

Bright Money Assignment - Anand Kumar

(kumar.annu0010@gmail.com)

In order to run the project run the following commands:

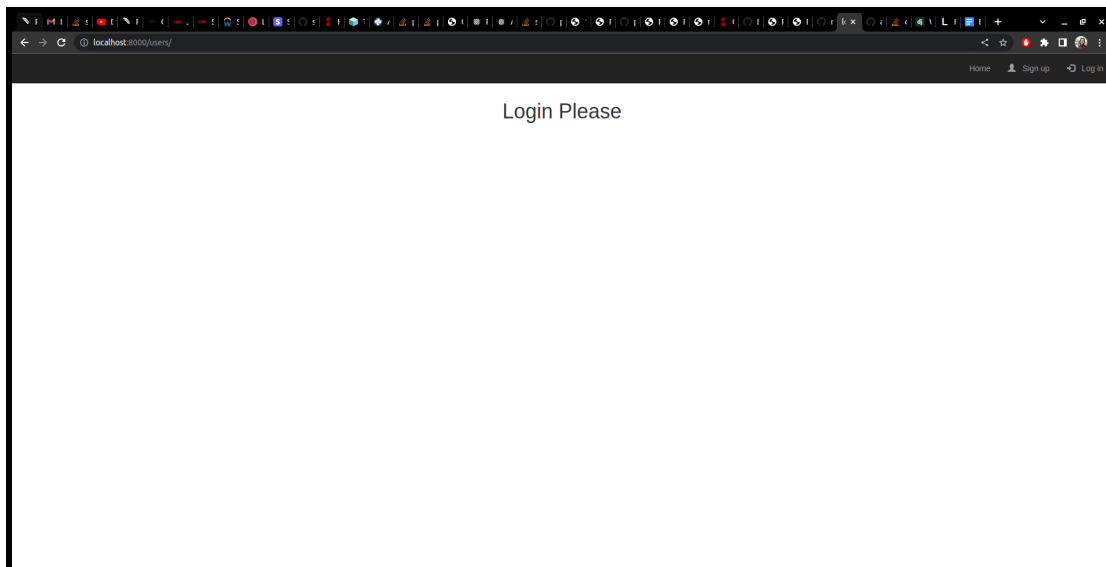
- 1) Create a virtual environment (using anaconda run **conda create -n plaidenv python=3.8** then activate using **conda activate plaidenv**)
- 2) Install dependencies by running **pip install -r requirements.txt**
- 3) **python manage.py makemigrations**
- 4) **python manage.py migrate**
- 5) **python manage.py runserver**
- 6) The website will be available at <http://localhost:8000/users/>

Following are the different steps involved in the project:

