Bertrand Tan - Project Portfolio

Project: PalPay

Overview

This portfolio documents my contributions to PalPay, a software engineering project under the module, CS2103T Software Engineering. My Team and I were tasked to morph an existing software application into a functional desktop application, written in Java, to better suit our intended target issues and audiences.

PalPay is a financial tracking application activated through a Command-Line-Interface (CLI). Our intended target audience being computing students who lack a centralized platform for financial management and planning.

For the project, my main role was to develop the *Transaction* feature. This feature represents the fundamental user logging and tracking capabilities that other features of this application subsequently depends on.

Summary of contributions

- **Code contributed**: RepoSense
- **Major enhancement**: Implemented the `Transactions` tab and the features subsumed under it.
  - What it does: Allows users to input and log their expenditure and income statements. PalPay will also display an overall transaction balance to give users an overall sensing of their financial habits.
  - Justification: This feature fulfills the primary goal of the application which is to provide users a platform to store and log all their financial statements in a fast and intuitive manner.
  - Highlights: This feature requires constant integration with all existing major features of PalPay (i.e. `out` Transaction to affect `budget` if certain conditions are met). This requires constant cross-examination with other features and reimplementation of the codebase to ensure optimal functionality. This also requires a broad familiarity with the entire code base at all points during the development phase.
- **Minor enhancement**:
  - Implemented and handled code base throughout for Update feature and `UpdateTransactionDescriptor` to function with all different major features.
  - Handled parser checks for the `Amount` variable for incorrect or potentially program-breaking cases. (i.e. Maximum parsed amount can only contain a value of 999,999)
- **Other contributions**:
  - Project management:

        - Managed issue tracker of the group's repository
        - Handled external team bug catches. (Issues : #176, #166, #151, #145, #132, #109)
        - Reviewed and merged pull requests. (Pull requests: #251, #234, #147, #122, #101, #79)
    - Enhancements to existing features:
        - Comprehensive Unit and Integration Tests (Pull requests: #211, #99)
        - Refactored `Name` model object to `Description` model object (Pull requests: #111)
        - Implemented and integrated `Update` class (Pull requests: #211, #108, #101)
    - Documentation:
        - Reformatted the User Guide for a more sequential flow.
        - Wrote the details for the following commands in the User Guide.
            - In
            - Out
            - Update
            - Delete
        - Created UML diagrams to help in the explanation of `in / out`, `update` and `delete` commands in the Developer Guide.
        - Included **Aspect** cases under **Design Considerations** in the Developer Guide.
    - Community:
        - Reported bugs and suggestions for other teams in the module. (Examples: T13-1 #223, T13-1 #222, T13-1 #221, T13-1 #220, T13-1 #219, T13-1 #216)

Contributions to the User Guide

Given below are snippets of sections I contributed to the User Guide. They showcase my ability to write documentation targeting end-users.

Logging Expense : `out`

Have you recently made an expenditure that requires logging down? PalPay accepts all expenditure inputs through the `out` command. Inputting an `out` command will decrease the overall balance value. Your expenditure statements, just like the income statements, have the added option to be tagged under one or more categories. You can do so by including the `[c/CATEGORY]` parameter in your command line. All uncategorized incomes will be tagged under the `GENERAL` category.

Command Syntax

Format: `out $/AMOUNT n/DESCRIPTION d/DATE [c/CATEGORY]…`

- Users should not input negative values into `AMOUNT` (i.e. `out $/-100 ⋯`) as PalPay has already accounted for the difference between incomes and expenditures.
- `CATEGORY` accepts the categories for this expenditure. An `out` Transaction can be created without any `CATEGORY`.
- `out` updates the user’s overall balance with a net **negative** amount (e.g. `out n/milk $/2 d/10102019` will **decrease** overall balance by $2)

Important Details

- Note that `out` *Transactions* differ from `in` *Transactions* in the display amount. The `in` entries are characterized by the **positive** value within their display box whilst the `out` entries are characterized by the **negative** values in their display box. The difference can be observed in the example usage below.
- An `out` command will affect the remaining amount of `Budget` entries with similar categories within the same time period (Refer to Example 3).

