

## APPENDICES

### SOURCE CODE HEIRARCHY

The code has a layout of:

```
1 capstone/
2 |--rfid/
3 |   |--main.cpp
4 |--src/
5 |   |--__init__.py
6 |   |--bin/
7 |   |   |--__init__.py
8 |   |   |--access.py
9 |   |   |--code_email.py
10 |   |--misc/
11 |   |   |--__init__.py
12 |   |   |--colors.py
13 |   |--system/
14 |   |   |--utils/
15 |   |   |   |--password_gen.py
16 |   |   |   |--update.py
17 |   |   |--.bashrc
18 |   |   |--pre_setup.sh
19 |   |   |--user_setup.sh
20 |   |--cli.py
21 |   |--face_recog.py
22 |   |--function.py
23 |   |--main.py
24 |--test_faces/
25 |   |--biden1.jpg
26 |   |--biden2.jpg
27 |   |--f0.jpg
28 |   |--f1.jpg
29 |   |--f2.jpg
30 |   |--f3.jpg
31 |   |--f4.jpg
32 |   |--f5.jpg
33 |   |--f6.jpg
34 |   |--f7.jpg
35 |   |--f8.jpg
36 |   |--f9.jpg
37 |   |--obama1.jpg
38 |   |--obama2.jpg
39 |--sample/
40 |   |--test1.png
41 |   |--test2.jpg
42 |   |--test2.png
43 |--README.md
44 |--command_logs
45 |--logs
46 |--requirements.txt
47 |--.gitignore
```

The main folder is capstone, hosted on GitHub with repository link of: <https://github.com/testno0/capstone>.

It is also made up of several branches for development of each feature and function, which are: (1.) main as the main branch; (2.) devel for further development of new features introduced in their temporary branch; (3.) cli for integration of commandline interface (CLI); (4.) test-v1-beta as a beta testing branch for each new features introduced before

merging with devel; (5.) `face_recog` for introduction of face recognition algorithms; (6.) `pep8-adaptation` for shifting of coding style to Python Enhancement Proposal (PEP) 8; (7.) `pep8-ch-test` for testing of changes in `pep8-adaptation`, since there are possibilities that the changes cause code failure; (9.) and lastly `v1.0`, for the final version.

The folder `rfid/` contains the source code for Arduino in locker system, while the folder `src/` contains the code for face recognition system. And `test_faces/` and `samples/` contains the faces for initial testing, and live testing, respectively.

## Installation

The product of this project is a working-out-of-the-box program in a plug-and-play USB A stick for boot in most of systems. However, for redeployment, or perhaps a reinstallation, the program can be easily configured with the following steps.

Clone the repository with `git`:

```
1 git clone https://github.com/testno0/capstone
```

And change the permission of the setup script with `chmod +x $HOME/capstone/src/system/pre_setup.sh` and execute it with `./$HOME/capstone/src/system/pre_setup.sh` or skip the setups and do `bash $HOME/capstone/src/system/pre_setup.sh`.

The setup script would then automatically automate the other processes, including the user setup, but would later prompt input from user for necessary information.

## RFID locker

```
1 #include <LiquidCrystal_I2C.h>
2 #include <SPI.h>
3 #include <MFRC522.h>
4
5 #define SS_PIN 10
6 #define RST_PIN 9
7
8 String UID = "43 12 9F 94", UID_2 = "B3 E5 F 95";
9 bool lock = true, check;
10
11 Servo servo;
12 LiquidCrystal_I2C lcd(0x27, 20, 4);
13 MFRC522 rfid(SS_PIN, RST_PIN);
14
15
16 void lcd_print(String message, int x, int y, bool clear) {
```

```

17     if (clear == true) {
18         lcd.clear();
19     }
20
21     lcd.setCursor(x, y);
22     lcd.print(message);
23
24 }
25
26 bool checker(bool init_) {
27     if (init_ == true) {
28         if ( ! rfid.PICC_IsNewCardPresent() || ! rfid.PICC_READ_CARD_SERIAL()) {
29             return false;
30         }
31     } else {
32         if ( ! rfid.PICC_IsNewCardPresent() || ! rfid.PICC_READ_CARD_SERIAL()) {
33             return false;
34         } else {
35             return true;
36         }
37     }
38 }
39
40
41
42 void setup() {
43     Serial.begin(9600);
44     servo.write(70);
45     lcd.init();
46     lcd.backlight();
47     servo.attach(3);
48     SPI.begin();
49     rfid.PCD_Init();
50
51 }
52
53 void loop() {
54     lcd_print("Welcome!", 6, 1, false);
55     lcd_print("Please scan the card", 0, 2, false);
56     check = checker();
57
58     if (check == false) {
59         return;
60     }
61
62
63     lcd_print("Scanning", 0, 0, true);
64     lcd_print("Please wait", 0, 1, false);
65     Serial.print("UID tag is: ");
66
67     String ID = "";
68     for (byte i = 0; i < rfid.uid.size(); i++) {
69         lcd.print(".");
70         ID.concat(String(rfid.uid.uidByte[i] < 0x10? " 0" : " "));
71         ID.concat(String(rfid.uid.uidByte[i], HEX));
72         delay(300);
73     }
74
75     ID.toUpperCase();
76
77
78
79     // start rfid card recognition
80     if (ID.substring(1) == UID || ID.substring(1) == UID_2) {
81         servo.write(160);
82         lock = false;
83
84         while (lock != true) {
85             if (lock == false) {
86                 break;
87             }
88         }
89

```

```

90         lcd_print("Door opened.", 4, 1, true);
91         delay(1500);
92         check_2 = checker();
93         if (check == true) {
94             lock = false;
95             servo.write(70);
96             continue;
97         }
98     }
99 }
100 }
101 } else {
102     lcd_print("Access denied.", 4, 1, true);
103 }
104 }
105 }
106 }

```

Listing 1: C++ code of the RFID locker

## RFID-based attendance system

The code has a layout of, where as `bin/` contains the modules for execution of `main.py`, `misc/` less unimportant module, `system/` contains the utilities of the program as well as the setup scripts.

```

1  '--src/
2  |  '--__init__.py
3  |  '--bin/
4  |  |  '--__init__.py
5  |  |  '--access.py
6  |  |  '--code_email.py
7  |  '--misc/
8  |  |  '--__init__.py
9  |  |  '--colors.py
10 |  '--system/
11 |  |  '--utils/
12 |  |  |  '--password_gen.py
13 |  |  |  '--update.py
14 |  |  '--.bashrc
15 |  |  '--pre_setup.sh
16 |  |  '--user_setup.sh
17 |  '--cli.py
18 |  '--face_recog.py
19 |  '--function.py
20 |  '--main.py
21 ...

```

`--init__.py` is a file used to declare the directory as a regular packages, as suggested by Python Documentation (2022). While the `./misc/` directory is a regular package for `colors.py` to distinguish the `stdout` and `stdin` of the program from other `stderr`.

## System Setup

Since the device aims to be easily deployable, and easy to use. The project authors decided to device a setup script written in `shell`, since this is mainly for `*NIX` systems. First was

