Cryptomoney App User Guide
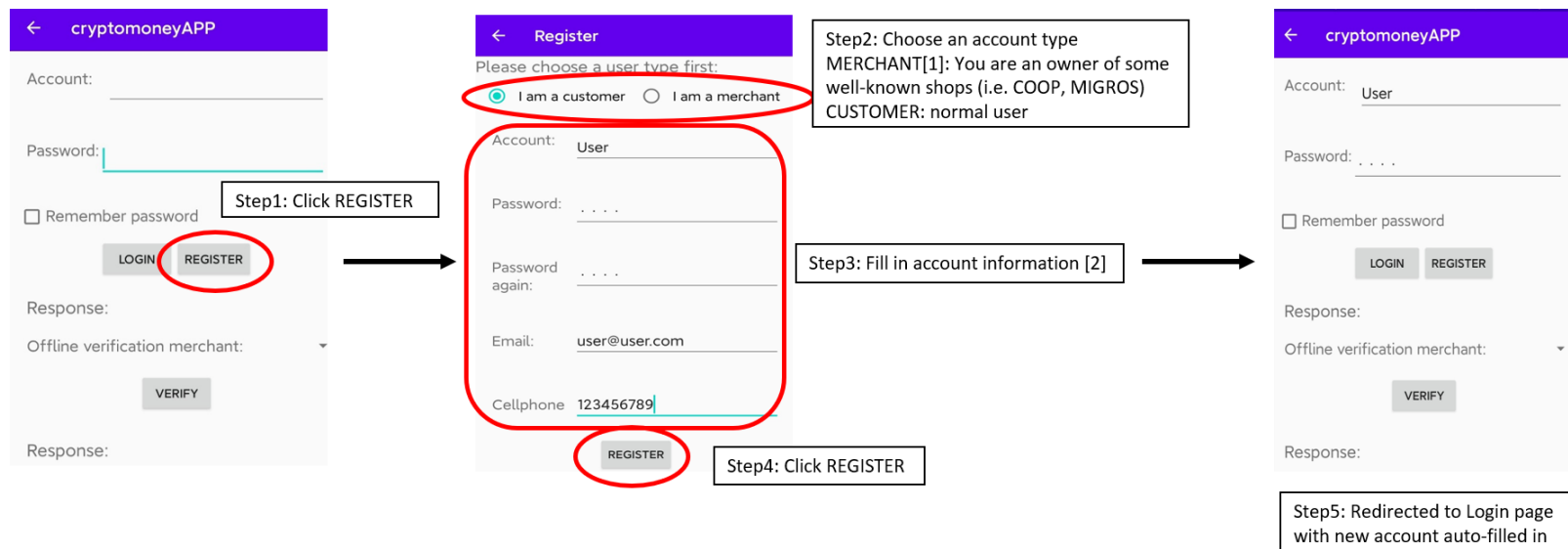
1. Introduction

This Android App is a prototype of a new crypto-money model. In this App, users can generate their own crypto-money and receive crypto-money from others in a safe and convenient way. Customers can pay with their crypto-money and merchants can verify the money offline. This user guide will explain how users can achieve that with this app.

2. App Instructions

2.1 Register a new account

Step2: Choose an account type
MERCHANT[1]: You are an owner of some well-known shops (i.e. COOP, MIGROS)
CUSTOMER: normal user

Step1: Click REGISTER

Step3: Fill in account information [2]

Step4: Click REGISTER

Step5: Redirected to Login page with new account auto-filled in
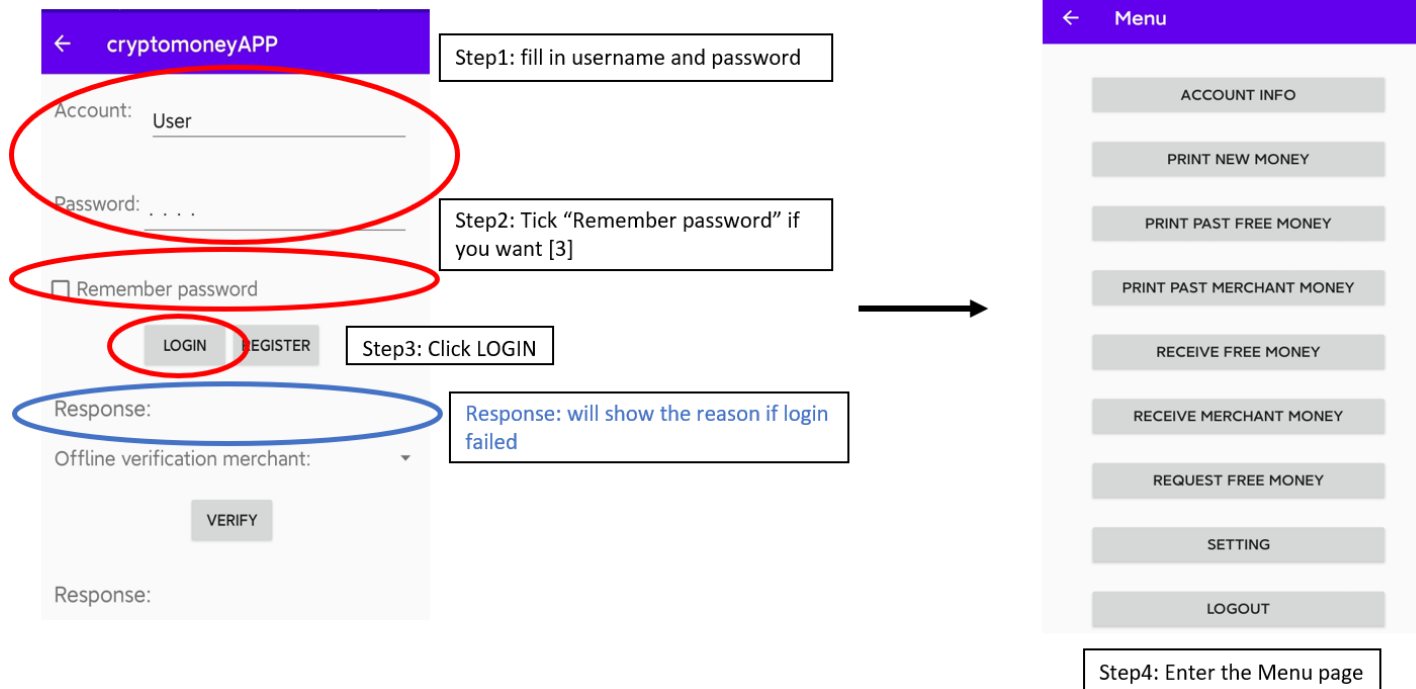
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[1] You should not choose the merchant type if you are not sure
[2] Be careful, the account information cannot be modified after registration