Example Usages

Example 3

```
out $/100 n/pants d/02012020 c/clothes
```

1. Expenditure logging
   - Inputs an expenditure of "$100" with description set to "pants" and date set on "02/01/2020".
   - The income includes "clothes" under the `CATEGORY` field.

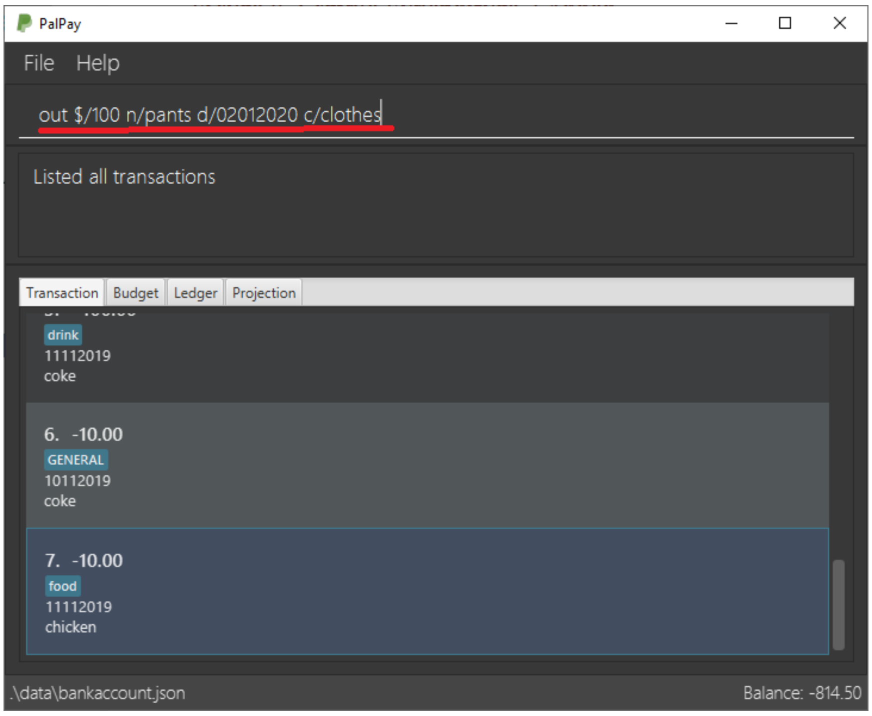
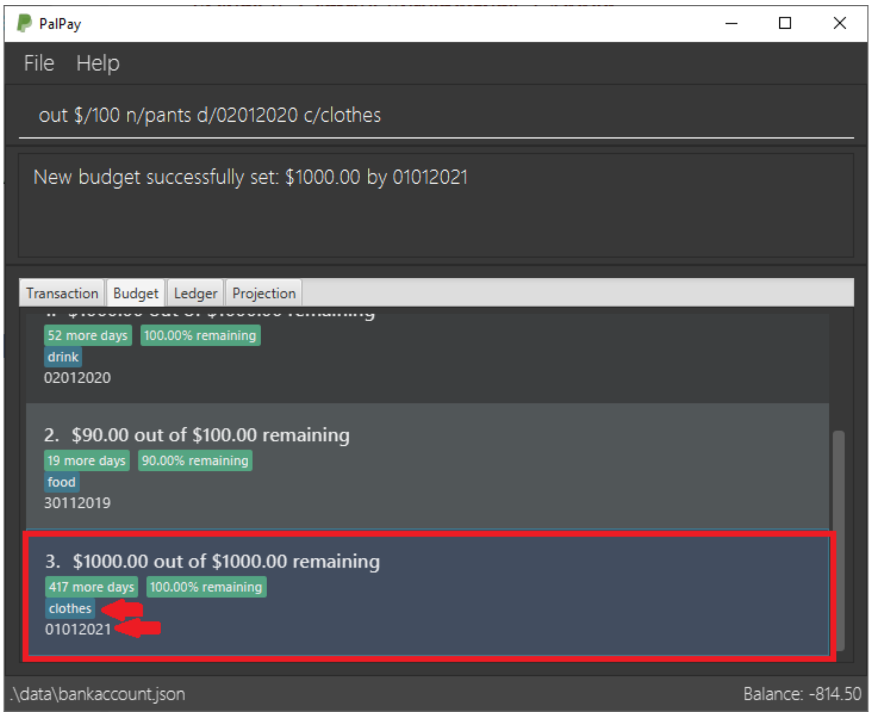