the `pre_setup.sh` for system setup, which would be executed after permission change with command of: `chmod +x pre_setup.sh`.

```
1 # system upgrade: #? pass
2 echo -e "\e[1;32m> Starting full system upgrade to fix CVE vulnerabilities ...\e[0m\nKindly input the
   current password : 'root' (no quotations) when prompted, and don't let the system die."
3 sudo dnf update -y
4
5 # check for system utilities: #? likely passing
6 echo -e "\e[1;32m> Checking the presence of git, installing if not installed ...\e[0m"
7 git_check=$(dnf list installed | grep -i "git")
8 if [[ $git_check != *"git"* ]]; then
9     echo -e "\e[1;32m> Installing git in the system ...\e[0m"
10    sudo dnf install git -y
11 fi
12
13 # install pip if not installed: #? likely passing
14 echo -e "\e[1;32m> Checking the presence of python.pip, installing if not installed ...\e[0m"
15 pip_check=$(dnf list installed | grep "python3-pip")
16 if [[ $pip_check != *"python3-pip"* ]]; then
17     echo -e "\e[1;32m> Installing python3-pip in the system ...\e[0m"
18     sudo dnf install python3-pip -y
19 fi
20
21 echo -e "\e[1;32m> Checking the presence of cmake, installing if not installed ...\e[0m"
22 cmake_check=$(dnf list installed | grep -i "cmake[^\-]*")
23 if [[ $cmake_check != *"cmake"* ]]; then
24     echo -e "\e[1;32m> Installing python3-pip in the system ...\e[0m"
25     sudo dnf install cmake -y
26 fi
27
28 echo -e "\e[1;32m> Checking the presence of cmake, installing if not installed ...\e[0m"
29 dlib_check=$(dnf list installed | grep -i "python.-dlib")
30 if [[ $dlib_check != *"python3-dlib"* ]]; then
31     echo -e "\e[1;32m> Installing python3-pip in the system ...\e[0m"
32     sudo dnf install python3-dlib -y
33 fi
34
35 # install required packages: #? likely passing
36 echo -e "\e[1;31m> Installing required packages ...\e[0m"
37 pip install -r $HOME/capstone/requirements.txt
38
39 # setup a systemd service for repository check : #! FAILED
40 echo -e "\e[1;32m> Setting up a systemd service ...\e[0m"
41 sudo touch /etc/systemd/system/repository-check.service
42 echo -e "[Unit]\nDescription=Check the repository for updates every 24 hours.\nAfter=network.target\n
   StartLimitIntervalSec=5\n\n[Service]\nType=simple\nRestart=always\nRestartSec=5\nUser=\"%u\"\n
   ExecStart=/usr/bin/env python \"%h\"/repository/bin/service.py'\n\n[Install]\nWantedBy=multi-user.
   target" | sudo tee -a /etc/systemd/system/repository-check.service
43
44 # replaced with "specifiers" as described from systemd documentation, refer to: https://www.freedesktop.
   org/software/systemd/man/systemd.unit.html#Specifiers
45
46
47
48 #! FAILED
49
50 sudo systemctl daemon-reload
51 sudo systemctl enable repository-check.service
52
53 # setup the dirs
54 mkdir -P $HOME/.att_sys/bak
55
56 cp --recursive $HOME/capstone/src -t $HOME/.att_sys
57 mv -recursive $HOME/capstone -t $HOME/.att_sys/bak
58
59 # move the binaries: #? likely passing
60 # main binaries@$HOME/.att_sys/bin/
61 # cp $HOME/capstone/src/bin/*.py $HOME/.att_sys/bin/
62
63 # algorithm@$HOME/.att_sys/algorithm/
```

```

64 # cp $HOME/capstone/src/*.py $HOME/.att_sys/
65
66 # utils@$HOME/.att_sys/system/utils
67 # cp $HOME/capstone/src/system/utils/*.py $HOME/.att_sys/system/utils
68 # download the setup script instead of moving it
69 # pre setup script
70 # wget https://raw.githubusercontent.com/testno0/capstone/devel/src/system/pre_setup.sh -P $HOME/.
    att_sys/system/
71 # user setup script
72 # wget https://raw.githubusercontent.com/testno0/capstone/devel/src/system/user_setup.sh -P $HOME/.
    att_sys/system/
73
74 # misc@$HOME/.att_sys/misc
75 # cp $HOME/capstone/src/misc/*.py $HOME/.att_sys/misc
76 # cp $HOME/capstone/requirements.txt $HOME/.att_sys/
77
78 # remove the old bashrc
79 rm $HOME/.bashrc
80 wget https://raw.githubusercontent.com/testno0/capstone/devel/src/system/.bashrc -P $HOME/
81 source $HOME/.bashrc
82
83 chmod -R +x $HOME/.att_sys/system/*.sh
84 ./ $HOME/.att_sys/system/user_setup.sh

```

Listing 2: `pre_setup.sh` for system setup on rpm-based Linux distributions.

The script is mainly an automatic to perform system update, as well as installation of important packages such as `git` for repository access, `cmake` and `python3-dlib` as dependencies of dependencies in `requirements.txt`, specifically by `face_recognition` module, and `python3-pip` was then used for installation of python dependencies. It also includes the automated installation of program dependencies, and setup of the `systemd` service, to be able to schedule the use of the module to avoid memory leak and overuse:

```

1 [Unit]
2 Description=Check the repository for updates every 24 hours.
3
4 [Service]
5 Type=simple
6 ExecStart=python ~/repository/bin/service.py
7
8 [Install]
9 WantedBy=multi-user.target

```

Listing 3: `systemd` service written to intercept pull an update to repository every 24 hours.

After the setup of `systemd` service, the source code was then moved into `$PATH` defined in `.bashrc`. Whereas the `.bashrc`, also mentioned in line 79, 80, and 81, is the modified BASH configuration from default of Fedora Linux 35, that contains:

```

1 # .bashrc
2
3 # Source global definitions
4 if [ -f /etc/bashrc ]; then
5     . /etc/bashrc
6 fi
7
8 # User specific environment
9 if ! [[ "$PATH" =~ "$HOME/.local/bin:$HOME/bin:" ]]

```

```

10 then
11     PATH="$HOME/.local/bin:$HOME/bin:$PATH"
12 fi
13 export PATH
14
15 # Uncomment the following line if you don't like systemctl's auto-paging feature:
16 # export SYSTEMD_PAGER=
17
18 # User specific aliases and functions
19 if [ -d ~/.bashrc.d ]; then
20     for rc in ~/.bashrc.d/*; do
21         if [ -f "$rc" ]; then
22             . "$rc"
23         fi
24     done
25 fi
26
27 PS1="\u@\h:\w $"
28 export PS1
29
30 PROMPT_DIRTRIM=2
31
32 alias taptap="python $HOME/.att_sys/cli.py"
33
34 unset rc

```

Listing 4: .bashrc

And finally, for the last phase of the system setup, is the user setup, this includes the collection of details, for use of the Python modules, this includes email address for messages, name, the name of the school, and the creation of 32 character (*pseudo-random*) ASCII string passphrase, using `./utils/password_gen.py`:

```

1 # test 1: /* passed!
2
3 if [ ! -d "$HOME/.att_sys/" ]; then
4     # user information setup : /* pass
5     echo -e "\e[1;32m> User setup ...\e[0m"
6
7     # take the username and email of the user
8     echo -e "\e[1m> This information is to be used in database, kindly use correct punctuation.\e[0m"
9     read -p "> Enter the email for access codes and reports: " email
10    read -p "> Enter the username: " user_name
11    read -p "> Enter the school name: " school_name
12
13    # generate user password
14    password=$(python $HOME/.att_sys/system/utils/password_gen.py)
15    echo -e "\e[1;32m> Your password is: $password"
16
17    # append user information and password to a file
18    echo -e "\e[1;32m> Appending user info ...\e[0m"
19    echo -e "$email\n$user_name\n$password\n$school_name" > $HOME/.att_sys/user_info
20
21    python $HOME/.att_sys/system/utils/update.py
22
23    sec=10
24    while [ $sec -ge 0 ]; do
25        echo -e "\e[32m> Setup done! Rebooting after : " $sec"s ...\e[0m\r"
26        let "sec=sec-1"
27        sleep 1
28    done
29
30    systemctl poweroff
31
32 else
33     /* passed

```

```

34 echo -e "\e[1;31m> System already setup ...\e[0m"
35
36 fi

```

Listing 5: user\_setup.sh

```

1 import random
2 import string
3
4 str_set = [
5     string.ascii_lowercase,
6     string.ascii_uppercase,
7     string.punctuation,
8     string.digits
9 ]
10
11 print(''.join([random.choice(random.choice([str_set])) for x in range(32)]))

```

Listing 6: user\_setup.sh

Instead of turning it into function, its stdout was instead passed on directly as stdin for line 19, in user\_setup.sh: `password=$(python $HOME/.att_sys/system/utils/password_gen.py)`. This is done since BASH variables can't receive Python's return as stdin.

## Algorithm and the program

Since the algorithm pulls an update every 24 hours, automatically, from the git repository, a persistent module was created that will pull an update from the repository and return the changes to the current database. This was done using `os.system()` function from Python's standard library.

```

1 def pull_data(self):
2     try:
3         if exists(f"{self.HOME}/capstone"):
4             sys(f"rm -rf {self.HOME}/capstone")
5             sys(f"git clone --branch database {self.repo}")
6
7         return True
8     except SystemError or KeyboardInterrupt or OSError or ConnectionError:
9         return False
10
11 def get_data(self):
12     count = 0
13
14     while count < 3:
15         try:
16             with open(f"{self.HOME}/repo/<filename>") as data:
17                 studentDATA = json.load(data)
18
19             with open(f"{self.HOME}/repo/<filename>") as Data:
20                 teacherDATA = json.load(Data)
21
22             return studentDATA, teacherDATA
23
24         except FileNotFoundError:

```



```

25         self.pull_data()
26         count += 1
27         continue
28     else:
29         raise SystemExit(f"""\
30             {C.BOLD+C.RED}> Too much error, please try again later.{C.END}
31             """)

```

Listing 7: Python algorithm for the systemd service to be used to pull a git update on repository.