2.2 Log in to your account

Step1: fill in username and password

Step2: Tick "Remember password" if you want [3]

Step3: Click LOGIN

Response: will show the reason if login failed

Step4: Enter the Menu page

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[3] If you tick "Remember password", the next time you open the app, it will auto-fill the latest username and password you used. Be careful not to tick this when you are not using your own phone

2.3 View your account info

Step1: Click ACCOUNT INFO

Step2: Check your account ID and account balance here[4]

Step3: Pull down to refresh your account balance
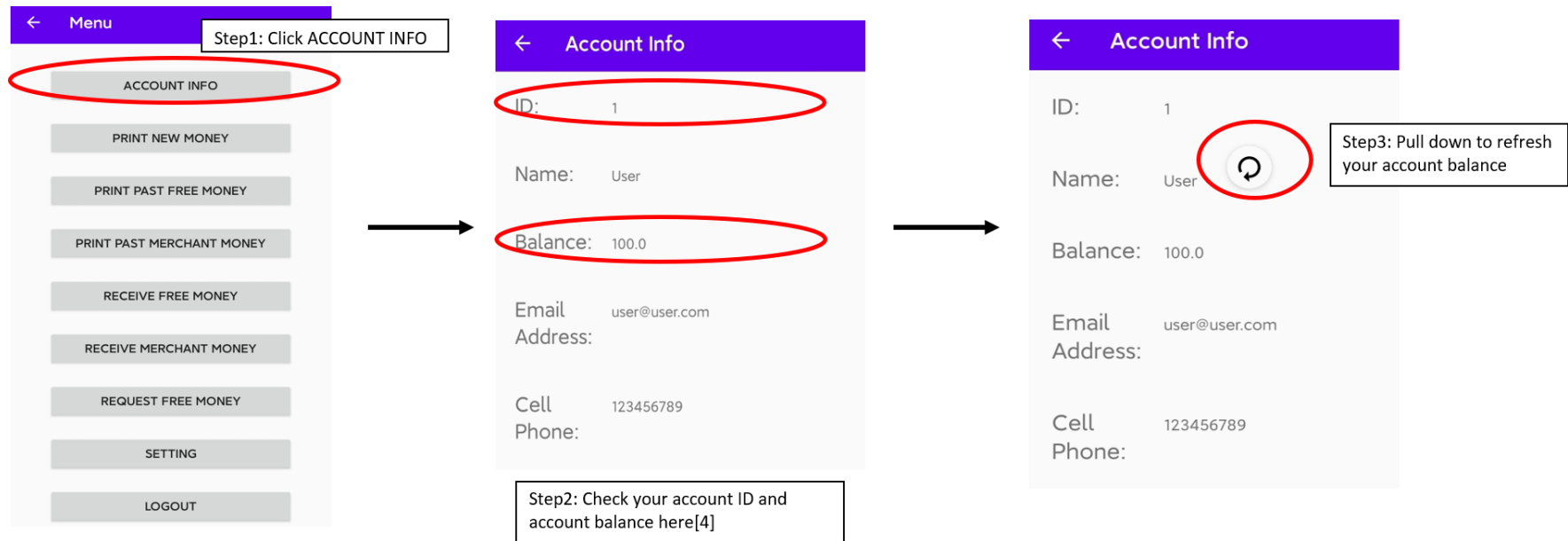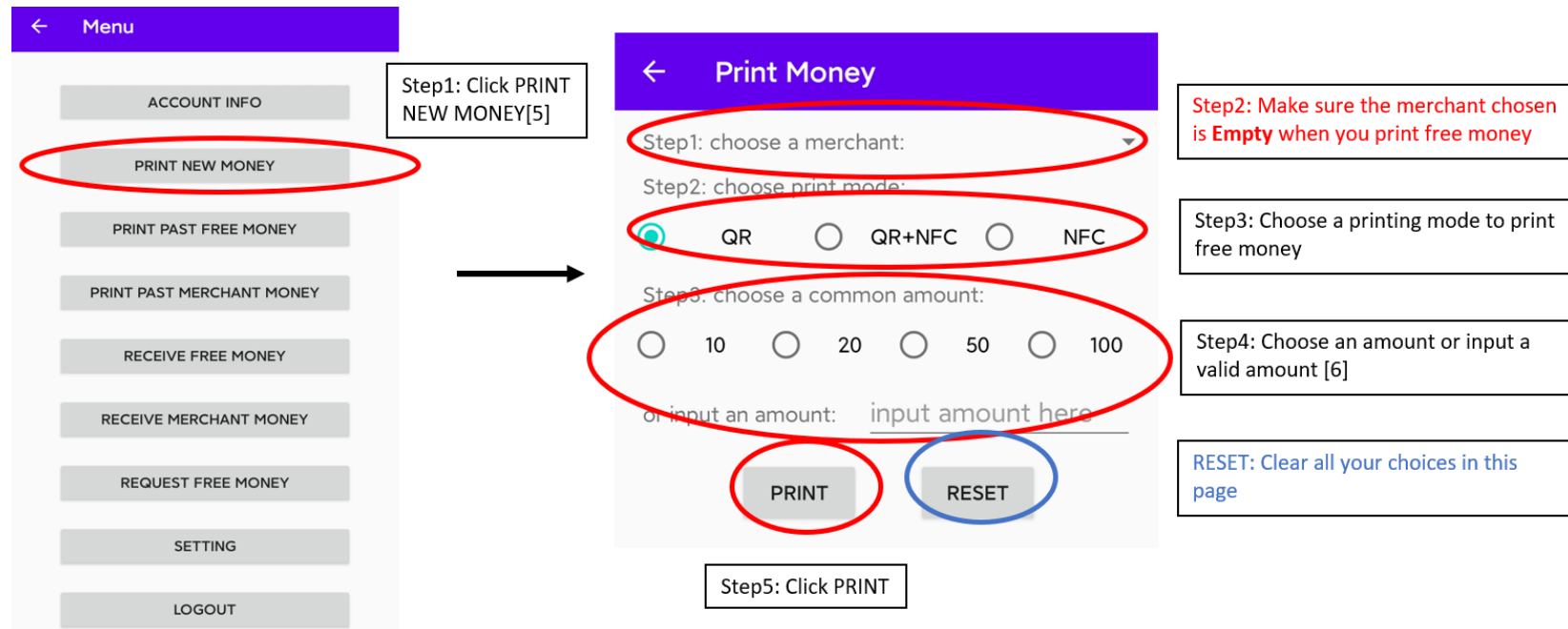
2.4 Print your money

