

# Cash

## Get and update

- The cash at hand is initially 0
  - The cash cannot be updated with a negative value
    - returns false
    - cash remains unchanged
  - The cash can be updated with a positive value
    - returns true
    - cash amount is changed
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# Credit cards

## Get

- The list of credit cards is not null
- The number of credit cards is initially 0
- Trying to modify the list of cards is unsuccessful
  - throws an UnsupportedOperationException
  - list remains unchanged

## Add

- A new card can be added and retrieved
- Multiple cards can be added and retrieved
- Trying to add a new card with a duplicate name is unsuccessful
  - returns false
  - no new card is added
- Trying to add a new card with a null name is unsuccessful
  - returns false
  - no new card is added
- Trying to add a new card with a negative debt is unsuccessful
  - returns false
  - no new card is added

## Remove

- A card with a valid name can be removed
  - returns true
  - the card is not present in the list anymore
  - the rest of the cards remain unchanged

- Trying to remove a card with an invalid name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove a new card with a null name is unsuccessful
  - returns false
  - no card is removed
- Trying to remove a card from an empty list is unsuccessful

## Update name

- The name of an existing card can be updated
  - returns true
  - the updated card can be retrieved
  - the rest of the cards remain unchanged
- Trying to update a card which is not present is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card with a non-unique name is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card with a null name is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card before adding any is unsuccessful

## Update debt

- The debt of an existing card can be updated
  - returns true
  - the updated card can be retrieved
  - the rest of the cards remain unchanged
- Trying to update a card which is not present is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card with a null is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card with a negative debt is unsuccessful
  - returns false
  - the list of cards remains unchanged
- Trying to update a card before adding any is unsuccessful

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# Debit accounts

## Get

- The list of accounts is not null
- The number of accounts is initially 0
- Trying to modify the list of accounts is unsuccessful
  - throws an UnsupportedOperationException
  - list remains unchanged

## Add

- A new account can be added and retrieved
- Multiple accounts can be added and retrieved
- Trying to add a new account with a duplicate name is unsuccessful
  - returns false
  - no new account is added
- Trying to add a new account with a null name is unsuccessful
  - returns false
  - no new account is added
- Trying to add a new account with a negative balance is unsuccessful
  - returns false
  - no new account is added

## Remove

- An account with a valid name can be removed
  - returns true
  - the account is not present in the list anymore
  - the rest of the accounts remain unchanged
- Trying to remove an account with an invalid name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove an account with a null name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove an account from an empty list is unsuccessful

## Update name

- The name of an existing account can be updated
  - returns true
  - the updated account can be retrieved
  - the rest of the accounts remain unchanged
- Trying to update an account which is not present is unsuccessful
  - returns false
  - the list of accounts remains unchanged
- Trying to update an account with a non-unique name is unsuccessful

- returns false
  - the list of accounts remains unchanged
- Trying to update an account with a null name is unsuccessful
  - returns false
  - the list of accounts remains unchanged
- Trying to update an account before adding any is unsuccessful

## Update balance

- The balance of an existing account can be updated
    - returns true
    - the updated account can be retrieved
    - the rest of the account remain unchanged
  - Trying to update the balance of an account which is not present is unsuccessful
    - returns false
    - the list of account remains unchanged
  - Trying to update the balance of an account with a null name is unsuccessful
    - returns false
    - the list of account remains unchanged
  - Trying to update an account with a negative balance is unsuccessful
    - returns false
    - the list of account remains unchanged
  - Trying to update an account before adding any is unsuccessful
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# Category

## Get

- The list of categories is not null
- The number of categories is initially 0
- Trying to modify the list of categories is unsuccessful
  - throws an UnsupportedOperationException
  - list remains unchanged

## Add

- A new category can be added and retrieved
- Multiple categories can be added and retrieved
- Trying to add a new category with a duplicate name is unsuccessful
  - returns false
  - no new category is added
- Trying to add a new category with a null name is unsuccessful
  - returns false

- no new category is added
- Trying to add a new category with a null category type is unsuccessful
  - returns false
  - no new category is added

