

## Problem Set 2

**Published:** Friday, June 20, 2025.

**Due: 23:59 PM, Friday, July 4, 2025.**

### Collaboration

You may collaborate with your Team members only. However, each student should write up and hand in his or her assignment separately. *Be sure to indicate with whom you have worked with in the comments of your submission.*

### **Before You Start: Read the Style Guide**

Read the style guide sections 1, 2, and 3. You should follow the conventions laid out in the [PEP 8 – Style Guide for Python Code](#)

Telestar, the company you work for as a software engineer, wants to implement some new functionalities to the mobile money service you helped create the last time. You have been recruited to work on implementing these new exciting services!

These new services will be implemented as functions, so first, you will have to modularize the existing service using functions in the format of the attached file named “momo\_application\_with\_functions.py”

The customers, with an initial amount of GHS 1000 and a 4-digit MOMO PIN “7209”, should be given the following options on the main menu when they dial the hashcode \*150#:

Welcome to Telestar Mobile Money! Please select an option:

- Transfer Money
- MOMO Pay
- Airtime and Bundles
- Allow Cash Out
- My Wallet

### **Part A: Transfer Money**

In the wake of increased mobile money scammers, Telestar wants to ensure customers have secure transactions. To do this, ensure that

- The MOMO number is verified before the transaction amount is input

- Transactions between Telestar network users registered to the MOMO service have user names displayed before transactions are authorized. The list of Telestar customers and their phone numbers to be used are in the “Telestar Customer List” excel file.
- the customer’s MOMO PIN is used to authorize the transactions

### Test Case 1

>>>

Enter your choice: 1

Transfer Money:

1. TeleStar Network

2. Other Networks

Enter your transfer choice: 1

Enter the recipient's TeleStar phone number (should start with 059): 05920979359

Verify the phone number by entering it again: 05920979359

Enter the amount to transfer: 50

Enter your MOMO pin to authorize transfer to ABASS, Osman: 7209

GHS 50.0 has been sent successfully to ABASS, Osman, with E-levy charge of GHS0.5

Service charge: GHS 0.2

New balance: GHS 949.2

Do you want to perform another operation? (yes/no):

### Part B: MOMO Pay Option

The added service charges that come with ordinary mobile money transactions make it an unsuitable option for transacting with businesses. This service, **MOMOPay**, allows customers to enter the Merchant ID associated with given ventures so payments can be made with no service charges. The vendor names and vendor (merchant) IDs to be used are in the “Merchant List” excel file.

### Test Case 2

>>>

Enter your choice: 2

MomoPay/Paybill:

Enter the 6-digit Merchant ID: 558032

Proceed to make payment to merchant, ALL IS WELL BAKERIES

Enter the amount to pay: 100

GHS 100.0 has been paid successfully to ALL IS WELL BAKERIES, with E-levy charge of GHS 1.0.

New balance: GHS 899.0

Do you want to perform another operation? (yes/no):

### Part C : Airtime and Bundles

Telestar wants to give customers more data bundles options outside of the available fixed ones. This will be made possible with the **Flexi\_Bundle** option. With this, a customer can purchase any amount of data for varying prices in the range, GHS 0 to GHS 400, given the following assumptions:

- The cost per each MB is 0.01786

- The amount of data you receive = Amount/Cost per MB plus a bonus of 5% the input amount.

### Test Case 3

>>>

Enter your choice: 3

Airtime and Bundles:

1. Buy Airtime

2. Buy Bundles

Enter your choice: 2

Bundles:

1. GHC 5 (280 MB)

2. GHC 10 (667 MB)

3. GHC 100 (10 GB)

4. Flexi-Bundle (GHS 0 - GHS 400)

Choose your bundle type: 4

Enter amount to purchase: 15

840.6 MB Data Bundle successfully purchased.

New balance: GHS 934.2

Do you want to perform another operation? (yes/no):

### Part D : Allow CashOut

To expedite cashouts, a new feature will be implemented: after a user initiates a cashout, a random vendor from the merchant list will prompt the user to cash out a random amount. Security is key, so the cashout prompt only goes through after the user authorizes it using their MOMO pin.

### Test Case 4

>>>

Enter your choice: 4

Allow CashOut:

1. Yes

2. No

Enter your choice: 1

Cashout for GHS82 to Evergreen Enterprise

Enter your MOMO PIN to authorize CashOut: 7209

Cash Out made for GHS 82.00 to Evergreen Enterprise. CashOut Fee GHS4.10 was charged automatically from your wallet.

Current Balance: GHS913.90

Do you want to perform another operation? (yes/no):

### Part F: My Wallet

In addition to the existing services provided by this option, the user should also be able access the following services :

- Wallet Top Up for updating their current balance
- MOMO pin change for when they think the pin is compromised
- Transaction history viewing for checking documentation of all their transactions so they conveniently have a high level understanding of the actions that are causing changes in their Mobile Money finances.

#### Test Case

>>>

Enter your choice: 6

My Wallet:

1. Top Up Balance
2. Check Balance
3. Change MoMo Pin
4. Transaction History

Enter your choice: 1

Enter amount to top up your balance: 50

Balance top up is successful. New balance: GHS 963.9

#### Test Case

>>>

Enter your choice: 6

My Wallet:

1. Top Up Balance
2. Check Balance
3. Change MoMo Pin
4. Transaction History

Enter your choice: 3

Enter your MoMo Pin: 7209

Enter your new 4-digit MoMo Pin: 7202

MOMO Pin successfully changed!

#### Test Case

>>>

Enter your choice: 6

My Wallet:

1. Top Up Balance
2. Check Balance
3. Change MoMo Pin
4. Transaction History

Enter your choice: 4

Transaction History:

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Timestamp : 2025-06-20 17:54:56

Type : Cash out

Amount (GHS) : 82.00

Charges (GHS) : 4.10

Balance After : 913.90

Status : Success

Recipient : Owner

---

Timestamp : 2025-06-20 18:04:53

Type : Account Topup

Amount (GHS) : 50.00

Charges (GHS) : 0.00

Balance After : 963.90

Status : Success

Recipient : Owner

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Do you want to perform another operation? (yes/no):