Which was further coupled with other functions, such as `av_cams()` and `setup()`, to check for available cameras for use in `face_recog.py`, and repository setup for `main.py`, respectively. As a whole, the code reads as:

```

1  import json
2  import cv2 as cv
3
4  from os import system as sys
5  from os.path import exists
6
7  from bin.access import access
8  from misc.colors import colors as C
9
10
11 def av_cams():
12     index, arr = 0, []
13
14     while True:
15         cap = cv.VideoCapture(index)
16
17         if not cap.read()[0]:
18             break
19         else:
20             arr.append(index)
21             cap.release()
22             index += 1
23
24     if arr == []:
25         raise SystemExit(f"{C.RED+C.BOLD}> No camera available.{C.END}")
26     else:
27         input(f"""\
28             {C.GREEN+C.BOLD}> All available cameras: {[f'{num} {cam}' for num, cam in enumerate(arr)]}{C
29             .END}\nPress any key to clear ...
30             """)
31         sys.stdout.write("\033[K")
32
33 class System:
34
35     def __init__(self, HOME, repo, admin_email):
36         self.HOME = HOME
37         self.repo = repo
38         self.admin_email = admin_email
39
40     def pull_data(self):
41         try:
42             if exists(f"{self.HOME}/capstone"):
43                 sys(f"rm -rf {self.HOME}/capstone")
44                 sys(f"git clone --branch database {self.repo}")
45
46             return True
47         except SystemError or KeyboardInterrupt or OSError or ConnectionError:
48             return False
49
50     def get_data(self):
51         count = 0

```

```

52
53     while count < 3:
54         try:
55             with open(f"{self.HOME}/repo/<filename>") as data:
56                 studentDATA = json.load(data)
57
58             with open(f"{self.HOME}/repo/<filename>") as Data:
59                 teacherDATA = json.load(Data)
60
61             return studentDATA, teacherDATA
62
63         except FileNotFoundError:
64             self.pull_data()
65             count += 1
66             continue
67         else:
68             raise SystemExit(f"""\
69                 {C.BOLD+C.RED}> Too much error, please try again later.{C.END}
70                 """)
71
72
73     def setup(self, school_name):
74         ret = access()
75         trial = 0
76
77         if not ret:
78             raise SystemExit(f"""\
79                 {C.BOLD+C.RED}> Too much error, please try again later.{C.END}
80                 """)
81         else:
82             try:
83                 while True:
84                     if trial == 3:
85                         break
86
87                     if not self.pull_data():
88                         trial += 1
89                         continue
90                     else:
91                         break
92             except KeyboardInterrupt:
93                 raise SystemExit(f"""\
94                     {C.BOLD+C.RED}> Too much error, please try again later.{C.END}
95                     """)
96             else:
97                 return self.get_data()
98

```

Listing 8: function.py

Then a module for authorized access was created, these are `access.py` to use the 32 character *pseudo-random* ASCII string security code generated and emailed by `code_email.py`, for access in local database, as well as re-setup of new administrator.

```

1 import os
2
3 from misc.colors import colors
4 from bin.code_email import Email
5
6
7 HOME = os.path.expanduser('~')
8 C = colors()
9
10
11 def access():
12     with open(f"{HOME}/.att_sys/user_info") as info:
13         source = info.readlines()
14

```

```

15 receiver_email, user = source[0].rstrip().strip(), source[1].rstrip().strip()
16 password, school_name = source[2].rstrip().strip(), source[3].rstrip().strip()
17 email = Email(receiver_email, user)
18
19 try:
20     trial, mark = 0, False
21
22     while True:
23         if trial == 3:
24             try:
25                 email.send("alert", school_name)
26             except ConnectionError:
27                 print(f"{C.BOLD+C.RED}> Connection error.{C.END}")
28             finally:
29                 print(f"{C.BOLD+C.RED}> Too much error. Signing off.{C.END}")
30                 os.system("systemctl poweroff")
31
32         if mark:
33             verify = input(f"{C.BOLD}> Kindly input your 32 character password (case sensitive {3-
34             trial} left): {C.END}")
35
36             if verify != password:
37                 trial += 1
38                 send_new = input(f"""\
39                 {C.RED+C.BOLD}> Password doesn't match. {3-trial} left.{C.END}\n{C.BOLD}Send a
40                 new temporary password to your email instead? [y/N]: {C.END}
41                 """)
42
43                 if send_new in ['y', 'Y']:
44                     mark = True
45
46                 continue
47             else:
48                 return True
49
50         else:
51             new_pass = email.send("setup", school_name)
52             verify_new = input(f"""\
53             {C.BOLD}> Kindly input your 32 character password (case sensitive {3-trial} left): {
54             C.END}
55             """)
56
57             if verify_new != new_pass:
58                 print(f"{C.RED+C.BOLD}> Password doesn't match. {3-trial} left.{C.END}")
59                 trial += 1
60                 continue
61             else:
62                 return True
63
64     except KeyboardInterrupt:
65         print(f"{C.BOLD+C.RED}> Probable intruder. Signing off.{C.END}")
66         os.system("systemctl poweroff")

```

Listing 9: access.py

The code above gives 3 strict tries for user. The first try requires the locally generated passphrase during user setup, however if the user failed to authenticate, the program would prompt an stdin to email the given address a new passphrase for access. And if the user still fails to authenticate, the system would enter a self destruct mode, removing the local student and teacher data, while alerting the registered email, which is done by the module below:

```

1 import random
2 import string
3 import smtplib
4 import ssl

```

```

5 import socket
6 import os
7 import geocoder
8
9 from datetime import datetime
10 from email.message import EmailMessage
11
12
13 class Email:
14
15     port, smtp_server = 465, "smtp.gmail.com"
16     sender_email, password = "clydebotrfd@gmail.com", "CCSHSRFIDG5" # fill up later
17
18     def __init__(self, receiver_email, user):
19         self.receiver_email = receiver_email
20         self.user = user
21
22     def send(self, access, school_name, student_name=None):
23         str_set = [
24             string.ascii_lowercase,
25             string.ascii_uppercase,
26             string.punctuation,
27             string.digits
28         ]
29
30         msg, msg["From"], msg["To"] = EmailMessage(), self.sender_email, self.receiver_email
31         phrase = ''.join([random.choice(random.choice(str_set)) for x in range(32)])
32
33         if access == "setup":
34             msg["Subject"] = "Secure access phrase"
35             msg.set_content(f"""\
36             <!DOCTYPE html>
37             <html>
38                 </body>
39                 <p align=justify>
40                     Hello, TapTap is here to deliver the secure passphrase requested by: <b>{self.
41                     receiver_email}</b> ({self.user}) from {school_name}</b>.<br><br>
42                     <em>DO NOT SHARE THIS CODE FOR USE IN SETUP/GIT PULL OF THE DATABASE</em>. This
43                     is the secure phrase for your access of the student and teacher data in repository setup: <br><br>
44                     center><b><code>{phrase}</code></b></center>
45                     </p>
46                     <p align=justify>
47                         If you are not trying to access, ignore this email. The details of the computer
48                         are:<br><br>User: <i>{os.getlogin()}</i><br>HOSTNAME: <i>{socket.gethostname()}</i><br>IP address: <
49                         i>{socket.gethostbyname(socket.gethostname())}</i><br>Tracked from: <i>{geocoder.ip('me')}</i> at {
50                         datetime.now().strftime('%d/%m/%Y %H:%M:%S')}</i>.<br><br>Cheers,<br>TapTap team</br></p>
51                     </body>
52                     </html>
53                     """, subtype="html")
54
55             elif access == "alert":
56                 msg["Subject"] = "Breach attempt alert."
57                 msg.set_content(f"""\
58                 <!DOCTYPE html>
59                 <html>
60                     </body>
61                     <p align=justify>
62                         Hello, TapTap is here to alert <b>{self.receiver_email}</b> ({self.user}) from {
63                         school_name}</b> of possible breach alert.<br><br>
64                         Your device has been receiving various passphrase mismatch. Due to the setup
65                         of device, it is shutting down as you receive this email. You can access it later on.
66                         </p>
67                         <p align=justify>
68                             If you are not trying to access, ignore this email. The details of the
69                             computer are:<br><br>User: <i>{os.getlogin()}</i><br>HOSTNAME:
70                             <i>{socket.gethostname()}</i><br>IP address: <i>{socket.gethostbyname(socket
71                             .gethostname())}</i><br>Tracked from: <i>{geocoder.ip('me')}</i> at {datetime.now().strftime('%d/%m/%Y
72                             %H:%M:%S')}</i>.<br><br>
73                             </p>

