`

  - Treatments consist of `Plans`, `Investigations` and `Medicine`.

- The different screens you can view in the application are referred to as `Contexts`. Each context is associated with a particular set of data (e.g. the Patient context shows a detailed view of a particular Patient), and has its own set of commands.

- `priority` refers to how critical a Treatment or Evidence is. **0** means not urgent, excluding the item from the criticality system, **1** means critical. The other values are not defined specifically but the greater they are, the lower the priority. These lower priority levels are meant to remain flexible for the user to provide his desired level of fine-graining and task management.

  - `priority` **1** generally refers to something that needs to be followed up on or investigated immediately, e.g. signs of severe complications. `priority` **1** items will be displayed prominently to remind the house officer to respond to it when treating the patient.

- `status` refers to the stage of completion of a Treatment. `<status name>` refers to the textual description for each stage of completion.

# 4. Commands

Each command consists of a name, an argument, and some number of switches: settings for a command that modify its behavior. Switches can also have arguments.

For example, `discharge "John Doe" -sum "John Doe was discharged on 9 October 2019 at 3:54 pm".` represents the command `discharge` with the argument `"John Doe"`, modified by the switch `-sum` (meaning "summary"), which has the switch argument `"John Doe was discharged on 9 October 2019 at 3:54 pm."`.

Only a few characters have a special meaning when you are giving Dr. Duke commands. These are `\`, `-`, `<Space>`/`<Newline>`, and `<Enter>`:

- `\` → Escape character: the special character after a backslash loses its special meaning. To type a literal backslash, you need to escape the backslash: `Hello\\World` becomes `Hello\World`.
- `-` → Indicates the start of a switch. Must immediately be followed by an argument, if the switch requries one.
- `<Space>`/`<Newline>` → A switch is separated from its argument by a space or a newline.
- `<Enter>` → This sends a command to Dr. Duke. `<Shift-Enter>` would insert a new line.
- `Page Up` and `Page Down` → Access the input history.

The documentation below uses the following notation to describe the structure of the commands recognised:

- `<>` → input of the type specified
- `[]` → optional element of a command
- `(a | b | c)` → input that can be one of several possible options, in this case `a`, `b` or `c`
- `"<>"` → string, must be surrounded by quotes
- `[]*` → 0 or more copies of the contents of `[]`, separated by spaces

The following italicised words refer to specific repeated patterns:

- *patient_id* → (`<patient`s index in list> | "<search string>" | -b[ed] "<bed number>")`
- *string_or_idx* → (`<index> | "<search string>"`)
  - `<index>` refers to the index assigned to the object in the displayed list.
  - `<search string>` will be searched for in the names of all relevant objects.
- *type* → (`-m[edicine] | -in[v(x | estigation)] | -p[lan] | -o[bservation] | -r[esult]`)

Parsing rules:

- If a `"<search string>"` is given, the user will be presented with a page of search results that have names matching the search string, if the object to which it is referring is ambiguous. Refer to [the open command in the Home context](#) for a concrete example.
- Switches can be in any order.

- Switches with optional parts of their names can be recognised with any portion of the optional part. E.g. `-crit` matches `-c[ritical]`.

- If it is ambiguous whether an argument is for the command itself, or one of the switches, it will be presumed to belong to the switch.

# 4.1. Home

Displays up to **100** indexed panels of `Patients`. Each panel provides the user with a **summary** of the main details of a particular `Patient`. They are as follows.

1. Name

2. Bed number (key identifier of a `Patient`)

3. Primary diagnosis

4. Number of critical issues

## 4.1.1. `new` - Add a new Patient

Format: `new -n[ame] "<name>" -b[ed] "<bed number>" -a[llerg(y | ies)] "<allergies>" [<optional switch>]*`

Optional switches*:

- `-g[o]`

- `-h[eight] <height>` (expressed in cm)

- `-w[eight] <weight>` (expressed in kg)

- `-ag[e] <age>`

- `-num[ber] <number>`

- `-ad[dress] "<address>"`

- `-hi[story] "<history>"`

The patient's name, bed number and allergies must be specified. Allergies should be expressed in comma-separated values (CSV) format. The other optional fields are set to undefined values by default. The `-g[o]` switch opens the patient's context for the newly added patient.