## Remove

- A category with a valid name can be removed
  - returns true
  - the category is not present in the list anymore
  - the rest of the categories remain unchanged
  - any existing transactions belong to this category will be renamed to **Miscellaneous Income** if the removed category was of type *INCOME* or to **Miscellaneous Expenditure** if the removed category was of type *EXPENDITURE*
  - the category will be removed from all budgets which have it.
- Trying to remove a category with an invalid name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove a category with a null name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove a category from an empty list is unsuccessful

## Update name

- The name of an existing category can be updated
  - returns true
  - the updated category can be retrieved
  - the rest of the categories remain unchanged
  - transaction and budget objects in that category must reflect this change
- Trying to update a category which is not present is unsuccessful
  - returns false
  - the list of categories remains unchanged
- Trying to update a category with a non-unique name is unsuccessful
  - returns false
  - the list of categories remains unchanged
- Trying to update a category with a null name is unsuccessful
  - returns false
  - the list of categories remains unchanged
- Trying to update a category before adding any is unsuccessful

## Update type

- The type of an existing category can be updated
  - returns true

- the updated category can be retrieved
    - the rest of the categories remain unchanged
    - transaction and budget objects in that category must reflect this change
  - Trying to update a category which is not present is unsuccessful
    - returns false
    - the list of categories remains unchanged
  - Trying to update a category with a null category is unsuccessful
    - returns false
    - the list of categories remains unchanged
  - Trying to update a category before adding any is unsuccessful
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## Budget

### Get

- The list of budgets is not null
- The number of budgets is initially 0
- Trying to modify the list of budgets is unsuccessful
  - throws an UnsupportedOperationException
  - list remains unchanged

### Add

- A new budget can be added and retrieved
- Multiple budgets can be added and retrieved
- Trying to add a new budget with a duplicate name is unsuccessful
  - returns false
  - no new budget is added
- Trying to add a new budget with a null or invalid start or end date is unsuccessful
  - returns false
  - no new budget is added
- Trying to add a new budget with a map containing invalid category name is unsuccessful
  - returns false
  - no new budget is added
- Trying to add a new budget with a map containing negative value is unsuccessful
  - returns false
  - no new budget is added
- A new budget with a null or empty map of budget items can be added
  - returns true
  - a new budget with no items is added

### Remove

- A budget with a valid name can be removed
  - returns true
  - the budget is not present in the list anymore
  - the rest of the budgets remain unchanged
- Trying to remove a budget with an invalid name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove a budget with a null name is unsuccessful
  - returns false
  - the list contents remain unchanged
- Trying to remove a budget from an empty list is unsuccessful

## **Update name**

- The name of an existing budget can be updated
  - returns true
  - the updated budget can be retrieved
  - the rest of the budgets remain unchanged
- Trying to update a budget which is not present is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with a non-unique name is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with a null name is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget before adding any is unsuccessful

## **Update start date**

- The start date of an existing budget can be updated
  - returns true
  - the updated budget can be retrieved
  - the rest of the budgets remain unchanged
- Trying to update a budget which is not present is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with an invalid (later than end date) start date is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with a null start date is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget before adding any is unsuccessful

## Update end date

- The end date of an existing budget can be updated
  - returns true
  - the updated budget can be retrieved
  - the rest of the budgets remain unchanged
- Trying to update a budget which is not present is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with an invalid (later than end date) start date is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget with a null start date is unsuccessful
  - returns false
  - the list of budgets remains unchanged
- Trying to update a budget before adding any is unsuccessful

## Add or update budget item

- A new budget item can be updated
  - returns true
  - if the item was not present, its added and can be retrieved
  - if the item was present, its value is updated and can be retrieved
- Trying to update a budget with a null name is unsuccessful
  - returns false
  - the list of budget items remains unchanged
- Trying to update a budget which is not present is unsuccessful
  - returns false
  - the list of budget items remains unchanged
- Trying to update a budget with a null or invalid category-name is unsuccessful
  - returns false
  - the list of budget items remains unchanged
- Trying to update a budget with a negative value is unsuccessful
  - returns false
  - the list of budget items remains unchanged