The app provides two kinds of money to print. The first one is called **free money**. A free money can be received by **anyone** as long as he/she has your crypto-money. The other one is called **merchant-specific money**, this money can **only** be received by the merchant you select when printing the money.

2.4.1 Print new free money

Step1: Click PRINT NEW MONEY[5]

Step2: Make sure the merchant chosen is **Empty** when you print free money

Step3: Choose a printing mode to print free money

Step4: Choose an amount or input a valid amount [6]

RESET: Clear all your choices in this page

Step5: Click PRINT

Before entering the Print Money page, there could appear a loading icon meaning that the app is searching for a **MEMOBIRD printer**. See more details in 2.4.5.

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[5] Please grant any permission that the app asks you (i.e. Bluetooth, Location, Storage, Camera)
[6] If your account balance is not enough, you will not be allowed to print this money

2.4.2 Print past free money

Once a free money has been generated, your account balance will be **immediately deducted** by the corresponding amount. You can revoke a free money by receiving it by yourself (see 2.5). You can also print a free money that has been generated by you **on the same phone** before (and **not received by anyone** yet). When printing a past free money, your account balance will not change. This can be useful when you accidentally lose or break your money.

Step1: Click PRINT PAST FREE MONEY

Step2: Choose a printing mode to print past free money

Step3: Choose a past free money record to print (pull down to refresh)[7]
Amount: crypto-money value
Address: the unique identifier of this money
Time: time when you first generate this money

RESET: Clear all your choices in this page

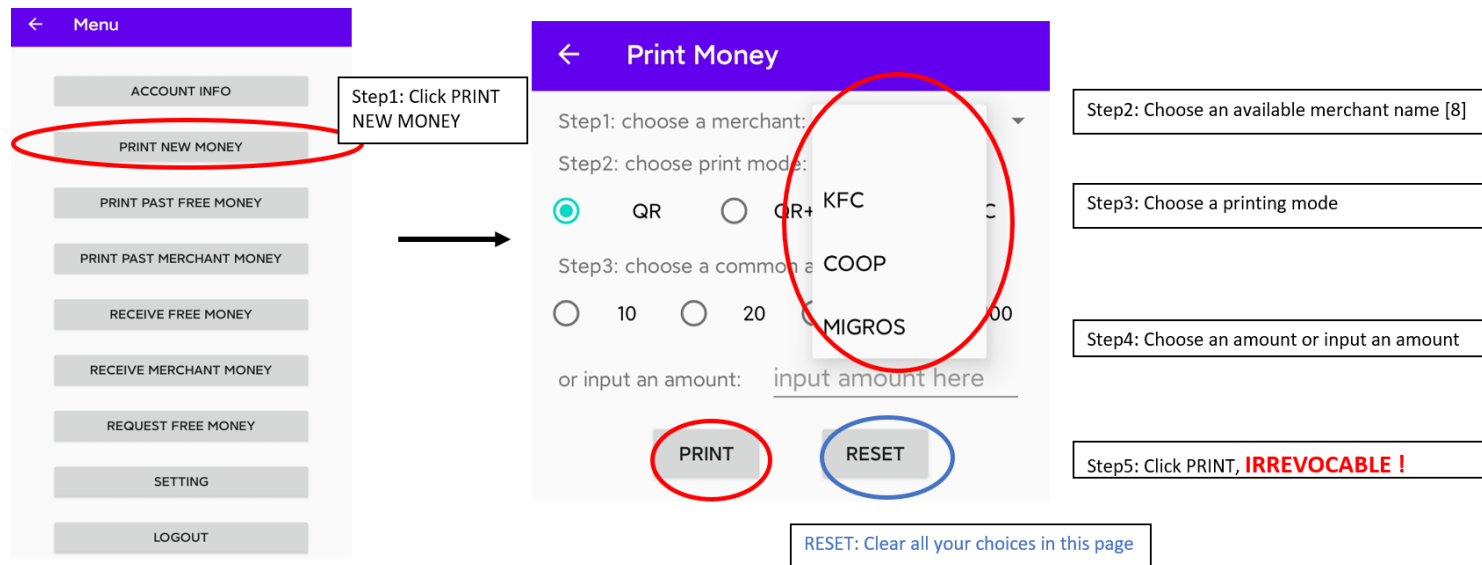Step4: Click PRINT

[7] The list will only show the records that have not been received by anyone yet

