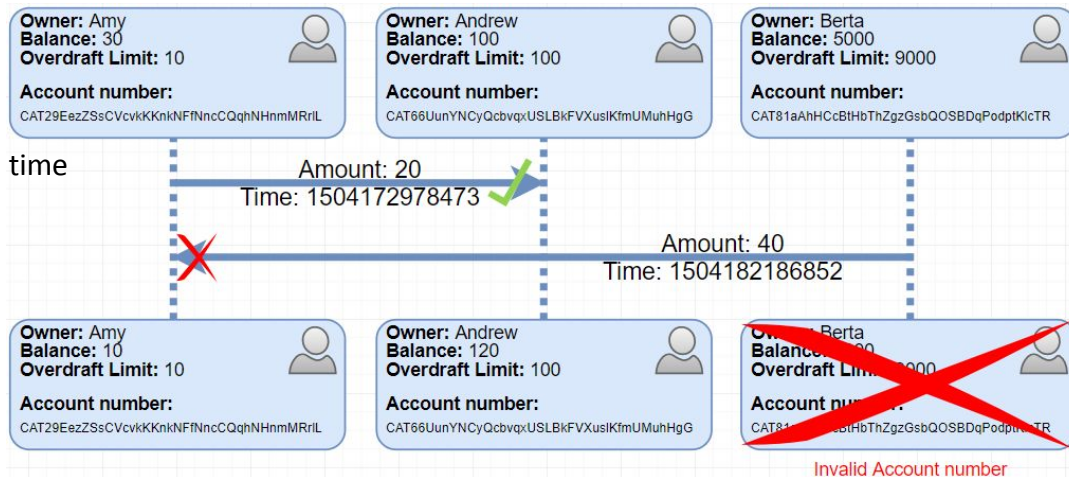# Level 2 - Almost real Banking

Definitions

- Accounts have owners, balances, **account numbers** and **overdraft limits**
- The **overdraft limit**: amount of money allowed to be spent in excess of the balance
- Transactions are executed in order of submission time

Task

- Execute **valid** transactions
- Report the final account balances for **valid account numbers** (see Example slide).

Account Number Validation

Definition

- Format: CAT<Checksum><AccountID>
  - Country Code: "CAT"
  - Checksum: 2 digit checksum
  - AccountID: 10 a-zA-Z characters
- Valid CAT-BANS need to have an equivalent uppercase for every lower case letter and vice versa in the **<AccountID>**
  - They need to contain equally many 'A' and 'a', 'B' and 'b' etc.
- The checksum is calculated as follows:
  - sum ASCII codes of:
    - <AccountID>CAT00
  - Remainder of ASCII sum divided by 97
  - Checksum = 98 - remainder

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Account Number Validation - Example

Example

- CAT00aabbAaBABA
  - AccountID contains 3 lowercase and uppercase 'a' as well as 2 lowercase and uppercase 'b'
  - aabbAaBABACAT00 -> 3*97('a') + 3*65('A') + 2*98('b') + 2*66('B') + 67('C') + 65('A') + 84('T') + 2*48('0') = 1126
  - Rest of division of 1126 by 97 (i.e. 1126 % 97) = 59 -> 98-59 = 39
  - Replace 00 with the 39 (=calculated checksum) CAT39aabbAaBABA

Data format

Input

`<NumberOfAccounts>` the number of ledgers in the banking system

NumberOfAccounts lines: `<PersonName> <AccountNumber> <ActualAccountBalance> <OverdraftLimit>`

`<NumberOfTransactions>` the number transactions
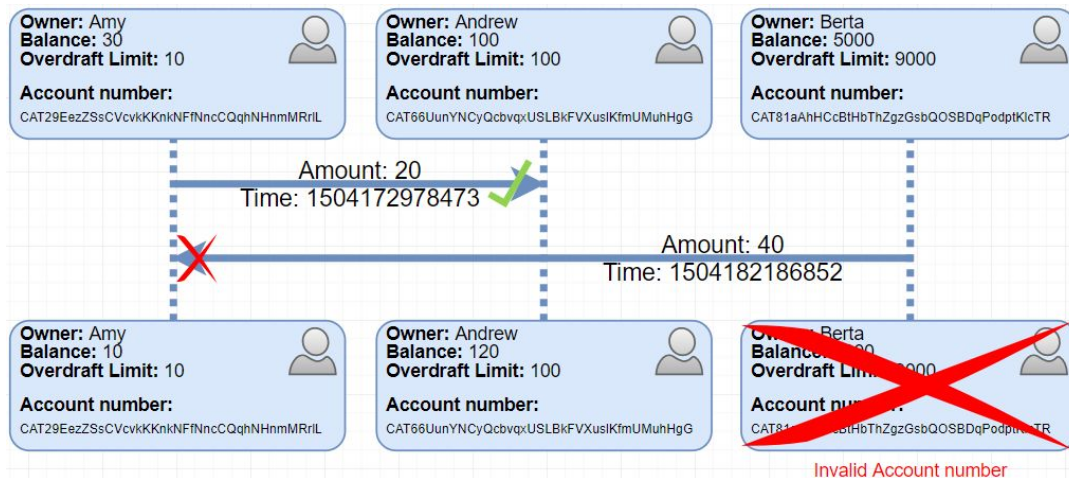
NumberOfTransactions lines: `<AccountNumberFrom> <AccountNumberTo> <Amount> <TransactionSubmitTime>`

Output

`<NumberOfValidAccounts>`

NumberOfValidAccounts lines: `<PersonName> <AccountBalanceAfterTransactions>`

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Example

Input

```
3
Amy CAT65XxyjjYJvJV 15 10
Andrew CAT18bBxXUuPpCc 100 100
Berta CAT37yYDndNWLAw 5000 9000
2
CAT65XxyjjYJvJV CAT18bBxXUuPpCc 20 1504172978473
CAT37yYDndNWLAw CAT65XxyjjYJvJV 40 1504182186852
```

Output

```
2
Amy -5
Andrew 120
```


@ Catalysts GmbH

Level 2