## Remove budget item

- A budget item in the current budget can be removed
  - returns true
  - the item is no longer present in the budget
- Trying to update a budget with a null or invalid name is unsuccessful
  - returns false
  - the list of budget items remains unchanged
- Trying to update a budget with a null or invalid category name is unsuccessful
  - returns false



- the list of budget items remains unchanged
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# Transaction

## Get

- The list of transactions is not null
- The number of transactions in any date range is initially 0
- Trying to get a list of transactions for null dates is unsuccessful
  - throws an `IllegalArgumentException`
- Trying to get a list of transactions for invalid dates is unsuccessful
  - - throws an `IllegalArgumentException`
- Trying to modify the list of transactions is unsuccessful
  - throws an `UnsupportedOperationException`
  - list remains unchanged
- Each transaction will have a unique id

## Add

- Trying to add a new transaction with a null or future date is unsuccessful
  - returns -1
  - no new transaction is added
- Trying to add a new transaction with a null or empty description is unsuccessful
  - returns -1
  - no new transaction is added
- Trying to add a new transaction with a negative amount is unsuccessful
  - returns -1
  - no new transaction is added
- Trying to add a new transaction which will negate the value in the associated account (that is the transaction amount is greater than the available balance) is unsuccessful
  - returns -1
  - no new transaction is added
- Trying to add a new transaction with a null or invalid category name is unsuccessful
  - returns -1
  - no new transaction is added
- Trying to add a new transaction with a null or invalid account name is unsuccessful
  - returns -1
  - no new transaction is added
- The first valid transaction to be added will have an id 0
  - returns 0
  - the new transaction can be retrieved given the valid date range
- The second valid transaction to be added will have an id 1

- returns 1
  - the new transaction can be retrieved given the valid date range
- A number of valid transactions can be added and retrieved back
- Every time a transaction is added, the value in the associated account will be changed accordingly.

## **Remove**

- Trying to remove a transaction with an invalid id is unsuccessful
  - returns false
  - no new transaction is added
- Trying to remove a transaction with a valid id is successful
  - returns true
  - the transaction is not present in the list anymore
  - the next valid transaction to be added will be assigned this id

## **Update date**

- Trying to update a transaction with an invalid id is unsuccessful
  - returns false
  - the list of transactions is unchanged
- Trying to update a transaction with a null or future date is unsuccessful
  - returns false
  - the transaction is not modified
- Trying to update a transaction with a valid id and date is successful
  - returns true
  - the transaction is updated

## **Update description**

- Trying to update a transaction with an invalid id is unsuccessful
  - returns false
  - the list of transactions is unchanged
- Trying to update a transaction with a null or empty description is unsuccessful
  - returns false
  - the transaction is not modified
- Trying to update a transaction with a valid id and description is successful
  - returns true
  - the transaction is updated

## **Update amount**

- Trying to update a transaction with an invalid id is unsuccessful
  - returns false
  - the list of transactions is unchanged
- Trying to update a transaction with a negative amount is unsuccessful

- returns false
  - the transaction is not modified
- Trying to update a transaction with a valid id and amount is successful
  - returns true
  - the transaction is updated

## Update category

- Trying to update a transaction with an invalid id is unsuccessful
    - returns false
    - the list of transactions is unchanged
  - Trying to update a transaction with a null or invalid category name is unsuccessful
    - returns false
    - the transaction is not modified
  - Trying to update a transaction with a valid id and category name is successful
    - returns true
    - the transaction is updated
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# Status

## Get

- Trying to get the status with a null or invalid budget name is unsuccessful
  - returns false
- Trying to get the status with a null map of projected amounts is unsuccessful
  - returns false
- Trying to get the status with a null map of actual amounts is unsuccessful
  - returns false
- Trying to get the status with valid budget name and maps is successful
  - if either of the maps passed to the method are non-empty, they are cleared
  - The map called projected contains the category names and the projected values in the budget
  - The map called actual contains the total values of all transactions in the budget's date-range, grouped by their categories.
  - returns true