**Example**

> new "John Doe" **-b** "A103" **-a** "paracetamol" **-h** 175 **-w** 60 **-ag** 35 **-hi** "Heart attack 3 years ago"

## 4.1.2. `open` - Go to a more detailed view of a particular Patient

Format: `open patient_id [-im[pression]]`

If opening by search string, patients will be searched through by name, and results presented and selected as per the `find` command. For example, if I have two patients named "John" and "Joe", `open`

`jo` will open a search result context with the two patients.

If the optional `-im[pression]` switch is provided, access the [primary diagnosis](#) for that particular Patient.

**Example**

```
open 1 -impress (open by index and go to primary impression)
open -b "C210" (open by bed number)
open Duke (open by search string)
```

### 4.1.3. `find`

Format: `find ["<search string>"] [type]`

Display a list of all Impressions, Treatments and Evidence matching the criteria specified in the search. If none of the `type` switches are used, all types of objects will be listed. If at least one of them is listed, only objects whose type is used as a switch will be listed.

**Example**

```
find aspirin -p
```

### 4.1.4. `discharge` - Generate a discharge report for the patient and delete him/her from the system

Format: `discharge patient_id [-sum[mary]] "<discharge summary>"]`

The discharge report contains all of the information being tracked regarding the Patient. An optional discharge summary may be specified in the command to add additional information. In **v2.0**, they will be [archived](#).

**Example**

```
discharge 5 -summary "Patient will return again at 02/11/2019 for final consultation"
```

### 4.1.5. `undo` - Undo the previous command [v2.0]

Format: `undo <number of commands>`

*Available in:* [Section 4.1, "Home"](#), [Section 4.2, "Patient"](#), [Section 4.3, "Impression"](#), [Treatment and Evidence]

You may undo up to the last 10 commands. Only commands that affect the state of the system count against this limit (e.g. adding new Patients or editing data, not navigating across contexts).

### 4.1.6. `redo` - Redo a command that has been undone [v2.0]

Format: `redo <number of commands>`

*Available in:* Section 4.1, "Home", Section 4.2, "Patient", Section 4.3, "Impression", [Treatment and Evidence]

After an `undo` command is executed, any commands (other than `undo` or `redo`) sent will clear the `redo` stack. The undone commands cannot be redone from that point onwards.

### 4.1.7. `critical` - Display all critical observations and plans of all patients [v2.0]

Format: `critical`

### 4.1.8. `archive` - Display all discharged patients [v2.0]

Format: `archive`

# 4.2. Patient

Shows a detailed view of a `Patient`. The details are displayed in separate panels as follows.

- Personal details such as name, age, height, weight, etc.
- List of allergies
- Medical history
- List of `Impressions` with their associated details (the name, an excerpt of its description, and the number of critical items and follow-up investigations associated with it)
- List of critical Treatments and Evidences (of priority 1)
- List of `Investigations` to follow up on (i.e. all current investigations; completed investigations should be stored as `Results`)

Inherits: `help`, `undo`, `redo`

### 4.2.1. `new` - Add a new Impression for this Patient

Format: `new -n[ame] "<name>" -desc[ription] "<description>" [-g[o]]`

Opens the new Impression's context if `-g[o]` is specified.

**Example**

```
new "Dengue Fever" -desc "High fever and back pain" -g
```

### 4.2.2. open - Open a critical (Treatment / Evidence) or Investigation item listed on the page, or an Impression

Format: open ("<search string>" | string_or_idx -c[ritical] | string_or_idx -i[nv(x|estigation)] | string_or_idx -im[pression])

If a *<search string>* is used, the first result that matches the search string will be immediately accessed.

**Example**

```
open 3 -im
open "Fever"
```

### 4.2.3. edit - Edit one of the details of the Patient

Format: edit <switch> [<new value>] [<switch> [<new value>]]* [-app[end]]
Example: edit -height 180 -weight 60 -history "memes" -app

For string-valued fields, -app will append the field's <new value> to its current value.

Switches and corresponding new value format:

- -h[eight] <height>
- -w[eight] <weight>
- -ag[e] <age>
- -num[ber] <number>
- -ad[dress] "<address>"
- -hi[story] "<history>"
- -a[llerg(y | ies)] "<allergies>"

In [**v2.0**], if a <new value> is not supplied, a text box with the current value loaded inside will be displayed for the user to edit.

### 4.2.4. delete - Delete a critical (Treatment / Evidence) or Investigation item listed on the page, or an Impression

Format: delete ("<search string>" | string_or_idx -c[ritical] | string_or_idx -i[nv(x|estigation)] | string_or_idx -im[pression])

If a <search string> is used, the first result that matches the search string will be immediately accessed.