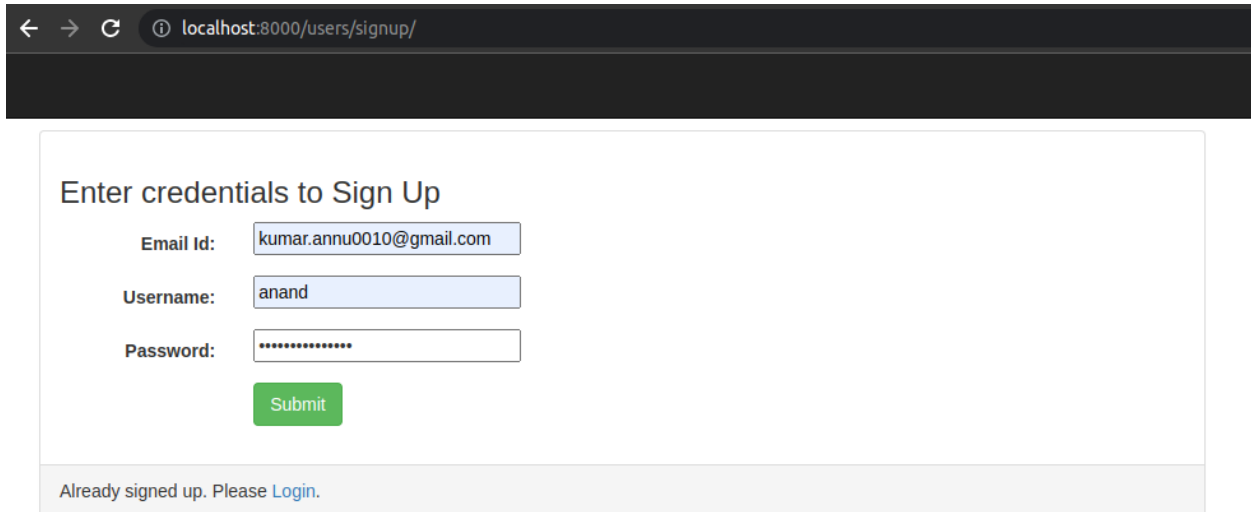
Step 1: Registering users

Created a class in **models.py** called **Users** with fields **username**, **password**, **email**, **is_logged_in**, **access_tkn** and **item_id** all of datatype character

Renders the **index.html**.



As a new user, click on signup. It renders signup.html and calls the action register in **views.py**.



Enter credentials to Sign Up

Email Id:

Username:

Password:

Already signed up. Please [Login](#).

register(request) gets the username, password, and email_id from the POST request from the HTML page.

Most API calls to Plaid endpoints require an access_token. An access_token provides access to a specific *Item*, which is a Plaid term for a login at a financial institution. To get the access_token we first need to generate a public key for the session.

This can be done by creating a client object of plaid and determining the institute id, and list of allowed products like transaction, balance, etc.

```
INSTITUTION_ID = 'ins_1' # The ID of the institution the Item will be
                        # associated with
# Creating client
client = Client(client_id=PLAID_CLIENT_ID, secret=PLAID_SECRET_KEY,
                environment=PLAID_ENV)
# Creating public token
res = client.Sandbox.public_token.create(
    INSTITUTION_ID,
    ['transactions'],
    webhook='https://sample-webhook-uri.com' # Expose a webhook for item
)
Return res['public_token']
```

Now we have the public token we can use this information to receive the access token and item_id to perform any Plaid API operation. We can use the legacy code to retrieve

the same. We are exposing a webhook for handling plaid transaction updates and fetch the transactions on receipt of a webhook on website='https://sample-webhook-uri.com'

To get the access token and item_id we run the following code:

```
response = client.Item.public_token.exchange(public_token)
access_tkn = response['access_token']
item_id = response['item_id']
```

Now we have the access token and item id. We can associate these credentials with the user for validation and store it in db along with other credentials that are email, username, and password. Thus the register API ends by storing the credentials in DB and `template.render`.

Step 2: Login Validation

In this step basically the user will have to input the username and password.

There is a validation function in `views.py` which gets the fields value. Then we check if the credentials are found in the db. If yes then we set **is_logged_in** of User **object = True**, and go to the profile page.

Else we raise a message with incorrect credentials and reload the login page.

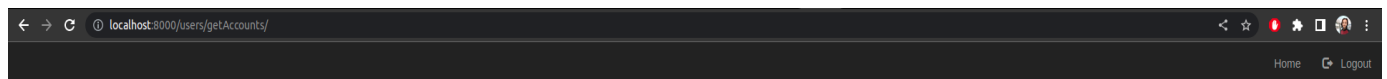
Step 3: Get Transaction and Account Detail

Currently 3 APIs have been integrated into the project.

Transactions Data: Using the access token, we can specify the start date and end date between whose all transactions we want to get.

```
response = client.Transactions.get(access_tkn,  
                                   start_date='2021-09-25',  
                                   end_date='2021-10-25')
```

The response will return us 5 keys in JSON format - **'accounts', 'item', 'request_id', 'total_transactions', 'transactions'**. To get the transaction data we can simply return **response["transactions"]**.