```

```

67         <p align=justify>
68             This was done as security measure, the email in situation that met the
               criterion is inevitable.<br><blockquote>Cheers,<br>TapTap team</blockquote>
69         </p>
70     </body>
71 </html>
72     """ , subtype="html")
73
74     elif access == "student true":
75         msg["Subject"] = f"{student_name} registered"
76         msg.set_content(f"""\
77 <!DOCTYPE html>
78 <html>
79     </body>
80     <p align=justify>
81         Hello, TapTap is here to notify that {student_name} of {school_name} has finally
               arrived his class at {datetime.now().strftime('%d/%m/%Y %H:%M:%S')}, and is present in school today
               . Thank you!
82     </p>
83
84     </body>
85 </html>
86     """ , subtype="html")
87
88     try:
89         # send the email to the user for the code.
90         context = ssl.create_default_context()
91         with smtplib.SMTP_SSL(self.smtp_server, self.port, context=context) as server:
92             server.login(self.sender_email, self.password)
93             server.send_message(msg)
94     except ConnectionError:
95         return "Please try again later."
96     else:
97         return phrase

```

Listing 10: code\_email.py

access.py then was also used in main.py, as well as the update utility residing in ./system/utills/update.py that performs database updates:

```

1 import os
2
3 from src.bin.access import access
4 from misc.colors import colors as C
5
6
7 HOME = os.path.expanduser('~')
8
9
10 def update():
11     ret = access()
12
13     if ret:
14         if not os.path.exists(f"{HOME}/repo"):
15             os.system("git clone https://github.com/testno0/repo $HOME/ && /dev/null")
16         else:
17             print(f"{C.BOLD+C.GREEN} User system setup passed.{C.END}")
18             os.system(f"cd {HOME}/repo/ && git pull")
19     else:
20         # false phase, pass : #? passing
21         os.system("rm -rf {HOME}/repo/")
22         print(f"""\
23 {C.BOLD+C.RED}> Verification error, repository was nuked by system for security.{C.END}
24 """)
25         os.system("systemctl poweroff")
26

```

Listing 11: code\_email.py

main.py on the other hand was the main module by the program, this is called by cli.py, which is the interface that would provide the user interaction with the system, for general use:

```

1 from sys import argv as INPT, stdout
2 from difflib import SequenceMatcher as SM
3 from os import path
4 from time import sleep
5
6 from function import System
7 from bin.code_email import Email
8 from misc.colors import colors as C
9
10 # repo link is the link of this repository https://github.com/testno0/repo
11 # although leave it blank as first, no one touches the parameters
12
13
14 def main(school_name=school_name, source=source):
15     """Initiate the system, use try, except, else block to catch errors and to organize the procedures
16     based on the cases the system gives."""
17
18     HOME = path.expanduser('~')
19
20     with open(f"{HOME}/.att_sys/user_info") as info:
21         source = info.readlines()
22
23     receiver_email, user = source[0].rstrip().strip(), source[1].rstrip().strip()
24     password, school_name = source[2].rstrip().strip(), source[3].rstrip().strip()
25     sysINIT = System(HOME, "https://github.com/testno0/repo", receiver_email)
26
27     try:
28         print(f"{C.GREEN+C.BOLD}> Fetching data.{C.END}")
29         if not path.exists(f"{HOME}/repo"):
30             print(f"
31                 {C.GREEN+C.BOLD}> The repository is not setup. Setting up the repository.{C.END}
32                 ")
33             studentDATA, teacherDATA = sysINIT.setup(school_name)
34         else:
35             studentDATA, teacherDATA = sysINIT.get_data()
36     except ConnectionError: # add other exceptions later
37         raise SystemExit(f"{C.RED+C.BOLD}> Connection Error.{C.END}")
38     except KeyboardInterrupt:
39         raise SystemExit(f"{C.RED+C.BOLD}> Keyboard Interrupt.{C.END}")
40     except SystemError:
41         raise SystemExit(f"{C.RED+C.BOLD}> System Error.{C.END}")
42     else:
43         # notify the user
44         print(f"{C.GREEN+C.BOLD+C.BLINK}> System ready.{C.END}", end="\r")
45
46         # init free time
47         sleep(5)
48         # remove the messages
49         stdout.write("\033[K")
50
51         email = Email()
52         while True:
53             cardID = INPT[0]
54
55             for ID in studentDATA:
56                 if SM(None, cardID, ID).ratio() == 1:
57                     print(f"{C.GREEN+C.BOLD}> Student recognized.{C.END}")
58                     email.send("student true", source[3].rstrip().strip(), studentDATA[ID][0])
59                 else:
60                     print(f"{C.RED+C.BOLD}> Error.{C.END}")
61                     # leave at blank first
62                     email.send("student true", source[3].rstrip().strip(), studentDATA[ID][0])
63             continue

```

Listing 12: code\_email.py

And for the face recognition:

```

1 import face_recognition as fr
2 import numpy as np
3 import cv2 as cv
4
5 from os.path import expanduser
6
7 from functions import av_cams
8
9
10 def face_recognition():
11     av_cams()
12     path_ = f"{expanduser('~')}/temporary/capstone/sample/"
13
14     # load face references from path_.
15     # ezeziel lopez encoding
16     ref_face = fr.load_image_file(f"{path_}/test_1.png")
17     rf_encoding = fr.face_encodings(ref_face)[0]
18
19     # laisie angela donato encoding
20     ref_face_2 = fr.load_image_file(f"{path_}/test_2.png")
21     rf_encoding2 = fr.face_encodings(ref_face_2)[0]
22
23     known_fe = [
24         rf_encoding,
25         rf_encoding2,
26     ]
27     known_fnames = [
28         "Ezekiel Lopez",
29         "Laisie Angela Donato",
30     ]
31
32     # Initialize some variables
33     face_locations, face_encodings, face_names = [], [], []
34     process_this_frame = True
35
36     # video capture
37     vid = cv.VideoCapture(0)
38
39     while True:
40         # take frame and references from video capture
41         _, frame = vid.read()
42
43         # resizing to smaller frame, to avoid much larger use of gpu and
44         # memory, also to decrease the processing time convert to
45         # another color.
46         small_frame = cv.resize(frame, (0, 0), fx=0.25, fy=0.25)
47
48         # convert to another color.
49         rgb_small_frame = small_frame[:, :, ::-1]
50
51         if process_this_frame:
52             # get all the face encoding and location in the current
53             # frame returned by the live camera input.
54             face_locations = fr.face_locations(rgb_small_frame)
55             face_encodings = fr.face_encodings(rgb_small_frame, face_locations)
56
57             face_names = []
58             for face_encoding in face_encodings:
59                 matches = fr.compare_faces(known_fe, face_encoding)
60                 name = "unknown"
61
62                 # Or instead, use the known face with the smallest
63                 # distance to the new face
64                 face_distances = fr.face_distance(known_fe, face_encoding)
65                 best_match_index = np.argmin(face_distances)
66                 if matches[best_match_index]:
67                     name = known_fnames[best_match_index]
68
69                 face_names.append(name)
70
71             for (top, right, bottom, left) in face_locations:
72                 top *= 4
73                 right *= 4

```

```

74         bottom *= 4
75         left *= 4
76
77         # output the box in the frame
78         if name != "unknown":
79             cv.rectangle(frame, (left, top), (right, bottom), (0, 255, 0), 2)
80
81             # Draw a label with a name below the face
82             cv.rectangle(frame, (left, bottom - 35), (right, bottom), (0, 255, 0), cv.FILLED)
83             font = cv.FONT_HERSHEY_DUPLEX
84             cv.putText(frame, name, (left + 6, bottom - 6), font, 1.0, (255, 255, 255), 1)
85         else:
86             cv.rectangle(frame, (left, top), (right, bottom), (0, 0, 255), 2)
87
88             # Draw a label with a name below the face
89             cv.rectangle(frame, (left, bottom - 35), (right, bottom), (0, 0, 255), cv.FILLED)
90             font = cv.FONT_HERSHEY_DUPLEX
91             cv.putText(frame, name, (left + 6, bottom - 6), font, 1.0, (255, 255, 255), 1)
92
93
94         # display the resulting image
95         cv.imshow("Video", frame)
96
97         # hit 'q' on the keyboard to quit!
98         if cv.waitKey(1) & 0xFF == ord('q'):
99             break
100
101     vid.release()
102     cv.destroyAllWindows()

```

Listing 13: code\_email.py

face\_recog.py utilizes the numpy, python-cv2, and face\_recognition module, as well as other user defined functions. The numpy was used for calculation of face distances, python-cv2 provides the real time access to camera input, and face\_recognition encodes the face of user from database as references of the real time input.

```

1 import argparse
2 import sys
3 import os
4
5 from main import main
6 from function import System
7 from misc.colors import colors
8 from system.utils.update import update
9
10
11 def program_options():
12     C = colors()
13     description = """\
14         This is a program designed to interact with the TapTap, an RFID system designed by Capstone
15         Group 5.
16     """
17     parser = argparse.ArgumentParser(
18         prog="taptap",
19         usage="taptap [OPTIONS]",
20         description=description
21     )
22
23     # all of the functions listed below prompts for the local or temporary password email to the user
24     # using python's stdlib smtplib and ssl, this requires internet connection, else the user need to
25     # the password they received during the setup.
26
27     # start/use the system
28     parser.add_argument("-use", "--use", help="Use the system.", action="store_true")
29     # update the database by calling the fetch database function from src.function

```



```

30 parser.add_argument("-U", "--update", help="Update the system", action="store_true")
31 # (re)setup the user
32 parser.add_argument(
33     "-s",
34     "--usersetup",
35     help="Setup the user (prompts to input the passphrase sent via email, if used again).",
36     action="store_true"
37 )
38 # destroy the system, can be used in case of intruder breach
39 parser.add_argument("-d", "--destroy", help="Destroy the user database.", action="store_true")
40
41 args = parser.parse_args()
42
43 if args.use:
44     main() #? likely passing
45 elif args.update:
46     update() #* passed
47 elif args.usersetup:
48     os.system("./$HOME/.att_sys/system/setup.sh") #* passed
49 elif args.destroy:
50     os.system("echo 'rm -rf $HOME/.att_sys'") #* passed
51
52 program_options()

```

Listing 14: code\_email.py

And finally, is the cli.py that acts as mediator for all of the modules, which utilized argparse module for creation of program options, as well as sys and os for supporting roles.