### 4.2.5. `history` - Append miscellaneous notes to a patient's medical history

Format: `history <additional notes>`

**Example**

```
history ggwp
```

Functionally the same as `history` in the Home context.

### 4.2.6. `primary` - Set a particular Impression as the primary diagnosis for the Patient

Format: `primary string_or_idx`

**Example**

```
primary 1
```

### 4.2.7. `find` - Find items matching certain criteria

Format: `find ["<search string>"] [type]`

Display a list of all Impressions, Treatments and Evidence matching the criteria specified in the search. If none of the `type` switches are used, all types of objects will be listed. If at least one of them is listed, only objects whose type is used as a switch will be listed.

**Example**

```
Example: find aspirin -im
```

### 4.2.8. `discharge` - Generate a discharge report for the Patient and delete him/her from the system

Format: `discharge [-sum[mary] <discharge summary>]`

Functionally the same as `discharge` in the Home context.

### 4.2.9. `report` - Generate a text file containing all data on this patient

Format: `report`

A report will be generated in the format required by the hospital's internal systems. In [**v2.0**], the hospital's required format can be specified.

*Available in:* Section 4.2, "Patient", Section 4.3, "Impression", [Treatment and Evidence]

### 4.2.10. `back` - Go back to the previous context

Format: `back`

*Available in:* Section 4.2, "Patient", Section 4.3, "Impression", [Treatment and Evidence]

This will go back to the immediate context that the user came from. A context stack will be maintained.

### 4.2.11. `up` - Go up to the next-higher context

Format: `up`

*Available in:* Section 4.2, "Patient", Section 4.3, "Impression", [Treatment and Evidence]

This will go to the context hierarchically above the user's context. In the Patient context, it will go back to Home context. In the Impression context, it will go back to the Patient context associated with it.

### 4.2.12. `round` - Ward round mode [v2.0]

Format: `round`

*Available in:* Section 4.2, "Patient", Section 4.3, "Impression", [Treatment and Evidence] [v2.0]

An input mode designed for maximum speed input. Only the first word of the input, which should be a sequence of control characters, will determine where the input is directed. Everything else will be treated as input.

## 4.3. Impression

Shows a detailed view of an Impression, displaying in separate panels:

- The name and full description of the Impression
- A list of Evidence for the Impression, sorted by default with critical items first
- A list of Treatments for the Impression, sorted by default with critical items first, followed by investigations that require follow-up
- A small panel with the patient's allergies

Inherits: `help`, `back`, `up`, `report`, `undo`, `redo`

### 4.3.1. `new` - Add a new Treatment or Evidence item to this Impression

Format: `new` `type` `<relevant switches>` `[-g[o]]`

Open the new Treatment or Evidence item's context if `-g[o]` is specified. Relevant switches for various types are as follows.

| Type | Relevant Switches |
|---|---|
| `-m[edicine]` | • `-n[ame] "<name>"` - Required<br>• `-sta[tus] ("<status name>"|<status idx>)` - Default: 0 (not ordered)<br>• `-d[ose] "<dose>"` - Required<br>• `-da[te] "<start date>"` - Default: Today<br>• `-du[ration] "<duration of course>"` - Required<br>• `-pri[ority] <priority idx>` - Default: 0 (not urgent) |
| `-i[nv(x|estigation)]` | • `-n[ame] "<name>"` - Required<br>• `-sta[tus] ("<status name>"|<status idx>)` - Default: 0 (not ordered)<br>• `-sum[mary] "<summary>"` - Default: ""<br>• `-pri[ority] <priority idx>` - Default: 0 (not urgent) |
| `-p[lan]` | • `-n[ame] "<name>"` - Required<br>• `-sta[tus] ("<status name>"|<status idx>)` - Default: 0 (not ordered)<br>• `-sum[mary] "<summary>"` - Default: ""<br>• `-pri[ority] <priority idx>` - Default: 0 (not urgent) |
| `-o[bservation]` | • `-n[ame] "<name>"` - Required<br>• `-sum[mary] "<summary>"` - Default: ""<br>• `-(subj[ective]|obj[ective])` - Default: objective observations<br>• `-pri[ority] <priority idx>` - Default: 0 (not urgent) |
| `-r[esult]` | • `-n[ame] "<name>"` - Required<br>• `-sum[mary] "<summary>"` - Default: ""<br>• `-pri[ority] <priority idx>` - Default: 0 (not urgent) |

`<status name>` is a case-insensitive substring of the `statusArr` entry of that particular object, while `<status idx>` is its numerical representation.