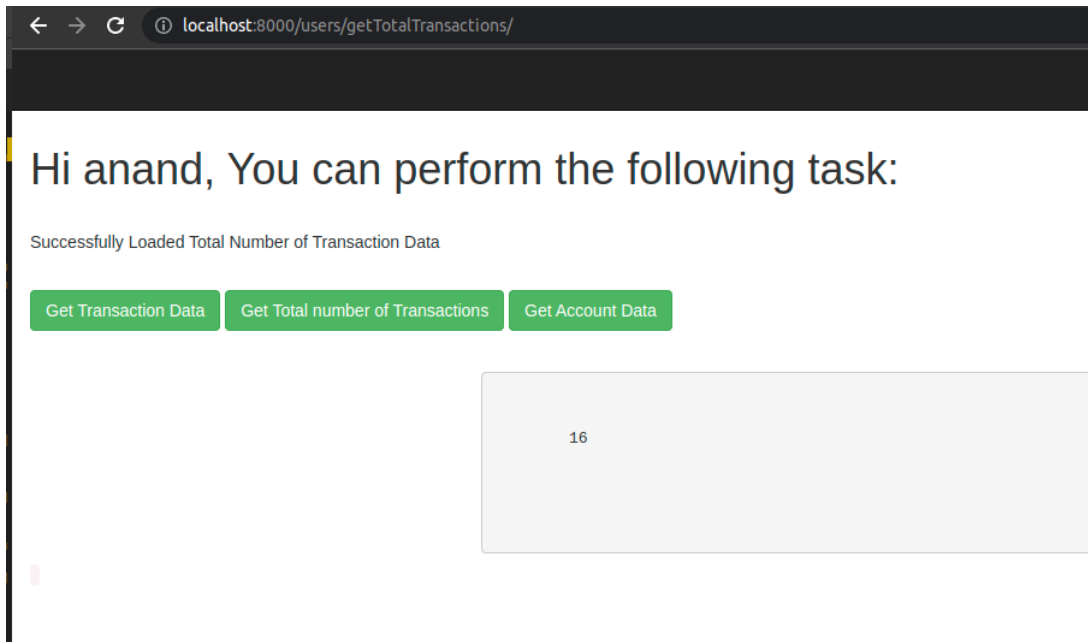
Hi anand, You can perform the following task:

Successfully Loaded Account Data

Get Transaction Data Get Total number of Transactions Get Account Data

```
{  
  "accounts": [  
    {  
      "account_id": "g8Rm068P9Rnqa8DelebQf1MKzm6BoiPQgXrp",  
      "balances": {  
        "available": 100,  
        "current": 110,  
        "iso_currency_code": "USD",  
        "limit": None,  
        "unofficial_currency_code": None,  
        "mask": "9000",  
        "name": "Plaid Checking",  
        "official_name": "Plaid Gold Standard 0% Interest Checking",  
        "subtype": "checking",  
        "type": "depository",  
        "account_id": "ygPkWdRjMqP56grzjVj4tyZ96VrPZtobyQnz",  
        "balances": {  
          "available": 200,  
          "current": 210,  
          "iso_currency_code": "USD",  
          "limit": None,  
          "unofficial_currency_code": None,  
          "mask": "1111",  
          "name": "Plaid Saving",  
          "official_name": "Plaid Silver Standard 0.1% Interest Saving",  
          "subtype": "savings",  
          "type": "depository",  
          "account_id": "9ebRjJxdrbc8WZia6aw4UWj39pDNAj1kwRmym",  
          "balances": {  
            "available": None,  
            "current": 1000,  
            "iso_currency_code": "USD",  
            "limit": None,  
            "unofficial_currency_code": None,  
            "mask": "2222",  
            "name": "Plaid CD",  
            "official_name": "Plaid Bronze Standard 0.2% Interest CD",  
            "subtype": "cd",  
            "type": "depository",  
            "account_id": "vLagvJ4Mxahlw3R4a4kxH6GpKwX3b6FgBwDe3",  
            "balances": {  
              "available": None,  
              "current": 410,  
              "iso_currency_code": "USD",  
              "limit": 2000,  
              "unofficial_currency_code": None,  
              "mask": "3333",  
              "name": "Plaid Credit Card",  
              "official_name": "Plaid Diamond 12.5% APR Interest Credit Card",  
              "subtype": "credit card",  
              "type": "credit",  
              "account_id": "RP7wqARQ37UvLZP9M5a9SxpB64zm5puwARQKk",  
              "balances": {  
                "available": 43200,  
                "current": 43200,  
                "iso_currency_code": "USD",  
                "limit": None,  
                "unofficial_currency_code": None,  
                "mask": "4444",  
                "name": "Plaid Money Market",  
                "official_name": "Plaid Platinum Standard 1.85% Interest Money Market",  
                "subtype": "money market",  
                "type": "depository",  
                "account_id": "6Panp4ze1AU3G123V3rWpLN8wXl0lCmpgRK6",  
                "balances": {  
                  "available": None,  
                  "current": 320.76,  
                  "iso_currency_code": "USD",  
                  "limit": None,  
                  "unofficial_currency_code": None,  
                  "mask": "5555",  
                  "name": "Plaid IRA",  
                  "official_name": None,  
                  "subtype": "ira",  
                  "type": "investment",  
                  "account_id": "XWLBxRagPLUqK3E1eIn9tn eaxv4J6eF9WdRjX",  
                  "balances": {  
                    "available": None,  
                    "current": 23631.9805,  
                    "iso_currency_code": "USD",  
                    "limit": None,  
                    "unofficial_currency_code": None,  
                    "mask": "6666",  
                    "name": "Plaid 401k",  
                    "official_name": None,  
                    "subtype": "401k",  
                    "type": "investment",  
                    "account_id": "DwInJGm17ltdnAr5k5BqtnbrZL6dvbF7Bv8Rw",  
                    "balances": {  
                      "available": None,  
                      "current": 65262,  
                      "iso_currency_code": "USD",  
                      "limit": None,  
                      "unofficial_currency_code": None,  
                      "mask": "7777",  
                      "name": "Plaid Student Loan",  
                      "official_name": None,  
                      "subtype": "student",  
                      "type": "loan",  
                      "account_id": "VQMZBmxa4Mfa v2o5J5xQixEr4Kn8XEioWJyk",  
                      "balances": {  
                        "available": None,  
                        "current": 56302.06,  
                        "iso_currency_code": "USD",  
                        "limit": None,  
                        "unofficial_currency_code": None,  
                        "mask": "8888",  
                        "name": "Plaid Mortgage",  
                        "official_name": None,  
                        "subtype": "mortgage",  
                        "type": "loan"}  
                    }  
                  }  
                }  
              }  
            }  
          }  
        }  
      }  
    ]  
  },  
  "item": {  
    "request_id": "g8Rm068P9Rnqa8DelebQf1MKzm6BoiPQgXrp",  
    "total_transactions": 100  
  },  
  "request_id": "g8Rm068P9Rnqa8DelebQf1MKzm6BoiPQgXrp",  
  "total_transactions": 100  
}
```