## Git and command logs

The changes per commit/update can be viewed here, including the cryptographic hash of the change (SHA1), author of the changes<sup>‡</sup>, date, time, and changes done, this was recorded by version control system, git, and Fedora Linux 35 package of Richard Stallman's GNU BASH (Bourne Again SHell):

```

1 commit 08728ed3d6af99f7886b8fd8ae556b8e3ad18f553
2 Author: iaacornus <#####.#####@gmail.com>
3 Date: Tue May 10 15:17:52 2022 +0800
4
5     add av_cam function to simplify face_recognition.py
6
7 commit 031bb3918d0aaac6cd49384bfc2f3929fe68e69b
8 Author: iaacornus <#####.#####@gmail.com>
9 Date: Tue May 10 15:17:14 2022 +0800
10
11     another rfid build
12
13 commit 4948218e6cae07badc0c8a0dc05ff45b81182e
14 Author: iaacornus <#####.#####@gmail.com>
15 Date: Tue May 10 15:16:54 2022 +0800
16
17     face sample for testing
18

```

---

<sup>‡</sup>iaacornus/testno0 is account of James Aaron Erang, the former is the main account, and the latter being backup account.

The email were also removed for security and privacy of the author, it can be verified via <https://github.com/iaacornus/>.

```

19 commit fa50446f592f10175c1251c894f9ea27c383fcec
20 Author: iaacornus <#####.#####@gmail.com>
21 Date: Tue May 10 15:16:42 2022 +0800
22
23     successful face recognition build
24
25 commit 8912de58f0fe29dbcfb980a31292cc2444093f2b
26 Author: iaacornus <#####.#####@gmail.com>
27 Date: Tue May 10 15:16:22 2022 +0800
28
29     face recognition pycache
30
31 commit 3c4e3230dc286259f5823b6630616e508262190e
32 Author: testno0 <96910593+testno0@users.noreply.github.com>
33 Date: Tue May 10 12:20:55 2022 +0800
34
35     fixed lock mechanism
36
37 commit 6e282724d21103bf438c2e87b1c74ff79fa62129
38 Author: testno0 <96910593+testno0@users.noreply.github.com>
39 Date: Tue May 10 12:15:54 2022 +0800
40
41     upp
42
43 commit 96edca1570255437b786fe3696a9932c6ccc31a5
44 Author: testno0 <96910593+testno0@users.noreply.github.com>
45 Date: Tue May 10 12:01:14 2022 +0800
46
47     fixed while loop
48
49 commit 19568e5ed5dc91e47dc956409b77e02d927033a0
50 Author: testno0 <96910593+testno0@users.noreply.github.com>
51 Date: Tue May 10 11:28:47 2022 +0800
52
53     optimized algorithm
54
55 commit 1473b0c7320b6758a2f359c690015d3cf3425093
56 Author: testno0 <96910593+testno0@users.noreply.github.com>
57 Date: Tue May 10 10:35:55 2022 +0800
58
59     Create main.cpp
60
61 commit c916ec11f5453df8c08dbdfce56208f55bccbfc2
62 Author: testno0 <#####@gmail.com>
63 Date: Wed May 4 01:16:57 2022 +0800
64
65     changed exec env to specifiers
66
67 commit f2ccbe8a081c51fcfa44dbbaaea003b04f7be729
68 Author: testno0 <#####@gmail.com>
69 Date: Wed May 4 00:46:00 2022 +0800
70
71     initial codebase
72
73 commit 33dc8651f092e5e13b83630b9249160e313e2b1c
74 Author: testno0 <#####@gmail.com>
75 Date: Wed May 4 00:45:44 2022 +0800
76
77     add testing py file for fr
78
79 commit c7fb7431596817e7d64d9e5ba02b90d9121ac7eb
80 Author: testno0 <#####@gmail.com>
81 Date: Wed May 4 00:14:30 2022 +0800
82
83     add python image library (PIL) -- pillow as deps
84
85 commit 1a77c746008838095588877f326eeecf9425cd1
86 Author: testno0 <#####@gmail.com>
87 Date: Wed May 4 00:14:10 2022 +0800
88
89     add obama faces as another ref
90
91 commit 1f1fb87451955279afd0c5eb70e098fa20cc03cf

```

```

92 Author: testno0 <#####@gmail.com>
93 Date: Wed May 4 00:13:57 2022 +0800
94
95     add joe biden faces as references
96
97 commit 9a0cba4fela186bc2a5961be460ba9568a17f225
98 Author: testno0 <#####@gmail.com>
99 Date: Wed May 4 00:08:23 2022 +0800
100
101     add sample faces for testing
102
103 commit de938512623ebb2c324946d23f67a906ba8d891e
104 Author: testno0 <#####@gmail.com>
105 Date: Tue May 3 23:44:48 2022 +0800
106
107     add back opencv2 for coupling with face_recognition module
108
109 commit 789712fa9146673f0e17d8c51013ffb1c335aa3f
110 Merge: 756cbaf be696d8
111 Author: testno0 <96910593+testno0@users.noreply.github.com>
112 Date: Tue May 3 23:37:36 2022 +0800
113
114     Merge pull request #2 from testno0/cli
115
116     mini fixes, preperation for face recognition devel
117
118 commit be696d8d42bddcbd177afcfcdcf43870a77ea059
119 Author: testno0 <#####@gmail.com>
120 Date: Tue May 3 23:34:00 2022 +0800
121
122     add the command logs in the virtual env used
123
124 commit 81bc86ba2af5b0096180b6dea23a6bc012b4b3e8
125 Author: testno0 <#####@gmail.com>
126 Date: Tue May 3 23:33:23 2022 +0800
127
128     add the new commits
129
130 commit 1abefd59c0e92ee9d749c9d8d36febdce101cc51
131 Author: testno0 <#####@gmail.com>
132 Date: Tue May 3 23:32:01 2022 +0800
133
134     simplified the src code moving into the app folder
135
136 commit 2b64a6b05571fddc7f620e431d54d31fa13868bf
137 Author: testno0 <#####@gmail.com>
138 Date: Tue May 3 23:31:30 2022 +0800
139
140     add face_recognition as requirements and removed cv2
141
142 commit 756cbaf5d9ee453a795ba6ca6e4267b0b4d5bbe0
143 Merge: b6acf48 6424837
144 Author: testno0 <96910593+testno0@users.noreply.github.com>
145 Date: Sun May 1 21:37:09 2022 +0800
146
147     Merge pull request #1 from testno0/cli
148
149     cli implementation and other tests from test-v1-beta merged to devel branch for further testing and
150     coding as well as implementation of other features
151
152 commit 6424837a3bfddb1b63959a0552de4f4afe90e819
153 Author: testno0 <#####@gmail.com>
154 Date: Sun May 1 21:33:01 2022 +0800
155
156     the loop bug were removed, the trial limit were also barred into 3
157
158     the feedback were also changed
159
160 commit 0d7eea85a30488ef36919ba94ee14db4e392cbe8
161 Author: testno0 <#####@gmail.com>
162 Date: Sun May 1 21:32:23 2022 +0800
163
164     satisfied the requirements of imports from code_email and function.py

