# CS 446 Project Proposal
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Let's say you lend a friend 20 dollars and ask him to pay you back later? How do you keep track of that? Do you make a mental note? Or perhaps you write it down in your personal notes? It's easy enough to keep track of one loan, but we all borrow and loan money more often that we'd like to think. For example, you might have paid the bill at a restaurant for a group of friends or bought some utensils for a colleague. Our project idea is to create an app that allows users to share loans or bills with their friends and to be able to easily and conveniently repay them.

The inspiration for our project comes from the popular app Splitwise. Splitwise is an app that allows you to send a bill to another user which can be repaid later. Our idea is to add onto this basic idea by simplifying all the loans that we must pay to others. Our end goal is to create an app where you can pay off everyone with the click of a single button. Splitwise is an app that only keeps track of the loans. To settle a loan, you would have to either manually repay them or use a third-party application like Venmo. To simplify the experience for the users, our app will be able to also function as a wallet. The users will be able to also store their money in our system which allows for an even more smooth repayment process.

With the advent of technology, we have a wide array of powerful tools at the tip of our fingertips. One of the major advantages is that our lives are more convenient. For example, we don't have to buy papers maps anymore since we could just pull out our phones and get to our destination using a GPS. Additionally, we don't have to read a newspaper column about interesting restaurants in a new city since we can just use a food review application. Keeping track of loans can be long and tedious and quite often we may just forget a bill or two. Our application not only allows you to keep track of bills but also allows you to pay them relatively easily and we believe this would also conviveence many people's lives.

This is an application that is most useful in mobile form. We loan and borrow money all the time and all over the place and the only technology most of us carry around is our phones. Aa a mobile application, we can pull our phones and open the app whenever we want to add a new loan to the system.

Our group originally came up with two ideas – a messenger app and the loan repayment app. As there are many messenger apps out there, we had trouble coming up with a way to make the application creative. Our main issue with the loan repayment app was that we didn't want it to be identical to the application Splitwise. We decided that if we can come up with ideas that add onto the Splitwise application that would be useful to us, then we could justify creating a similar app. We came up with the features to add that were described above. This is an application that we would use, so we decided that we wanted to build this application.

Functional Properties

1. The user should be able to login their account on the system
    1.1. An account creation page should be made available to first time users
    1.2. Accounts can be recovered if the user forgets their password
    1.3. Users should be able to logout once they are logged into the system
2. The user should be able to find another user's profile on the system
    2.1. A search page should allow users to find others by name or account ID
    2.2. Clicking on a searched-up user should bring you to their profile page with their information that they choose to display to the public
    2.3. Users should be able to generate a code that allows another user to enter the code to directly bring them to their user page
    2.4. Users should be able to add other users to their contact's list
    2.5. Users should also be able to add other users to their trusted friend list which is used as a factor for simplifying bills
3. The user should be able to access their contact list
    3.1. Clicking on any of your contacts on the list should bring them to their profiles
    3.2. User should be able to view their trusted friends among their contact list
    3.3. Users should be able to remove friends from their trusted list and contacts from their contact list
4. The user should be able to access their balance page
    4.1. The top of the page should display two values – their total outstanding balance and their total owed balance. These numbers will be as simplified as possible
    4.2. The user should be able to tap on their outstanding balance to pay off all debts if there is enough money in their wallet
    4.3. Both the outstanding and owed balances can be expanded to see the exact amount of money outstanding or owed to each and every user in a list
    4.4. The user can settle their outstanding debt to one specific user by expanding their outstanding balances and finding the specific user in the list
    4.5. The user should be able to manually settle their debt to any specific user. The other user will get a notification on their balance page where they can either accept or decline the manual settlement
    4.6. The user should be able to view a history of all the loans that affect their balances along with system calculations that simplify the balance values
5. The user should be view all the details of their individual money loans
    5.1. Clicking on each individual money loan will provide more details about it
    5.2. Users should be able to add two types of loans to another user on their contact lists. These are regular loans and bill splitting loans. Adding a loan to another users means that they owe you money
    5.3. Users will receive a notification whenever another user adds them to a loan which they can accept or decline on this page too

6. The user should be able to access their wallet
    6.1. The amount of money the user has should be displayed in their wallet
    6.2. The user should be able to withdraw money from their wallet to their personal bank accounts
    6.3. The user should be able to add money into their wallet if they don't have enough to pay off their debts
7. The users should have access to a settings page
    7.1. Privacy settings can be changed on this page
    7.2. Users will be able to change their account information
    7.3. Emails and phone numbers should be able to be changed and registered to an account

Functional Use Cases

As a hypothetical, let's say Person A lends person B 20 dollars. If the both use this app, then person A would login to the system and send a loan to person B as described in property 5.2. Then person B would receive a notification and accept the loan on their account. If they view their balances as described in property 4.1, person A has a total owed balance of 20 dollars and person B has an outstanding balance of 20 dollars. This is assuming that they both have no other loans on the system. Later, Person B lends Person C 20 dollars. The follow the same process and person C should have an outstanding balance of 20 dollars. Person B should have an owed balance of 20 dollars in addition to the outstanding balance that they had before. If person A, B and C were all close friends, the system will simplify this by clearing person B's outstanding balance and owed balance. This essentially cuts of the middleman and if this is done on a larger scale it makes it easier for all parties involved. All the people involved must be close friends for the debt to be simplified since in the scenario, Person A might not necessarily trust person C to pay them back.

As mentioned in property 5.2, you can add both a regular loan and a bill splitting loan. When you select the bill splitting loan option, you can send out loans to multiple people at a time as it splits the cost of a total bill. Let's say you rent a car with 3 other friends and you pay the bill of 200 dollars. You can use the app to send all 3 friends a loan. As 200 divided by 4 is 50, the system will send each friend a 50-dollar loan which they can subsequently accept. A caveat is that a total bill might not be split evenly. For example, friends eating at a restaurant might purchase menu items at different costs. The bill splitting option will allow a user to enter all the items on the receipt, along with who ordered them, and the total amount due. It will properly calculate the total amount of the bill that each user must cover and send out the loans accordingly.

Non-Functional Properties

1. All data will be backed up daily at 12 PM Eastern. Since the system is supposed to keep track of everyone's loans, it is crucial that this data is not lost or corrupted.
2. Outstanding and owed balance numbers should not be able to be modified by any user. The system is the only one who should be able to update this number.

## Search for names, account number

### Recent Transferred Friends ···

Janice

EA
Edward

Jesse

AD
Allan

Brenda

Joseph

### Friend List ···

**Marisa Fair**
No product is an island. A…

KE **Kenneth Erickson**
designed with not only the…

**Michelle Lake**
UX designers don't just focus…

**Lanette Strand**

Friends    Groups    ➕    Bills    Accounts

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## ADD a LOAN

Outstanding Balance     Owed Balance

# $713.12    $235.20

### Bill 01 ◁

**Dinner at Din Tai Fung**
Owe @Jeremy_W
CAD$ 24.55

Click for details

| 4.1 | 13.2 | 9k | Open |
|-----|------|-----|------|
| Rating | Km | People | Operation |

### Bill 02 ◁

**Lunch at Subway**
Owe @Kaitlin_cc
CAD$ 12.15
Lend @James_Young
CAD$ 10.95

Click for details

| 3.8 | 2.6 | 5k | Open |
|-----|------|-----|------|
| Rating | Km | People | Operation |

Friends    Groups    ➕    Bills    Accounts