PalPay
File Help
out $/100 n/pants d/02012020 c/clothes
Listed all transactions
Transaction Budget Ledger Projection
drink
11112019
coke
6. -10.00
GENERAL
10112019
coke
7. -10.00
food
11112019
chicken
.\data\bankaccount.json Balance: -814.50

Figure 1. Expenditure Logging Example 3

2. Budget with similar categories and time period.
   - Entry 3 of the *Budget* tab has `clothes` under its `CATEGORY` field.
   - Entry 3 of the *Budget* tab has a deadline set to "01/01/2021".



```
out $/100 n/pants d/02012020 c/clothes
```

New budget successfully set: $1000.00 by 01012021

52 more days 100.00% remaining
drink
02012020

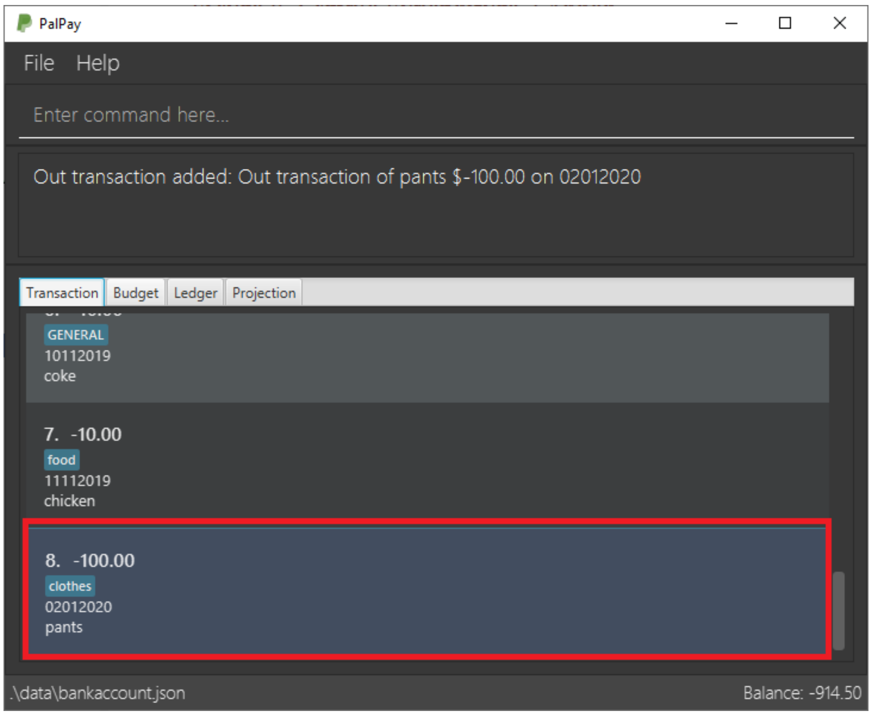
2. $90.00 out of $100.00 remaining
19 more days 90.00% remaining
food
30112019

3. $1000.00 out of $1000.00 remaining
417 more days 100.00% remaining
clothes
01012021

.\data\bankaccount.json Balance: -814.50

Figure 2. Budget with 'clothes' category

3. Expenditure added
   - The expenditure is added to the bottom of the *Transaction* tab.
   - The added expenditure has a date set to `02/01/2020`.
   - The added expenditure is tagged under the `clothes` category.