### 4.3.2. `open` - Open a Treatment or Evidence item listed on this page

Format: `open ("<search string>" | -e[vidence] string_or_idx | -t[reatment] string_or_idx)`

This will open a new context for the specific Treatment or Evidence identified.

### 4.3.3. `edit` - Edit one of the details of the Impression, or one of its Treatment or Evidence items

Format: `edit [-app[end]] ("<search string>" | -e[vidence] string_or_idx | -t[reatment] string_or_idx | -im[pression] ) <switch> [<new value>] [<switch> [<new value>]]`

If input with the `-im[pression]` switch set, it edits the `Impression` itself. The switches and corresponding new value formats are as follows:

- `-n[ame] "<name>"`
- `-desc[ription] "<description>"`

Otherwise, it edits the treatment or evidence specified. The possible values for `<switch>` and `<new value>` can be found in the associated table for `new`.

### 4.3.4. `delete` - Delete a Treatment or Evidence item listed on this page

Format: `delete ("<search string>" | -e[vidence] string_or_idx | -t[reatment] string_or_idx )`

### 4.3.5. `primary` - Set this Impression as the primary Impression for the Patient

Format: `primary`

### 4.3.6. `move` - Move a Treatment or Evidence to a different Impression

Format: `move ("<search string>" | -e[vidence] string_or_idx | -t[reatment] string_or_idx) [ -im[pression] string_or_idx]`

If a Treatment or Evidence is assigned incorrectly, it can be moved to a different Impression via this command. If the `-im[pression]` switch is not used to specify the Impression to move it to, a window listing all Impressions will appear, and the user can select the correct Impression using its list index [**v1.4**].

### 4.3.7. `priority` - Mark a Treatment or Evidence as a certain priority level

Format: `priority ("<search string>" | -e[vidence] string_or_idx | -t[reatment] string_or_idx) -s <new priority>`

`<new priority>` must be a non-negative integer.

### 4.3.8. `status` - Update the completion status of a Treatment

Format: `status string_or_idx [-s ("<status name>" | <status idx>)]`

If `-s` is not specified, `status` will be incremented by 1, unless it is at the maximum value.

### 4.3.9. `result` - Convert an Investigation that has been completed into a Result

Format: `result string_or_idx -sum[mary] "<result summary>"`

*idx* in this scope will refer to an index in the Treatment list. The result summary will be appended to the Investigation summary.

### 4.3.10. `find` - Find items matching certain criteria

Format: `find ["<search string>"] [type]`
Example: `find aspirin -t`

Display a list of all Impressions, Treatments and Evidence matching the criteria specified in the search. If none of the `type` switches are used, all types of objects will be listed. If at least one of them is listed, only objects whose type is used as a switch will be listed.

# 4.4. Treatment and Evidence [v1.4]

All Treatment and Evidence contexts (one for each type of Treatment and each type of Evidence) behave in essentially the same way: they display all their data in full. This section will list the commands that they have in common. Each individual Treatment and Evidence context is assumed to have all these commands, and all the commands in this inheritance list.

Inherits: `help`, `back`, `up`, `report`, `undo`, `redo`

### 4.4.1. `edit` - Edit one of the details of the Treatment or Evidence

Format: `edit [-app[end]] <switch> [<new value>] [<switch> [<new value>]]`

The possible values for `<switch>` and `<new value>` can now be found in the table for `new` in the Impression context.

### 4.4.2. `move` - Move a Treatment or Evidence to a different Impression

Format: `move [-im[pression] "<search string>"]`

If a Treatment or Evidence is assigned incorrectly, it can be moved to a different Impression via this command. If the `-im[pression]` switch is not used to specify the Impression to move it to, a window listing all Impressions will appear, and the user can select the correct Impression using its list index.

### 4.4.3. `priority` - Mark the Treatment or Evidence as a certain priority level

Format: `priority <new priority>`

`<new priority>` must be a non-negative integer.

## 4.5. Treatment [v1.4]

Contains everything in [Treatment and Evidence].

### 4.5.1. `status` - Update the completion status of a Treatment

Format: `status [("<status name>" | <status idx>)]`

If no `<status name>` or `<status idx>` is specified, `status` will be incremented by 1, unless it is at the maximum value.