2.4.3 Print new merchant-specific money
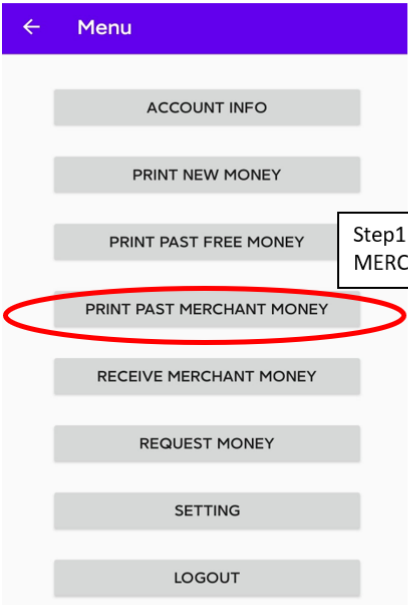
The merchant-specific money guarantees that **only** the specified merchant can decrypt and receive this money. **BE CAREFUL**, once you have generated a merchant-specific, you **CANNOT** revoke it (but only spend it).
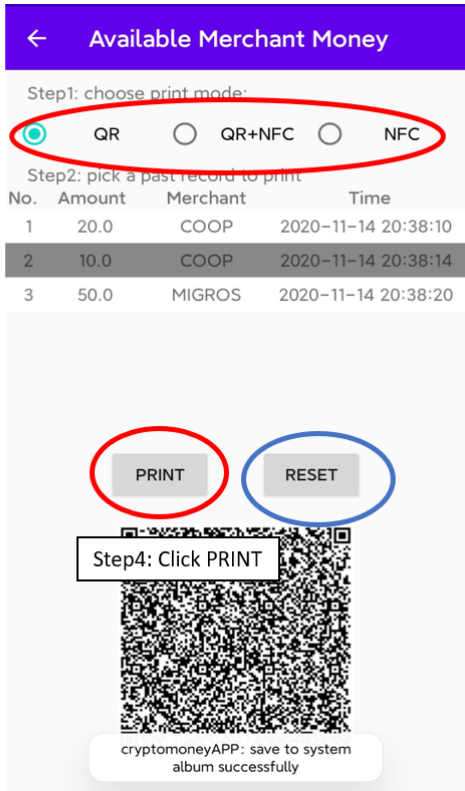
2.4.4 Print past merchant-specific money

Once a merchant-specific money has been generated, your account balance will be **immediately deducted**. You can also print a merchant-specific money that has been generated by you **on the same phone** before (and **not received by the merchant yet**). When printing a past merchant-specific money, your account balance will not change.

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[8] Depend on how many merchants have registered in the system

Menu

ACCOUNT INFO

PRINT NEW MONEY

PRINT PAST FREE MONEY

Step1: Click PRINT PAST MERCHANT MONEY

PRINT PAST MERCHANT MONEY

RECEIVE MERCHANT MONEY

REQUEST MONEY

SETTING

LOGOUT

Available Merchant Money

Step1: choose print mode:

○ QR   ○ QR+NFC   ○ NFC

Step2: pick a past record to print

No.	Amount	Merchant	Time
1	20.0	COOP	2020−11−14 20:38:10
2	10.0	COOP	2020−11−14 20:38:14
3	50.0	MIGROS	2020−11−14 20:38:20

PRINT   RESET

Step4: Click PRINT

cryptomoneyAPP: save to system album successfully

Step2: Choose a printing mode to print past merchant-specific money

Step3: Choose a past merchant-specific money record to print (pull down to refresh)
Amount: crypto-money value
Merchant: the specified merchant of this money
Time: time when you first generate this money

RESET: Clear all your choices in this page

2.4.5 Different printing modes
There are three printing modes to print money. The following table explains them.

Mode	Equipment	Description	Security
QR	(MEMOBIRD printer)	Store all crypto-money information in a QR code	medium

QR+NFC	(MEMOBIRD printer), NFC tag[9]	Store crypto-money information in both QR code and NFC tag	high
NFC	NFC tag[9]	Store all crypto-money information in an NFC tag	medium

In the QR and QR+NFC mode, the generated QR image will also be automatically saved to your system album.