```

```

164
165 commit 37d76b8969274a929094033b5fe70d074ccb0668
166 Author: testno0 <#####@gmail.com>
167 Date: Sun May 1 21:30:24 2022 +0800
168
169     tested and add commands
170
171 commit 476f4461b8cc05de87f72255b75d1b0b9bcf55df
172 Author: testno0 <#####@gmail.com>
173 Date: Sun May 1 21:05:24 2022 +0800
174
175     changed the message if the student is present
176
177 commit 8a91a492c273e724e230482e8f36cc0fc30a889b
178 Author: testno0 <#####@gmail.com>
179 Date: Sun May 1 21:05:01 2022 +0800
180
181     fixed the system structure and add chmod to the script to easily execute the script
182
183 commit 95c0ef822e1ccbb95a6532a3dd9c1219b325a96a
184 Author: testno0 <#####@gmail.com>
185 Date: Sun May 1 21:03:55 2022 +0800
186
187     used > redirection to avoid errors
188
189 commit fe0a08a097df30a50656fe88984d3073698b8bbf
190 Author: testno0 <#####@gmail.com>
191 Date: Sun May 1 21:03:27 2022 +0800
192
193     changed the dir of alias
194
195 commit 5a571de6825076bceb3b6046633dba54951c1a86
196 Author: testno0 <#####@gmail.com>
197 Date: Sun May 1 20:49:16 2022 +0800
198
199     add info about merging plan, and documentation of cli
200
201 commit 3d91f5f95e7582d972367f9d01bb5a13c7f10123
202 Author: testno0 <#####@gmail.com>
203 Date: Sun May 1 20:48:48 2022 +0800
204
205     reexproted the logs as of may 01, 2022 @ 20:48
206
207 commit f31e9cddb5751d93f4d236b3c3f85f1e099fdb1
208 Author: testno0 <#####@gmail.com>
209 Date: Sun May 1 20:30:38 2022 +0800
210
211     fixed the output as well as exception handling, and variable ref
212
213 commit 71dadfe6b5feba0b2dc948cca4290a7f77eadcbc
214 Author: testno0 <#####@gmail.com>
215 Date: Sun May 1 20:29:29 2022 +0800
216
217     fixed the setup() function
218
219     other information were instead retrieved from the user file info instead of being a parameter
220
221 commit d4f53bde7fa1fca58c14de78c0a925585dfc3b6a
222 Author: testno0 <#####@gmail.com>
223 Date: Sun May 1 20:28:23 2022 +0800
224
225     fixed imports and conditions
226
227 commit af0959f35eb4c1d4dbe560016115a4945d135f28
228 Author: testno0 <#####@gmail.com>
229 Date: Sun May 1 20:26:55 2022 +0800
230
231     removed other entries
232
233 commit caab29e7867b022f5a9076a6cbb315a971be8d69
234 Author: testno0 <#####@gmail.com>
235 Date: Sun May 1 20:24:17 2022 +0800
236

```

```

237     removed tests folder since it is nonsensical
238
239 commit 58e37cd49c8195a6e8fae9f6943382b91e2a4f5e
240 Author: testno0 <#####@gmail.com>
241 Date:   Sun May 1 20:23:40 2022 +0800
242
243     aliased python cli.py to taptap instead of creating a setup.py script
244
245 commit a6551f4c70df4fd1722582bf44d18a32d236939b
246 Author: testno0 <#####@gmail.com>
247 Date:   Sun May 1 19:50:06 2022 +0800
248
249     moved the user setup part from setup.sh
250
251 commit 19f03e5faa4243b37dc17291651d4a169c3cc459
252 Author: testno0 <#####@gmail.com>
253 Date:   Sun May 1 19:47:29 2022 +0800
254
255     splited into user_setup.sh and pre_setup.sh
256
257 commit adca9b4f18cde381634c2ae6c95e2763d6064ce4
258 Author: testno0 <#####@gmail.com>
259 Date:   Sun May 1 19:47:07 2022 +0800
260
261     moved into src/
262
263 commit 2a207b345f5b87a7f47c18e1a7e79fd858cafef0
264 Author: testno0 <#####@gmail.com>
265 Date:   Sun May 1 19:46:26 2022 +0800
266
267     turned into function, so can be easily called from cli.py
268
269 commit 0833ccd355942f2deceaf6b001b9949bfd3aa60e
270 Author: testno0 <#####@gmail.com>
271 Date:   Sun May 1 19:45:59 2022 +0800
272
273 removed the .bashrc, since alias aren't needed anymore as the options were unified in cli.py
274
275 commit 533edcc6d6e246d22305e124ac9eca19e90f1281
276 Author: testno0 <#####@gmail.com>
277 Date:   Sun May 1 19:45:30 2022 +0800
278
279     used for -s option in cli.py
280
281 commit 530ce099ded8022f38df86f59aa13760811878f8
282 Author: testno0 <#####@gmail.com>
283 Date:   Sun May 1 19:45:07 2022 +0800
284
285     isolated the system setup from user setup, due to the options made in cli program
286
287     since having to redo all the steps may brick the system and is too trivial and troublesome
288
289 commit e68e9528852c84df987d8f8cc29e5d6c7471e5de
290 Author: testno0 <#####@gmail.com>
291 Date:   Sun May 1 19:44:00 2022 +0800
292
293     moved to src/ instead of src/algorithm
294
295     this was done for easier navigation of the application
296
297 commit 59e7dd68fa0c1f7458480e4b72627208011a2829
298 Author: testno0 <#####@gmail.com>
299 Date:   Sun May 1 19:43:21 2022 +0800
300
301     created cli for the program
302
303 commit dfade36107847e7643f879761d1161f041811d3c
304 Author: testno0 <#####@gmail.com>
305 Date:   Sun May 1 19:19:05 2022 +0800
306
307     add another dir for .gitignore
308
309 commit da66dbf2e046eb786d91eb4d3fe46d889bd35f57

```

```

310 Author: testno0 <#####@gmail.com>
311 Date: Sun May 1 19:18:05 2022 +0800
312
313     this was added to allow relative imports
314
315 commit 215a208a96b9fad34440e4c178c906385f6f9335
316 Author: testno0 <#####@gmail.com>
317 Date: Sun May 1 19:17:39 2022 +0800
318
319     fixed imports
320
321 commit 1b20af51f53f08b5dffdbc87b466d7e42f08b6c8
322 Author: testno0 <96910593+testno0@users.noreply.github.com>
323 Date: Sun May 1 18:45:01 2022 +0800
324
325     turned into function
326
327 commit 2cb6adaa4884cb442d1f3e25dd807621abfe508c
328 Author: testno0 <#####@gmail.com>
329 Date: Sun May 1 01:37:51 2022 +0800
330
331     add the pycache
332
333 commit 5ad17c5c643546610cad5a4eda75a7fd5188cc6e
334 Author: testno0 <#####@gmail.com>
335 Date: Sun May 1 01:37:13 2022 +0800
336
337     put the loop into try, else statement to further enforce the security
338
339 commit f974397be4097fdc6d535ca2204f0ea2fd6ac2ca
340 Author: testno0 <#####@gmail.com>
341 Date: Sun May 1 01:36:24 2022 +0800
342
343     add alert msg, and changed some of the formatting and conducted a test
344
345 commit c96207ec81fd34b0dd01bda67cd48483b034941d
346 Author: testno0 <#####@gmail.com>
347 Date: Sun May 1 01:36:00 2022 +0800
348
349     add the test log of access.py
350
351 commit b6acf4811cd8df50a1c110bb6b6e46e31db95be2
352 Author: testno0 <#####@gmail.com>
353 Date: Thu Apr 28 23:55:11 2022 +0800
354
355     used the github template of .gitignore and add pycache folder
356
357 commit 9c65e3e05f5de5ca1d00311cf4ea1d513c87a8b2
358 Author: testno0 <#####@gmail.com>
359 Date: Thu Apr 28 23:52:58 2022 +0800
360
361     fixed the sys.path
362
363 commit d76baa8a25cfe5bd6b9856374371b581aa06bdfe
364 Author: testno0 <#####@gmail.com>
365 Date: Thu Apr 28 23:52:24 2022 +0800
366
367     removed function, that the script can catch the value
368
369 commit fb8697c08552eaaa4b64d796914689bf89bafa9a
370 Author: testno0 <#####@gmail.com>
371 Date: Thu Apr 28 23:51:41 2022 +0800
372
373     fixed bash to python, it was also discovered that the systemd setup part is failing
374
375 commit dfa45f8c4c3864e3bdcc93f03622f2370dae05
376 Author: testno0 <#####@gmail.com>
377 Date: Thu Apr 28 23:50:52 2022 +0800
378
379     output of setup.sh
380
381 commit d7eaf989609261ab969b3da4471cee6b4a4e72cd
382 Author: testno0 <#####@gmail.com>