Out transaction added: Out transaction of pants $-100.00 on 02012020

GENERAL
10112019
coke

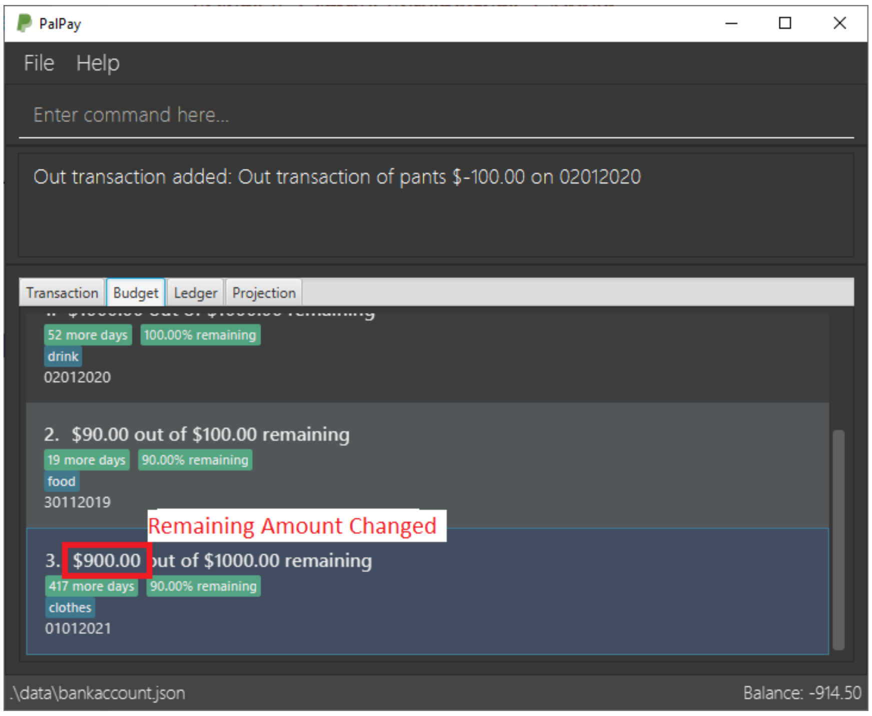
7. -10.00
food
11112019
chicken

8. -100.00
clothes
02012020
pants

.\data\bankaccount.json Balance: -914.50

Figure 3. Sample Expenditure 3 Added

4. Budget entry updated
    - The remaining amount of entry 3 of the *Budget* tab has decreased from "$1000" to "$900".



Out transaction added: Out transaction of pants $-100.00 on 02012020

52 more days 100.00% remaining
drink
02012020

2. $90.00 out of $100.00 remaining
19 more days 90.00% remaining
food
30112019

3. $900.00 out of $1000.00 remaining
417 more days 90.00% remaining
clothes
01012021

.\data\bankaccount.json Balance: -914.50

Figure 4. Budget entry updated

Example Commands:

- `out $/100 d/01012019 n/milk c/food c/drinks`
- `out $/29 d/29022020 n/taxi c/transport`
- `out $/12 d/31122019 n/burger`

Updating Finance : `update`

Did you make a mistake in one of your entries? Perhaps you over counted that expenditure you made. PalPay provides you with an `update` feature which helps you change specific fields within your entries.

Command Syntax

The `update` feature has different implementations for different entry types. The conditions for the `update` feature is as follows.