The following figures show the free money printing process without a MEMOBIRD printer in QR+NFC mode.
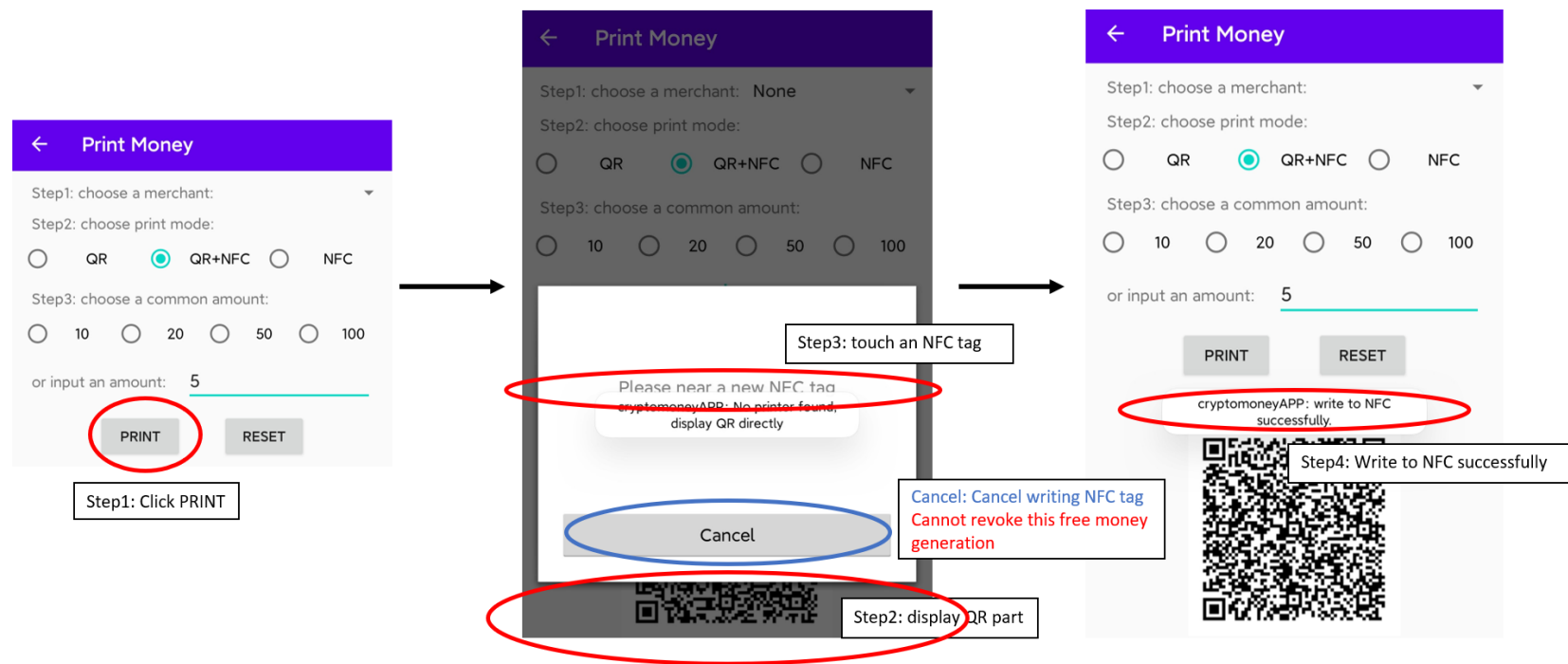
[9] NFC tag storage must be >400 bytes (usually 888 bytes)

The left figure shows the QR part format printed out / saved in the system album.

The right figure shows the COOP-specific money printing result with a MEMOBIRD printer in QR mode (phone: MI 10)
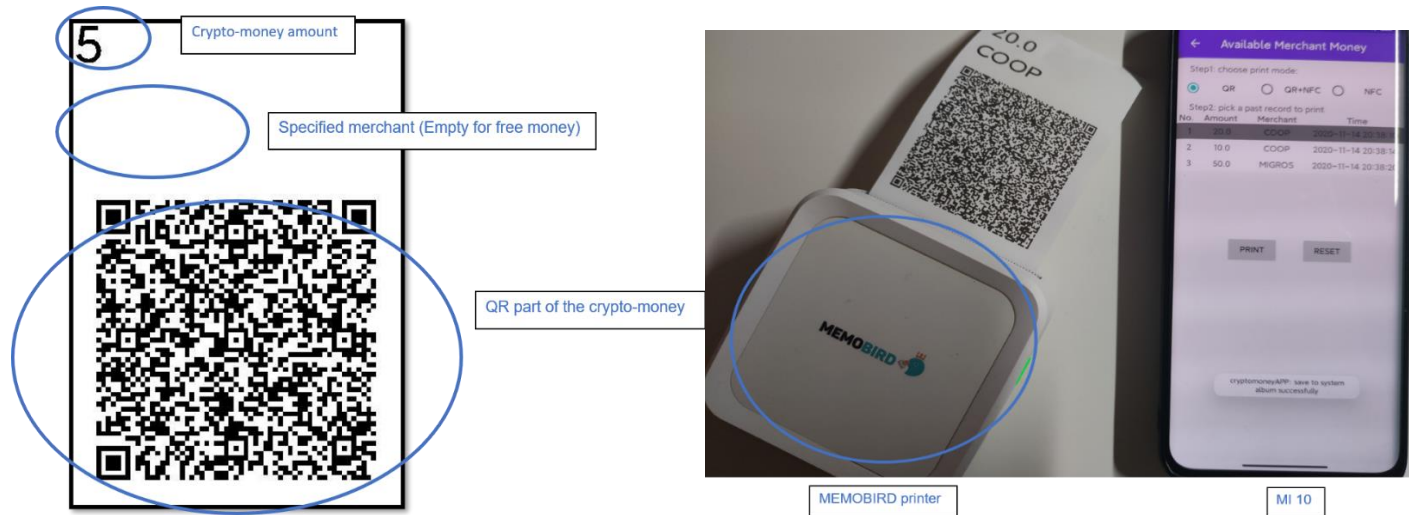
2.5 Receive other's free money

Free money can be received by anyone by scanning the QR code and/or reading the NFC tag. The receiver must have the **Internet connection** when receiving free money. You will receive the same money as you scan/read.