```

```

383 Date: Thu Apr 28 23:35:26 2022 +0800
384
385 removed the accidental import
386
387 commit 1c4fca9076834ba29b3b4414f410e0c13c478c0e
388 Author: testno0 <#####@gmail.com>
389 Date: Thu Apr 28 23:35:07 2022 +0800
390
391 print was used instead of return to store the variable in bash script
392
393 commit e2cefe80c61cfc3dec3eef9763d7d714ac776b8
394 Author: testno0 <#####@gmail.com>
395 Date: Thu Apr 28 23:34:39 2022 +0800
396
397 evaluators were fixed, as well as feedbacks
398
399 commit 08363d2f7e30bb587b02b74d2b619b3ce4aca75a
400 Author: testno0 <#####@gmail.com>
401 Date: Thu Apr 28 23:21:17 2022 +0800
402
403 replaced with update.py
404
405 commit 53a3ede30965ccc42b39f2f13e2e283f4e50b13d
406 Author: testno0 <#####@gmail.com>
407 Date: Thu Apr 28 23:20:59 2022 +0800
408
409 fixed the formatting
410
411 commit be3887c9a75c2d69dd723a5c39295321ef1bc9b1
412 Author: testno0 <#####@gmail.com>
413 Date: Thu Apr 28 23:20:48 2022 +0800
414
415 changed the sys.append
416
417 commit cad839a79ce799de8c82c02d6a13bcc0c1494c18
418 Author: testno0 <#####@gmail.com>
419 Date: Thu Apr 28 23:20:30 2022 +0800
420
421 removed update.sh and replaced with update.py
422
423 commit 33797d25deb59cd3691c7c7dcdad74305d9eb813
424 Author: testno0 <#####@gmail.com>
425 Date: Thu Apr 28 22:55:59 2022 +0800
426
427 fixed errors
428
429 commit 3ebe813fec22ff925dd15fea725121f4f283072c
430 Author: testno0 <#####@gmail.com>
431 Date: Thu Apr 28 22:55:24 2022 +0800
432
433 add the other dir to their path, for successful import
434
435 commit d166d28b470c4105402f3137e9c7f8fd8cb25930
436 Author: testno0 <#####@gmail.com>
437 Date: Thu Apr 28 21:59:29 2022 +0800
438
439 synchronized with the changes from setup.sh and code_email.py
440
441 commit a5b177f7bb614c9a4f9079c9d8166ffa35c03d21
442 Author: testno0 <#####@gmail.com>
443 Date: Thu Apr 28 21:59:07 2022 +0800
444
445 add prompt for school name
446
447 commit fa4020f9c9c32b47772878cfe243f48f39e7b3de
448 Author: testno0 <#####@gmail.com>
449 Date: Thu Apr 28 21:58:41 2022 +0800
450
451 merged the 2 email functions, and add more information in the msg
452
453 the informations included are school name, parent, student and teachers name, as well as the time
454 that the student logged in

```

```

455 commit b2f2be4bd0f12e29bf6b5b97efb0015085ddcfa7
456 Author: testno0 <#####@gmail.com>
457 Date: Thu Apr 28 21:31:16 2022 +0800
458
459     enforced the password access, not foolproof, can be easily wrecked by non idiots user, but since the
460     user will be idiots, it should work
461
462 commit 0e1ac1eac3001496e280ee6116f0922426efef91
463 Author: testno0 <#####@gmail.com>
464 Date: Thu Apr 28 21:14:34 2022 +0800
465
466     add password generator for setup.
467
468 commit 3f1b4e3dd667900267f6eb17857da47bd15a2c4f
469 Author: testno0 <#####@gmail.com>
470 Date: Thu Apr 28 21:14:14 2022 +0800
471
472     initial src code, integrated the secure access
473
474 commit e54593bd77bafff86df97a59c13276c4a8d04072
475 Author: testno0 <#####@gmail.com>
476 Date: Thu Apr 28 21:11:52 2022 +0800
477
478     improved the accessing algorithm
479
480     add backup, same concept with forgot password. enforced the trial limit to 3
481
482 commit b03b9d6d6b4dc4b2a069419948bb600634d0d74f
483 Author: testno0 <#####@gmail.com>
484 Date: Thu Apr 28 20:49:14 2022 +0800
485
486     fixed the initialized setup script
487
488     fixed the dir of the src codes, improved the user setup, and fixed the secure setup
489
490 commit 8c2ac64cac32744c7e917345de7c497b8ff2a218
491 Author: testno0 <#####@gmail.com>
492 Date: Thu Apr 28 20:46:27 2022 +0800
493
494     modified the bashrc
495
496     replaced the alias with new alias, fix PS1 to more friendly prompt, and removed the other functions
497
498 commit 754cb51a61493acc637falccb6c8a5be63ef5e45
499 Author: testno0 <#####@gmail.com>
500 Date: Thu Apr 28 20:41:28 2022 +0800
501
502     add bashrc to the system
503
504 commit 2f37ea47eed360bc7ad8d3454421392d1400bf13
505 Author: testno0 <#####@gmail.com>
506 Date: Thu Apr 28 19:59:24 2022 +0800
507
508     export git log to logs file for traces and documentation
509
510 commit c3b42ef8925a84f25b0a1354ce2cf09394d0bea9
511 Author: testno0 <#####@gmail.com>
512 Date: Thu Apr 28 19:59:08 2022 +0800
513
514     announced the start of phase 2
515
516 commit b4f73ced94d987ae73ee54c8034f342aa16db764
517 Author: testno0 <#####@gmail.com>
518 Date: Thu Apr 28 19:56:08 2022 +0800
519
520     changed opencv2 to opencv-python
521
522 commit d4406378e50decf0a66fdb354a19ce2f4b7429a5
523 Author: testno0 <#####@gmail.com>
524 Date: Thu Apr 28 19:45:49 2022 +0800
525
526     add instructions for install

```



```

527 commit 64c669b4297b434e6f474a4f7909dce9df4d2a79
528 Author: testno0 <#####@gmail.com>
529 Date: Thu Apr 28 19:43:02 2022 +0800
530
531     improved syntaxes and formatting
532
533 commit 2b865bd3a20e3ff89eb972b9234321eb64c412e2
534 Author: testno0 <#####@gmail.com>
535 Date: Mon Apr 25 22:37:54 2022 +0800
536
537     improved the setup script
538
539     changed the sequence, add more work such as full system upgrade first.
540
541 commit fee83e996df6b0e73d92c2aabca821153bb7d4ac
542 Author: testno0 <#####@gmail.com>
543 Date: Mon Apr 25 22:33:19 2022 +0800
544
545     moved into setup.sh
546
547 commit d50f7a20324692e0bc64d0538790425d55fa33d5
548 Author: testno0 <#####@gmail.com>
549 Date: Mon Apr 25 22:19:34 2022 +0800
550
551     improved exception handling, setup, and add more feedback
552
553 commit b250d101c22e37f5157eb130bb78e910aead8c03
554 Author: testno0 <#####@gmail.com>
555 Date: Mon Apr 25 22:19:07 2022 +0800
556
557     remove the excessive use of while loop
558
559     the persistence was also decreased to level 3, instead of infinite
560
561 commit 76a0d462076f5094c417ef0320c15db81beb4fe8
562 Author: testno0 <#####@gmail.com>
563 Date: Mon Apr 25 22:18:13 2022 +0800
564
565     add alert message function
566
567 commit 9763d9f65f1f49274f2f3da65f76301bc6ee029a
568 Author: testno0 <#####@gmail.com>
569 Date: Mon Apr 25 22:17:39 2022 +0800
570
571     add colors for easier diagnostic or response reading
572
573 commit bb4c1a519d780d943a0816c9a6af4e2a9bdbdfc6
574 Author: testno0 <#####@gmail.com>
575 Date: Mon Apr 25 21:51:27 2022 +0800
576
577     created the systemd service for checking
578
579 commit e0ef3d7f2967e7815cb9d2e10266d442179e23eb
580 Author: testno0 <#####@gmail.com>
581 Date: Mon Apr 25 21:44:26 2022 +0800
582
583     pre update
584
585 commit 9cfff85e77d0d9725a6ef63c3879aff40b4f023c
586 Author: testno0 <#####@gmail.com>
587 Date: Mon Apr 25 21:44:17 2022 +0800
588
589     add secure phrase send function and msg
590
591 commit 877e1ce5c4dc2375e86170db1485a359686c40fb
592 Author: testno0 <#####@gmail.com>
593 Date: Mon Apr 25 21:44:00 2022 +0800
594
595     improved the codebase
596
597     synched with function.py and simplified the codebase overall
598
599 commit 19b98211c7819d5ccd086115f3eef9ef1033b97c