Format (Transactions): `update TYPE+INDEX [$/AMOUNT] [d/DATE] [n/ITEM] [c/CATEGORY]…`

Format (Budget): `update TYPE+INDEX [$/AMOUNT] [d/DATE] [c/CATEGORY]…`

Format (Ledger): Cannot be updated

Format (Projections): Cannot be updated

- At least one `AMOUNT`, `DATE`, `ITEM` or `CATEGORY` fields must be entered. You can input more than 1 of the mentioned fields (e.g. `update t1 $/100 n/milk`).
- `TYPE` only accepts either `t` (*Transaction*) or `b` (*Budget*). (e.g. `update t1 ..` refers to updating a *Transaction* of index 1).
- `TYPE+INDEX` requires the TYPE and INDEX to be placed in sequential order (e.g. `update b 1 ..` or `update 1 ..` or `update 1b ..` will not work).
- Example: `update t1 $/3000 d/10102019` will update the first transaction from the list of transactions by changing it's `AMOUNT` to "$1000" and `DATE` to "10/10/2019".

Important Details

- `update` requires at least one field to be updated. (e.g. `update t1 $/20 d/10102019 n/milk` and `update t1 $/10` will both be accepted).
- You can only update an existing transaction, budget or projection. Nothing will be updated if the entry of "index" `INDEX` does not exists.
- `Ledger` and `Projection` do not have an update function. If you need to change specific fields within a ledger or projection entry, you should delete the target entry and recreate a new entry with your desired fields.
- You cannot change an `in` *Transaction* to an `out` *Transaction* or vice versa.
- Changing an expenditure's (`out` *Transaction*) category field to that of a Budget's entry will reflect changes on that particular Budget entry as well. (Further explained in **Example 3** below).

NOTE Changing the **categories** of an `out` *Transaction* entry with similar categories to that of a *Budget* entry will reflect changes on the budget's remaining amount in version 2.0.

Example Commands:

- `update t1 $/20 n/coke c/drinks d/12122019`
- `update b2 $/300`
- `update t4 $/30 d/12102019`

Contributions to the Developer Guide

Given below are snippets of sections I contributed to the Developer Guide. They showcase my ability to write technical documentation and the technical depth of my contributions to the project.

Transaction: `in` / `out`

The `Transaction` abstract class allows user to input income and expense statements. Both `in` and `out` transactions requires the mandatory `Amount`, `Description` and `Date` fields to be appended. There is an optional `Category` field which can accept one or more input depending on the user specifications.

The `in` transactions will increase the `BankAccount` balance amount whilst the `out` transactions will reduce the `BankAccount` balance amount.

`In` Transactions represent the income statements inputted into Palpay.

`Out` Transactions represent the expenditure statements inputted into Palpay.

Current Implementation

The sequence diagram below illustrates how PalPay handles the command input `in $/200 n/coke d/10102019`. The arguments are parsed into the logic component where the subsequent model objects are created.

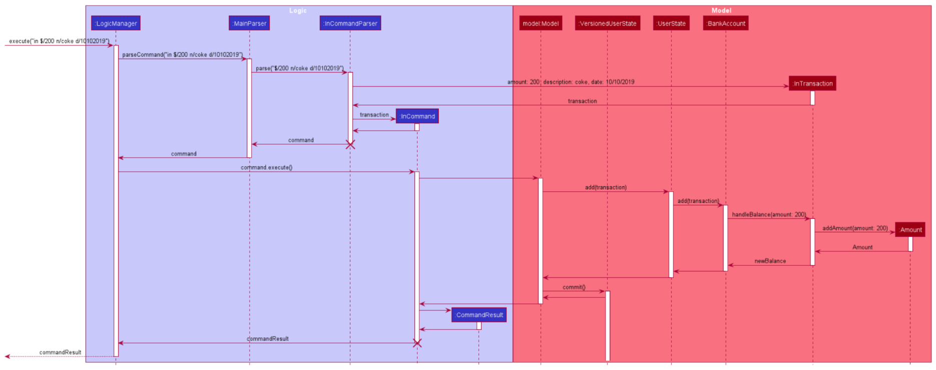


Figure 5. Sequence Diagram for Executing an `InCommand`

The `in` and `out` transaction follows the same logic flow after they are parsed.

The difference between `in` and `out` transactions is that the `handleBalance()` method called in the `BankAccount` results in an `addAmount` operation for the `inTransaction` and a `subtractAmount` operation for the `OutTransaction` class.