Step2.1: If the money is in NFC mode, the receiver should Click next to skip QR scan process and start to read the NFC tag manually

Album: select a QR image from an album

Cancel: Cancel receiving money. This operation will not expire the money

Step1: Click RECEIVE FREE MONEY

Step2.2: Scan QR part (for QR and QR+NFC mode)

Step2.3: Based on the QR scan result, the app will determine if an NFC part is needed, if so, a pop-up shows to read NFC tag (for QR+NFC and NFC mode)

Step3: Receive money successfully (check your account balance). The QR image and NFC tag are now expired[10]
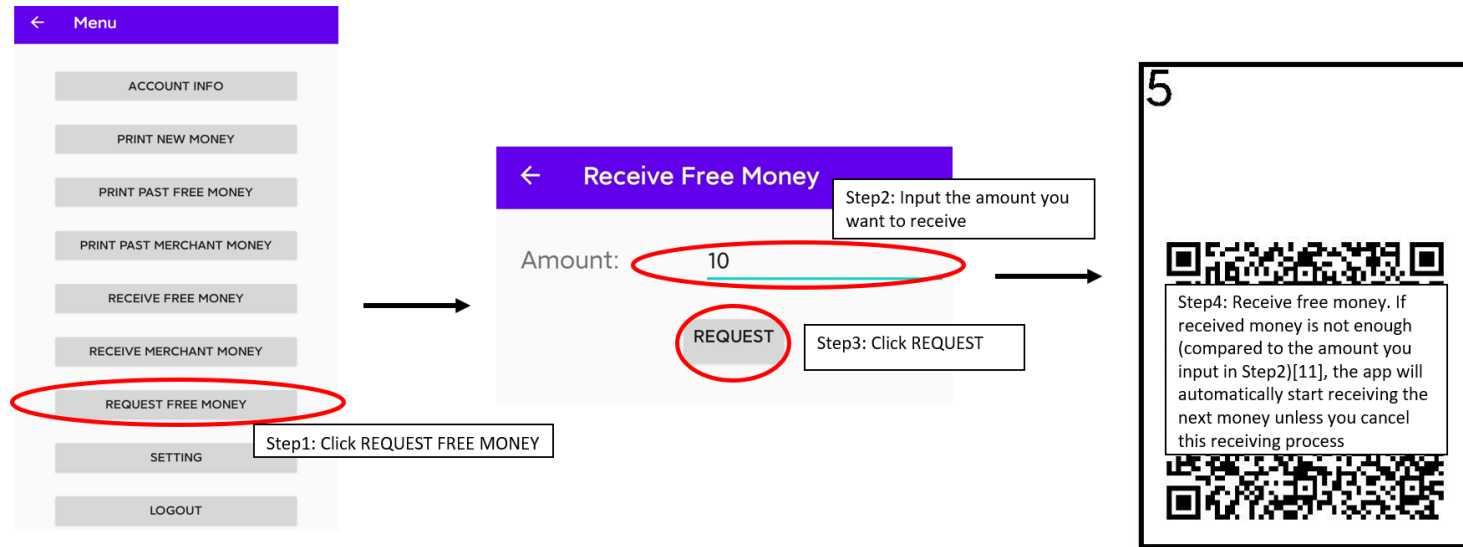
2.6 Request other's free money (for merchant)

The app considers different scenarios for a merchant requesting crypto-money. Besides general requesting process, the merchant receiver can change the amount he/she wants to request, or cancel the requesting process.

2.6.1 General requesting process

You need to input your request amount before receiving money. Similar to 2.5, you must have the Internet connection.

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[10] If you try to receive the money twice, you will get a "expired token" notification

Step1: Click REQUEST FREE MONEY

Step2: Input the amount you want to receive

Step3: Click REQUEST

Step4: Receive free money. If received money is not enough (compared to the amount you input in Step2)[11], the app will automatically start receiving the next money unless you cancel this receiving process
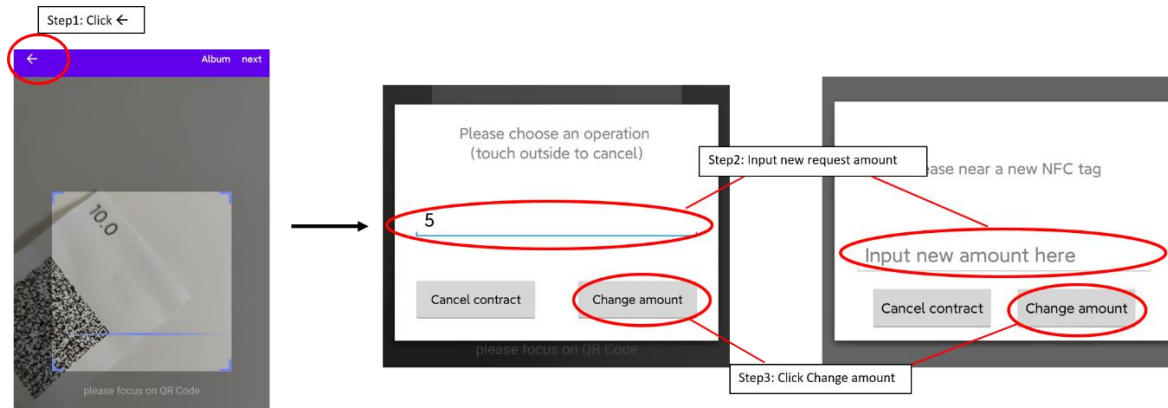
Different to 2.5, if the free money amount is larger than your request amount, you will **only get your request amount** after receiving that free money. The free money generator will get the **change back to his/her account balance**. For example, your request amount is 8.0, after receiving a 10.0 free money, your receiving process will finish and you only get 8.0. The 10.0 free money generator will get 2.0 back to his/her account balance. The 10.0 free money then gets expired.
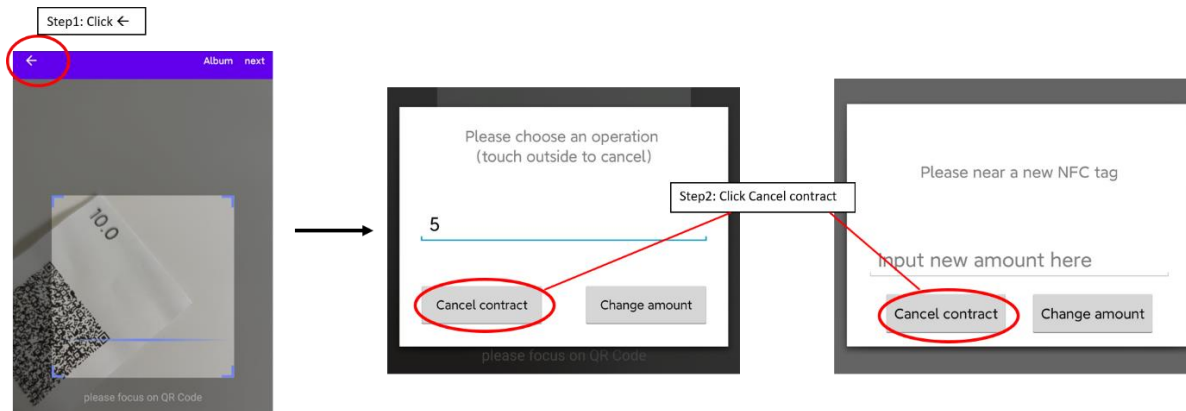
2.6.2 Change request amount
You can change the amount you want to receive during the receiving process. For example, you initially want to receive 15.0, after receiving a 5.0 free money, you can change the amount to 8.0. After receiving another 5.0 free money, your receiving process will finish and you will get 8.0. The second 5.0 free money generator, will get 2.0 free money back to his/her account balance. You can change the amount whenever scanning the QR part or reading the NFC tag.