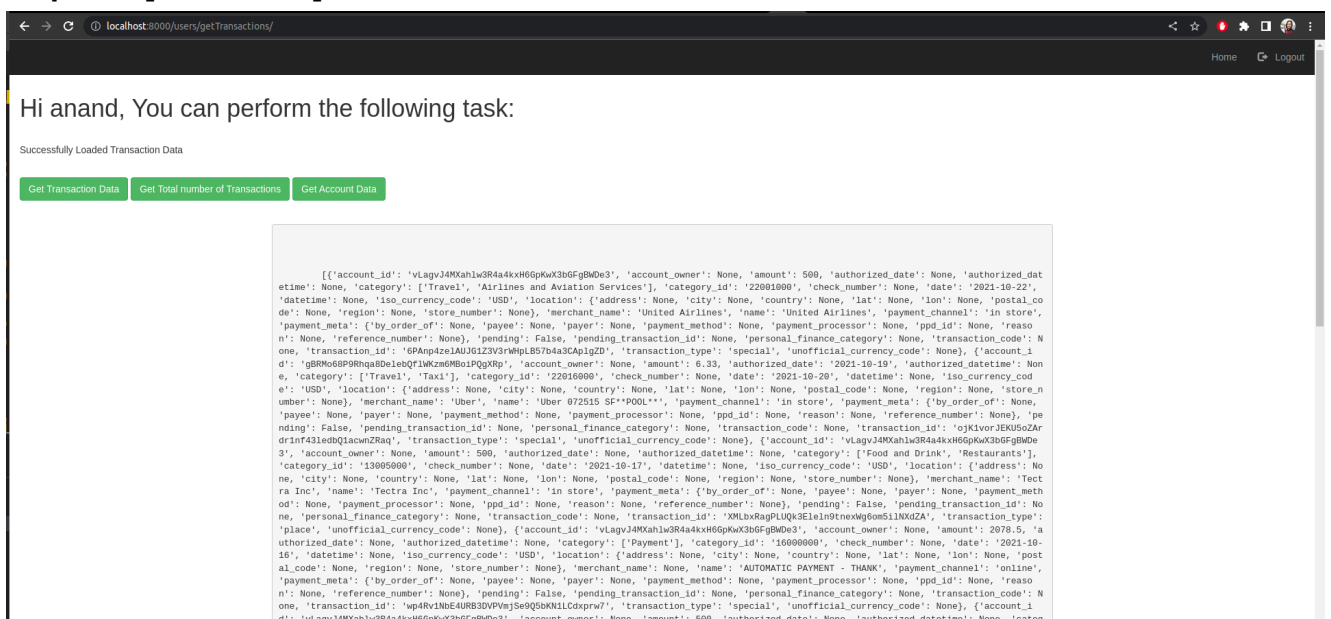
Total Number of Transactions: To get the total number of transactions we can simply return **response['total_transactions']**.



Account Data: Inorder to get the account data Plaid have an API for the same.

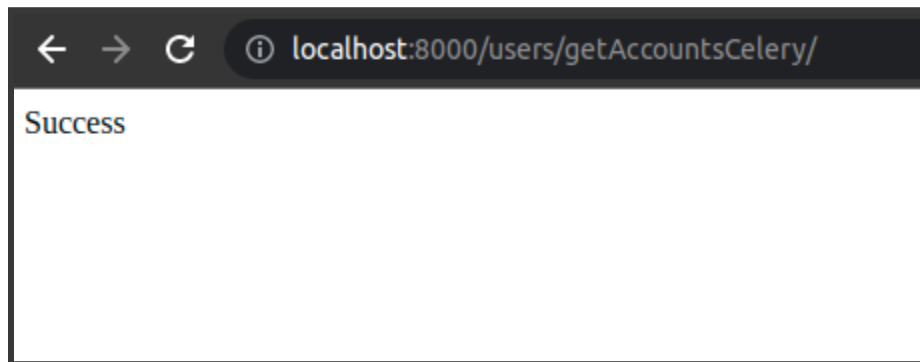
```
response = client.Accounts.balance.get(access_tkn,
                                     start_date='2021-09-25',
                                     end_date='2021-10-25')
```

The response will return 3 keys - 'accounts', 'item', 'request_id', we can return **response['accounts']**



Step 4: Using celery for Asynchronous Task

We are using redis as the broker at port 6379. We create a task in task.py where we are getting the Accounts Data. An API is exposed with path getAccountsCelery. When it is called the access token is passed to the task and it gets the accountData, and returns Success.



When API is called the task is run via celery.

```
(plaidnew) pipebomb@pipebomb-Strix-15-GL503GE:~/Desktop/bright_money_assignment$ celery inspect registered
-> celery@pipebomb-Strix-15-GL503GE: OK
* MyApp.tasks.get_access_token
* MyApp.tasks.get_accounts
* MyApp.tasks.get_transactions
```

It shows the list of registered tasks.