Example

Given that the `BankAccount` balance initially starts with 0 dollars.

- `in` Transaction of `$1000` will increase the `BankAccount` balance from $0 to $1000.
- `out` Transaction of `$250` will subsequently decrease the `BankAccount` balance from $1000 to $250.
- The Activity Diagram shown below will provide a visual representation of the two routes a Transaction object can take.

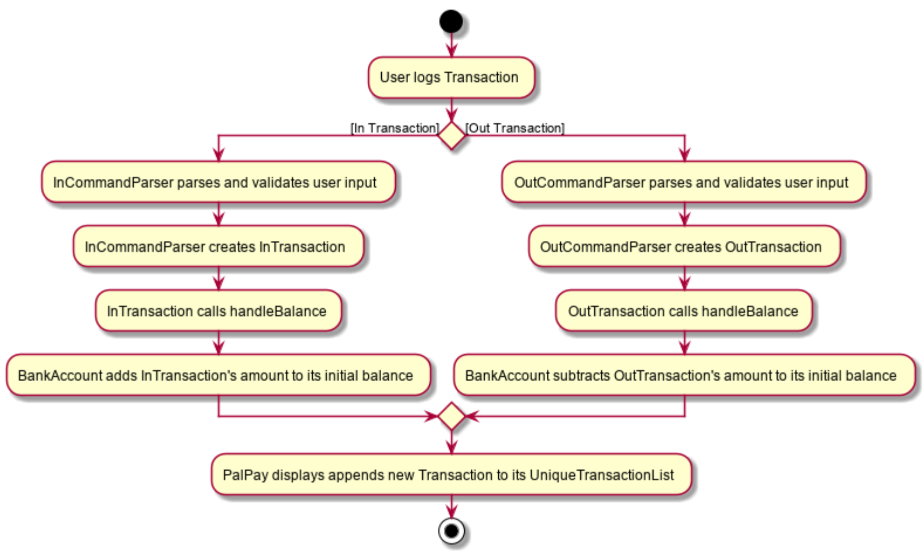

User logs Transaction
[In Transaction]
[Out Transaction]
InCommandParser parses and validates user input
InCommandParser creates InTransaction
InTransaction calls handleBalance
BankAccount adds InTransaction's amount to its initial balance
OutCommandParser parses and validates user input
OutCommandParser creates OutTransaction
OutTransaction calls handleBalance
BankAccount subtracts OutTransaction's amount to its initial balance
PalPay displays appends new Transaction to its UniqueTransactionList

Figure 6. Activity Diagram for In and Out Transactions

Design Considerations

- To prevent repetitive code implementation, the `Transaction` abstract class is used to facilitate income and expenditure logging. `Transaction` is an abstract class which contains the default constructor and commonly used variables. `InTransaction` and `OutTransaction` extends the `Transaction` class as they typically store an **amount**, **date**, **description**, and a set of **categories**. A code snippet of the `Transaction` abstract class is shown below.

```
public abstract class Transaction {

    protected Amount amount;
    protected Date date;
    protected Description description;
    protected final Set<Category> categories = new HashSet<>();

    public Transaction(Amount amount, Date date, Description description) {
        this.amount = amount;
        this.date = date;
        this.description = description;
    }
```

- The balance in `BankAccount` and the balance in `Ledger` are considered two separate identities, both being encompassed under the `UserState` class. Therefore user operations that deal with `BankAccount` implements the `BankAccountOperation` interface, while operations that deal with `Ledger` implements the `LedgerOperation` interface.
    - This allows us to achieve polymorphism by overloading methods in `Model` to handle the different operations correctly.
    - This reduces code coupling as there are different models to handle different balance amounts.
- A `Transaction` entry can affect a `Budget` which has similar categories and is within the same time period. The activity diagram bellow will further clarify this flow.

- Only Out Transactions can affect Budget.
- The activity diagram below shows how and when a Transaction object affects Budget.