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[11] If the amount if not enough, you will get a "not enough" notification and the app will open camera again

Step1: Click ←

Please choose an operation
(touch outside to cancel)

Step2: Input new request amount

...ase near a new NFC tag

5

Input new amount here

Cancel contract   Change amount

Cancel contract   Change amount

Step3: Click Change amount

2.6.3 Cancel requesting money

You can cancel the receiving process at any time. If you decide to cancel the transaction, you will **not receive any free money**, including the money you have received so far. The free money that has been scanned/read will get expired immediately and the amount will send back to its generator account balance. For example, Alice printed out a 5.0 free money, Bob requests Alice 10.0, After scanning Alice's 5.0 free money, Bob cancels the transaction, then Bob gets nothing and Alice gets her 5.0 back to her account.

Step1: Click ←

Please choose an operation
(touch outside to cancel)

Please near a new NFC tag

Step2: Click Cancel contract

5

Input new amount here

Cancel contract   Change amount

Cancel contract   Change amount

You **cannot** stop receiving money unless you have received enough money or you click the "Cancel contract" button.

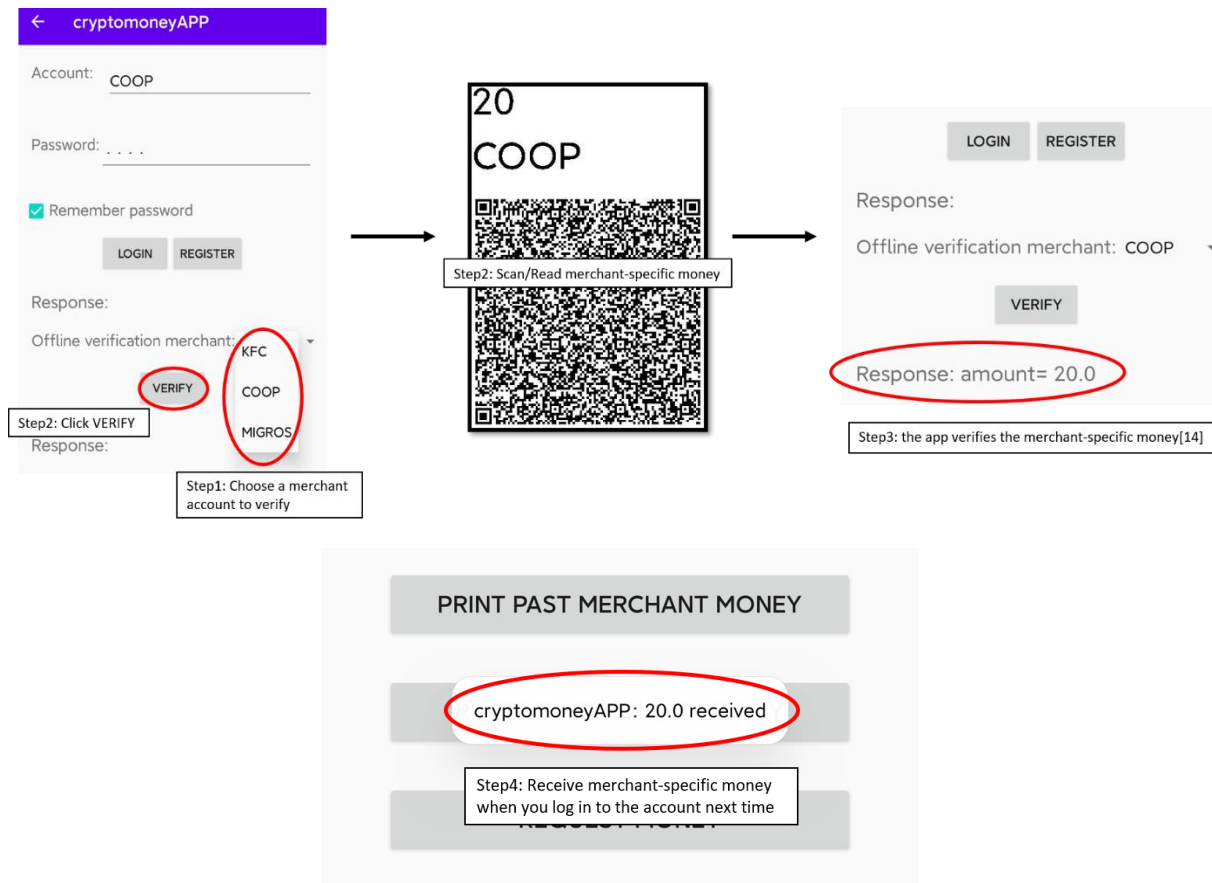## 2.7 Receive other's merchant-specific money (for merchant)

If you have a merchant account, you can verify and receive other's merchant-specific money if you are that specific receiver.