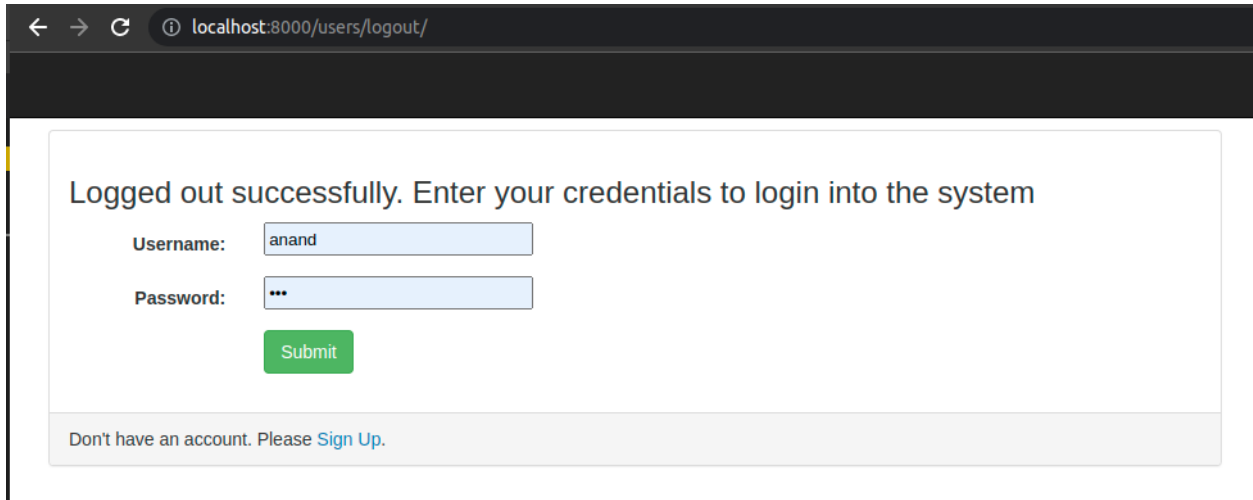
```
PROBLEMS 13 OUTPUT TERMINAL JUPYTER DEBUG CONSOLE
4zm5puwRQKk', 'balances': {'available': 43200, 'current': 43200, 'iso_currency_code': 'USD', 'limit': None, 'unofficial_currency_code': None}, 'mask': '4444', 'name': 'Plaid M
oney Market', 'official_name': 'Plaid Platinum Standard 1.85% Interest Money Market', 'subtype': 'money market', 'type': 'depository'}, {'account_id': '6PAnp4zeLAUJG1Z3V3rWHPn
Bwx1blCmpgRK6', 'balances': {'available': None, 'current': 320.76, 'iso_currency_code': 'USD', 'limit': None, 'unofficial_currency_code': None}, 'mask': '5555', 'name': 'Plaid
IRA', 'official_name': None, 'subtype': 'ira', 'type': 'investment'}, {'account_id': 'XHLbxRagPLUQ3ELeIn9neaxv4J6eF9NdRjX', 'balances': {'available': None, 'current': 23631.9
805, 'iso_currency_code': 'USD', 'limit': None, 'unofficial_currency_code': None}, 'mask': '6666', 'name': 'Plaid 401k', 'official_name': None, 'subtype': '401k', 'type': 'inve
stment'}, {'account_id': 'DWLnJGh17ltdnAr5K5BqtnbrZL6DvbF7Bv8Rw', 'balances': {'available': None, 'current': 65262, 'iso_currency_code': 'USD', 'limit': None, 'unofficial_curre
ncy_code': None}, 'mask': '7777', 'name': 'Plaid Student Loan', 'official_name': None, 'subtype': 'student', 'type': 'loan'}, {'account_id': 'VQMZBmxa4MFavZo5J5xQ1xEr4Kn8XEioXW
JyK', 'balances': {'available': None, 'current': 56302.06, 'iso_currency_code': 'USD', 'limit': None, 'unofficial_currency_code': None}, 'mask': '8888', 'name': 'Plaid Mortgage
', 'official_name': None, 'subtype': 'mortgage', 'type': 'loan'}}
[2022-10-03 23:05:21,829: INFO/ForkPoolWorker-1] Task users.tasks.getAccountsCelery[685dbb05-95b0-4186-b400-9ef6651330c] succeeded in 17.66394699900411s: 'Successfully return
Account Data'
[2022-10-03 23:05:26,703: WARNING/ForkPoolWorker-8] Account DATA
[2022-10-03 23:05:26,704: WARNING/ForkPoolWorker-8] [{"account_id": "gBRM066P9RhqaBdelebQfLWkzm6MBoiPQgXRp", "balances": {"available": 100, "current": 110, "iso_currency_code":
"USD", "limit": None, "unofficial_currency_code": None}, "mask": "0000", "name": "Plaid Checking", "official_name": "Plaid Gold Standard 0% Interest Checking", "subtype": "che
cking", "type": "depository"}, {"account_id": "vgPkwRjMqP56grzjVj04tyZ96VRrPZtobyQnz", "balances": {"available": 200, "current": 210, "iso_currency_code": "USD", "limit": None,
"unofficial_currency_code": None}, "mask": "1111", "name": "Plaid Saving", "official_name": "Plaid Silver Standard 0.1% Interest Saving", "subtype": "savings", "type": "deposi
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code": None}, "mask": "2222", "name": "Plaid CD", "official_name": "Plaid Bronze Standard 0.2% Interest CD", "subtype": "cd", "type": "depository"}, {"account_id": "vLagvJ4MXa