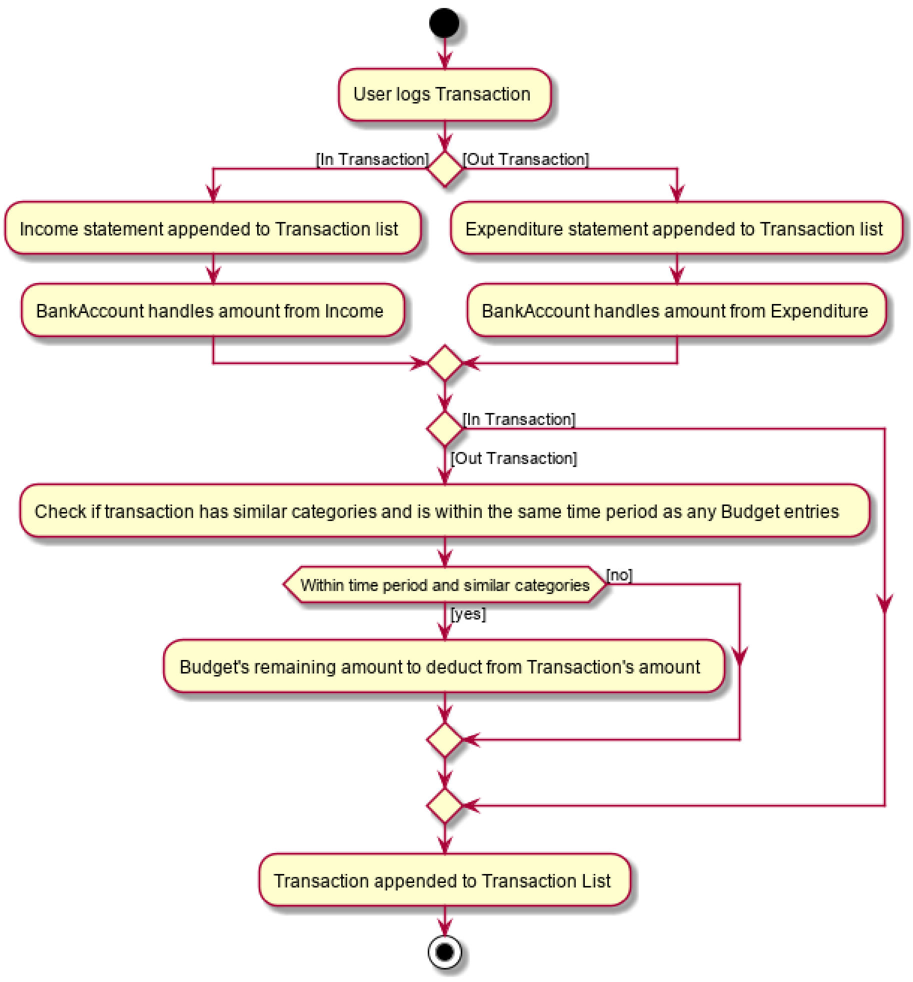

User logs Transaction
[In Transaction]
[Out Transaction]
Income statement appended to Transaction list
Expenditure statement appended to Transaction list
BankAccount handles amount from Income
BankAccount handles amount from Expenditure
[In Transaction]
[Out Transaction]
Check if transaction has similar categories and is within the same time period as any Budget entries
Within time period and similar categories
[no]
[yes]
Budget's remaining amount to deduct from Transaction's amount
Transaction appended to Transaction List

Figure 7. Activity Diagram for Out Transaction Affecting Budget

Update Existing Entry Feature: update

This feature currently allows users to update Transaction or Budget entries. The user is unable to perform this feature on Ledger operations. The rationale for this will be further explained in Aspect 2: Update can not edit Ledger Operations. The user is currently unable to perform this feature on Projection operations as it will be further implemented in future updates.

Current Implementation

Design Considerations

The update feature allows one or more fields of a Transaction or Budget to be updated. (e.g. `update t1 $/2` and `update t1 $/2 d/10102019` will both work as intended).