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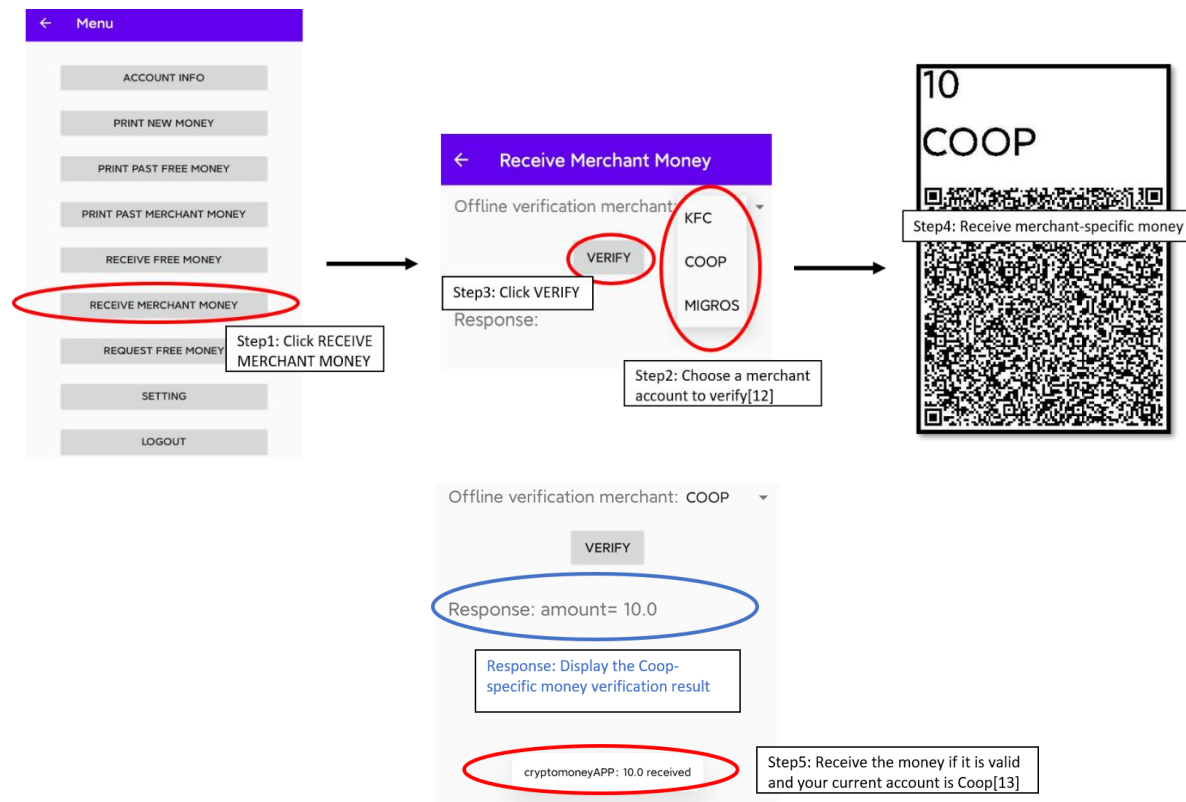
[12] The list will only show the merchants that you were able to log in in the past, if you are a customer, the list will be empty
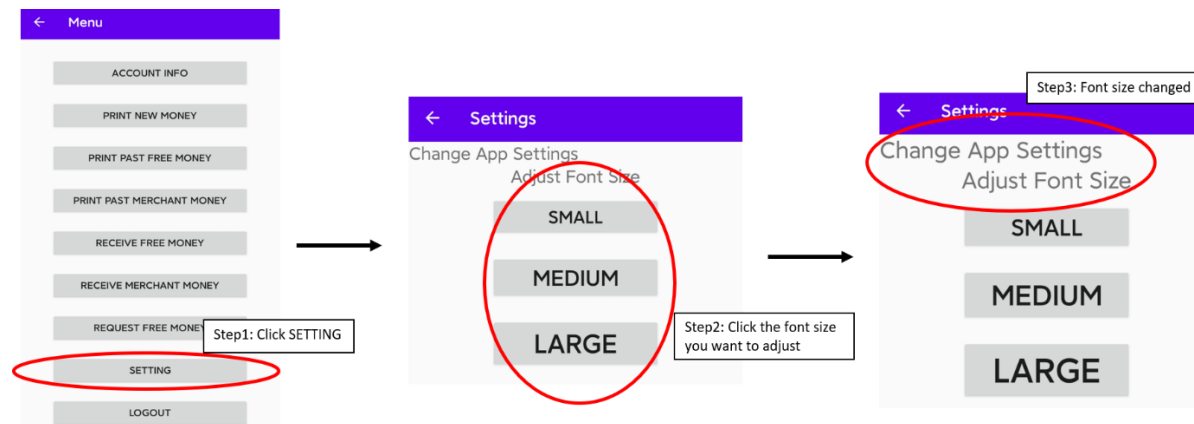[13] You **cannot** receive this money if you are not logged in as Coop now. You will receive the money the next time you log in Coop account

You can also verify a merchant-specific money **without Internet connection**.

Step2: Scan/Read merchant-specific money

Step2: Click VERIFY

Step1: Choose a merchant account to verify

Step3: the app verifies the merchant-specific money[14]

Step4: Receive merchant-specific money when you log in to the account next time

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[14] The app records all the merchant-specific money you have seen, you will **know if the money is expired** (has been received by you before) even if you are offline.

2.8 Adjust font size

Step1: Click SETTING

Step2: Click the font size you want to adjust

Step3: Font size changed

2.9 Log out your account

Step1: Click LOGOUT

Step2: Return to Login page