## 4.6. Investigation [v1.4]

Contains everything in [Treatment and Evidence].

### 4.6.1. `result` - Convert the Investigation into a Result after completion

Format: `result -sum[mary] "<result summary>"`

The result summary will be appended to the Investigation summary.

# 5. Command Summary

## 5.1. Command Summary

Summary of all the commands available in each context, for a more detailed description and associated switches, refer to section 1.

| Command | Description |
|---|---|
| help $_{1/2/3/4}$ | Display a context-specific list of commands and options |
| critical $_1$ | Display all critical observations and plans of all Patients |
| discharge $_{1/2}$ | Generate a discharge report for the Patient and delete him from the system |
| archive $_1$ | Display discharged Patients |
| open $_{1/2/3}$ | Go to a more detailed view of a particular Patient / Open a critical or Investigation item listed on the page, or an Impression / Open a Treatment or Evidence item listed on this page |
| new $_{1/2/3}$ | Add a new Patient to the system / Add a new Impression to this Patient / Add a new Treatment or Evidence item to this Impression |
| history $_{1/2}$ | Add miscellaneous notes to a patient's history / Add miscellaneous notes to a patient's history |
| undo $_{1/2/3/4}$ | Undo the previous command |
| redo $_{1/2/3/4}$ | Redo a command that has been undone |
| back $_{1/2/3/4}$ | Go back to previous context |
| up $_{1/2/3/4}$ | Go up to next-higher context |
| edit $_{2/3/4}$ | Edit one of the details of the Patient / Edit one of the details of the Impression / Edit one of the details of the Treatment or Evidence |
| delete $_{2/3}$ | Delete a critical or Investigation item listed on the page, or an Impression / Delete a Treatment or Evidence item listed on this page |
| primary $_{2/3}$ | Set a particular Impression as the primary Impression for the Patient / Set this Impression as the primary Impression for the Patient |
| find $_{2/3}$ | Find items matching certain criteria / Find items matching certain criteria |
| report $_{2/3/4}$ | Generate a text file containing all data on this patient / Generate a text file containing all data on this patient |
| round $_2$ | Ward round mode |
| move $_{3/4}$ | Move a Treatment or Evidence to a different Impression / Move a Treatment or Evidence to a different Impression |
| priority $_{3/4}$ | Mark a Treatment or Evidence as a certain priority level / Mark the Treatment or Evidence as a certain priority level |
| status $_{3/5}$ | Update the completion status of a Treatment / Update the completion status of a Treatment |
| result $_{3/6}$ | Convert an Investigation that has been completed into a Result / Convert the Investigation into a Result after completion |

*1: Home, 2: Patient, 3: Impression, 4: Treatment or Evidence, 5: Treatment , 6: Investigation*

*Figure 2. Command summary*

# 5.2. Switch Summary

Summary of all the switches available for the diffrent commands. For a more detailed description on how to use the switches with the diffrent commands, refer to section 1.

| Switch | Description |
| --- | --- |
| -im | Display/edit primary impression for a patient |
| -g | Opens a patient's context |
| -h <height> | Add/Edit a patient's height |
| -w <weight> | Add/Edit a patient's weight |
| -ag <age> | Add/Edit a patient's age |
| -num <number> | Add/Edit a patient's number |
| -ad "<address>" | Add/Edit a patient's address |
| -hi "<history>" | Add/Edit a patient's history |
| -n"<name>" | Add/Edit name (e.g. to a patient) |
| -b <bed number> | Add/Edit patient's bed number |
| -a "<allergies>" | Add/Edit patient's allergies |
| -d "<description>" | Add/Edit patient's description |
| -sta ("<status name>"\|<status idx>) | Add/Edit patient's status |
| -d "<dose>" | Specify a dose for a specific medicine to a specific patient |
| -da "<start date>" | Specify the start date of a medication |
| -du "<duration of course>" | Specify the length of a medication |
| -pri <priority idx> | Specify a patient's priority (e.g. for a specific medicine ) |
| -sum "<summary>" | Add a summary (e.g. to an investigation) |
| -(sub \|obj) | Specify if an observation is objective or subjective |

*Figure 3. Switch summary*

# 6. FAQ

**Q**: How can I continue working with the same data on a different computer?
**A**: Install this application on the other computer. All of your **Dr. Duke** data is stored persistently in the `data` folder, and can be transferred without any configuration to the `data` folder of the new installation.