More often than not, users do not need to change an entire Transaction or Budget entry. This will minimize inputs from users if they do not require every single parameters of a Transaction or Budget to be changed.

Aspect 2: Update can not edit Ledger Operations

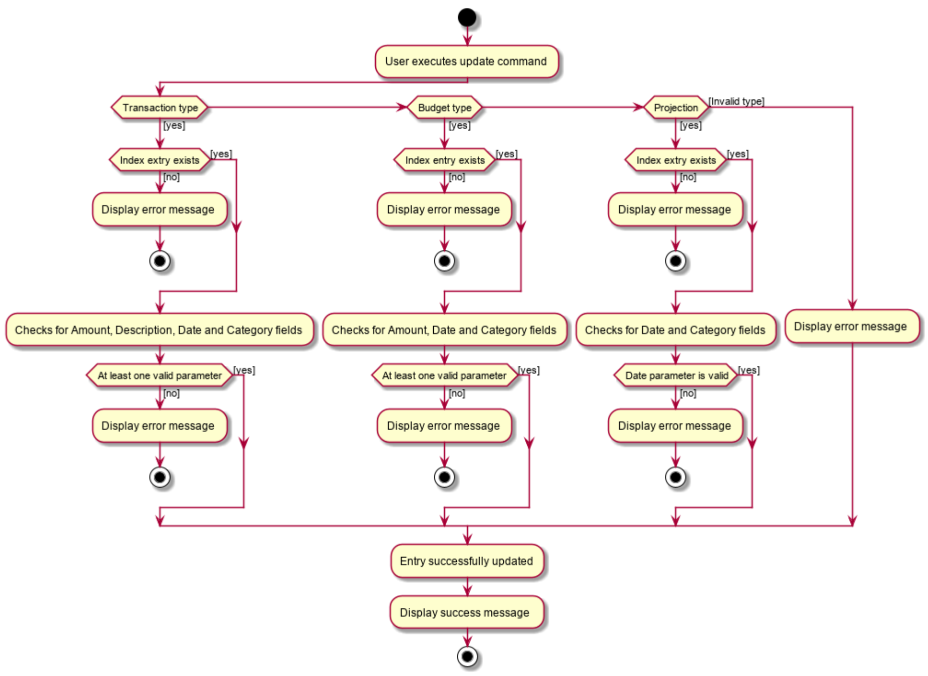
- **Alternative 1 (current choice):** Update Command does not work with `Ledger` operations.
  - Pros: Intuitive implementation and execution for the user.
  - Cons: Requires excessive user operations.
    - The user has to first delete the `Ledger` operation that he/she wishes to change, followed by inputting the `Ledger` operation with the amended fields back into *PalPay*.
- **Alternative 2:** Update Command to also work with `Ledger` operations.
  - Pros: Requires only one user command to append or change `Ledger` entries.
  - Cons: Results in convoluted implementation and user experience. This will also hinder future permeability of the `Split` feature.
    - `Ledger` operations such as `split` includes many repeated fields (i.e. multiple `Persons` and `shares` list).
    - Will require several conditional user inputs to differentiate between the various repeated entities that the user wishes to amend.

Future Enhancements

Update feature for Projections

Currently the update feature has not been implemented for `Projection` operations. In future iterations of PalPay, the update feature should work seamlessly with `Projection` operations, similar to that of `Transaction` and `Budget` operations

The activity diagram below will provide a visual representation of the possible user routes using the `update` command after this enhancement has been implemented.



User executes update command
Transaction type
Budget type
Projection
[invalid type]
[yes]
Index extry exists
Index entry exists
[yes]
[no]
Display error message
Checks for Amount, Description, Date and Category fields
Checks for Amount, Date and Category fields
Checks for Date and Category fields
At least one valid parameter
Date parameter is valid
Entry successfully updated
Display success message

Figure 8. Activity Diagram for Future `update`