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4zm5puwRQKk", "balances": {"available": 43200, "current": 43200, "iso_currency_code": "USD", "limit": None, "unofficial_currency_code": None}, "mask": "4444", "name": "Plaid M
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Bwx1blCmpgRK6", "balances": {"available": None, "current": 320.76, "iso_currency_code": "USD", "limit": None, "unofficial_currency_code": None}, "mask": "5555", "name": "Plaid
IRA", "official_name": None, "subtype": "ira", "type": "investment"}, {"account_id": "XHLbxRagPLUQ3ELeIn9neaxv4J6eF9NdRjX", "balances": {"available": None, "current": 23631.9
805, "iso_currency_code": "USD", "limit": None, "unofficial_currency_code": None}, "mask": "6666", "name": "Plaid 401k", "official_name": None, "subtype": "401k", "type": "inve
stment"}, {"account_id": "DWLnJGh17ltdnAr5K5BqtnbrZL6DvbF7Bv8Rw", "balances": {"available": None, "current": 65262, "iso_currency_code": "USD", "limit": None, "unofficial_curre
ncy_code": None}, "mask": "7777", "name": "Plaid Student Loan", "official_name": None, "subtype": "student", "type": "loan"}, {"account_id": "VQMZBmxa4MFavZo5J5xQ1xEr4Kn8XEioXW
JyK", "balances": {"available": None, "current": 56302.06, "iso_currency_code": "USD", "limit": None, "unofficial_currency_code": None}, "mask": "8888", "name": "Plaid Mortgage
", "official_name": None, "subtype": "mortgage", "type": "loan"}}
[2022-10-03 23:05:26,705: INFO/ForkPoolWorker-8] Task users.tasks.getAccountsCelery[38590c0f-5eef-45d9-8335-8ec7f8091e27] succeeded in 27.92691244099842s: 'Successfully return
Account Data'
[2022-10-03 23:05:28,083: INFO/MainProcess] Received task: users.tasks.test_func[cb2b0975-d4bd-4d34-a46b-051850b27a7a]
```

To keep track of celery we can run `celery -A mainApp worker -l info`

We can see all the current processes and their output. The above prints all the accountData details when the getAccountsCelery task is called.

Step 5: Logout

You can click on the logout button on the top right corner to logout. It will render the login page again.



The screenshot shows a web browser window with the address bar displaying 'localhost:8000/users/logout/'. The main content area has a dark header bar. Below it, a white box contains the message 'Logged out successfully. Enter your credentials to login into the system'. This is followed by a login form with two input fields: 'Username:' with the value 'anand' and 'Password:' with three dots. A green 'Submit' button is below the password field. At the bottom of the white box, a light gray bar contains the text 'Don't have an account. Please [Sign Up](#)'.

Security of Credentials

The PLAID client ID, Secret Key and environment are stored as environment variables. These values are exported in bashrc script, and are loaded in the main folder settings.py file using os.getenv.

```
PLAID_CLIENT_ID = os.getenv('PLAID_CLIENT_ID')
PLAID_SECRET_KEY = os.getenv('PLAID_SECRET_KEY')
PLAID_ENV = os.getenv('PLAID_ENV')
```