```

```

600 Author: testno0 <#####@gmail.com>
601 Date: Mon Apr 25 21:43:11 2022 +0800
602
603     add dependency list
604
605 commit d725e452f8c6991a1a3bcd07a82365e92390ee1
606 Author: testno0 <#####@gmail.com>
607 Date: Mon Apr 25 21:43:01 2022 +0800
608
609     add gitignore
610
611 commit 95e87ede62bc9a76b3f40bf7f32ce9525b6c8d01
612 Author: testno0 <#####@gmail.com>
613 Date: Mon Apr 25 21:42:27 2022 +0800
614
615     improved the codebase
616
617     add secure setup function with integrated secure codephrase of 32 char
618
619 commit b603a4a7b45c7bcfc9ddddd6661a326c57f2ac5be
620 Author: testno0 <#####@gmail.com>
621 Date: Mon Apr 25 21:41:52 2022 +0800
622
623     removed manscrpt files
624
625 commit 185770219b8b44408446247cb27bca0f6d0fadaf
626 Author: testno0 <96910593+testno0@users.noreply.github.com>
627 Date: Mon Mar 21 15:28:38 2022 +0800
628
629     optimized the fetch data algorithm
630
631 commit 9fe61ee33631e2fb4150a44720311e890f44a8d6
632 Author: testno0 <96910593+testno0@users.noreply.github.com>
633 Date: Mon Mar 21 15:24:24 2022 +0800
634
635     add information
636
637 commit 7e366a57d35774f63d6f24dea329ea1601d6824c
638 Author: testno0 <96910593+testno0@users.noreply.github.com>
639 Date: Mon Mar 21 15:23:21 2022 +0800
640
641     moved to /src
642
643 commit 0ee404b8f7220cc004016c7cb5eab5210dd1d94f
644 Author: testno0 <96910593+testno0@users.noreply.github.com>
645 Date: Mon Mar 21 15:22:51 2022 +0800
646
647     moved to /src/bin
648
649 commit 6b405ead38d2630722f54c4052bda0d600962d64
650 Author: testno0 <96910593+testno0@users.noreply.github.com>
651 Date: Mon Mar 21 15:22:22 2022 +0800
652
653     moved to /src/algorithm
654
655 commit 5d17b5bcf12d8cd275d08767aee2ec65b9df9966
656 Author: testno0 <96910593+testno0@users.noreply.github.com>
657 Date: Mon Mar 21 15:21:50 2022 +0800
658
659     moved to src
660
661 commit 5b9d5813d1d80dddc965efc81008ac645250e547
662 Author: testno0 <96910593+testno0@users.noreply.github.com>
663 Date: Mon Mar 21 15:21:19 2022 +0800
664
665     renamed the folder code to src
666
667 commit 2b1813b79ba12a2c7d7485cd0bb72a575bc09b06
668 Author: testno0 <96910593+testno0@users.noreply.github.com>
669 Date: Mon Mar 21 15:20:18 2022 +0800
670
671     Create setup.sh
672

```

```

673 commit 121a8c2bb929dcee5e15d9376e6645570c4b7156
674 Author: testno0 <96910593+testno0@users.noreply.github.com>
675 Date: Mon Mar 21 15:20:01 2022 +0800
676
677     Create code_email.py
678
679 commit 92f12b357c502da20119ed46eedbd071f735d172
680 Author: testno0 <96910593+testno0@users.noreply.github.com>
681 Date: Mon Mar 21 15:16:14 2022 +0800
682
683     Create access.py
684
685 commit 74d488c16403de4ac0edcb7ae45ad665c3d71c8e
686 Author: testno0 <96910593+testno0@users.noreply.github.com>
687 Date: Mon Mar 14 22:29:34 2022 +0800
688
689     upload the methodology pdf
690
691 commit 4bbdbeefb24779e8991c015055dad8eb816c2ffc
692 Author: testno0 <96910593+testno0@users.noreply.github.com>
693 Date: Mon Mar 14 22:28:43 2022 +0800
694
695     Create function.py
696
697 commit 3a0e00de9eb925d00514a11faa5c2a17e67e113c
698 Author: testno0 <96910593+testno0@users.noreply.github.com>
699 Date: Mon Mar 14 22:23:31 2022 +0800
700
701     Create main.py
702
703 commit 4e39c03dbd5bd2678a067c92f973b57213a9dc7b
704 Author: testno0 <96910593+testno0@users.noreply.github.com>
705 Date: Mon Mar 14 22:13:56 2022 +0800
706
707     uploaded algorithm figure
708
709 commit 785ac40abe07b87e35b5e090283611687bb271b0
710 Author: testno0 <96910593+testno0@users.noreply.github.com>
711 Date: Mon Mar 14 22:12:35 2022 +0800
712
713     Create methodology.tex
714
715 commit 9f76350a253e604d943f9ddea7cbb7f094a8bb0
716 Author: testno0 <96910593+testno0@users.noreply.github.com>
717 Date: Sun Mar 13 19:53:41 2022 +0800
718
719     Initial commit
720

```

Listing 15: git log of the development.

While the command log is logged by Bourne Again SHell of GNU, from `.bash_history`, which is exported via redirection of `stdout`.

```

1 1 sudo dnf update
2 2 sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc
3 3 sudo sh -c 'echo -e "[code]\nname=Visual Studio Code\nbaseurl=https://packages.microsoft.com/yumrepos
   /vscode\nenabled=1\nngpgcheck=1\nngpgkey=https://packages.microsoft.com/keys/microsoft.asc" > /etc/yum
   .repos.d/vscode.repo'
4 4 dnf check-update
5 5 sudo dnf install code
6 6 ls
7 7 git clone https://github.com/testno0/capstone
8 8 git clone https://github.com/iaacornus/workstation_setup
9 9 cd workstation_setup/
10 10 ls
11 11 cd
12 12 source .bashrc
13 13 clear

```

```

14 14 cd capstone/
15 15 git pull
16 16 cd
17 17 git clone https://github.com/iaacornus/project_repo
18 18 cd
19 19 clear
20 20 git pull
21 21 cd capstone/
22 22 git pull
23 23 git config --global credential.helper store
24 24 cd
25 25 git clone https://github.com/iaacornus/project_repo
26 26 git config --global credential.helper store
27 27 git pull
28 28 cd capstone/
29 29 git pull
30 30 rm -rf capstone/
31 31 git clone -b devel https://github.com/testno0/capstone
32 32 cd capstone/
33 33 git status
34 34 git add src/algorithm/function.py
35 35 git add .
36 36 git status
37 37 git commit -m "improved syntax and formatting"
38 38 cd
39 39 git config --global user.email "testno0"
40 40 git config --global user.name "testno0"
41 41 git config --global user.email "#####@gmail.com"
42 42 clear
43 43 git config user.email
44 44 git config user.name
45 45 cd capstone/p
46 46 cd capstone/
47 47 git status
48 48 git commit -m "improved syntaxes and formatting"
49 49 clear
50 50 git add README.md
51 51 git status
52 52 git commit -m "add instructions for install"
53 53 cd capstone/
54 54 ls
55 55 cd
56 56 sudo dnf install python3-pip
57 57 clear
58 58 cd capstone/
59 59 pip install -r requirements.txt
60 60 cd
61 61 wget https://raw.githubusercontent.com/testno0/capstone/devel/src/algorithm/function.py
62 62 ls
63 63 cat function.py
64 64 clear
65 65 nano .bashrc
66 66 source .bashrc
67 67 python access.py
68 68 python $PATH/access.py
69 69 access.py
70 70 nano .bashrc
71 71 source .bashrc
72 72 python access.py
73 73 access.py
74 74 nano .bashrc
75 75 source .bashrc
76 76 access.py
77 77 python access.py
78 78 clear
79 79 nano .bashrc
80 80 clear
81 81 nano .bashrc
82 82 source .bashrc
83 83 python access.py
84 84 nano .bashrc
85 85 cd src/system/
86 86 ls

```

```

87 87 mkdir utils
88 88 cd utils/
89 89 touch update.sh
90 90 touch init.sh
91 91 touch password_gen.py
92 92 git status
93 93 git add requirements.txt
94 94 git commit -m "changed opencv2 to opencv-python"
95 95 clear
96 96 git history
97 97 git log
98 98 clear
99 99 touch logs
100 100 git log > logs
101 101 clear
102 102 git status
103 103 git add README.md
104 104 git commit -m "announced the start of phase 2"
105 105 git add logs
106 106 git commit -m "export git log to logs file for traces and documentation"
107 107 clear
108 108 touch test.py
109 109 rm test.py
110 110 touch test.sh
111 111 nano test.sh
112 112 bash test.sh
113 113 nano test.sh
114 114 bash test.sh
115 115 clear
116 116 cd
117 117 git status
118 118 cd capstone/
119 119 git status
120 120 clear
121 121 rm test.sh
122 122 cp ~/.bashrc ~/capstone/src/system/
123 123 git status
124 124 git add src/system/.bashrc
125 125 git commit -m "add bashrc to the system"
126 126 echo \u
127 127 echo $USER
128 128 clear
129 129 git status
130 130 git add src/system/.bashrc
131 131 git commit -m "modified the bashrc" -m "replaced the alias with new alias, fix PS1 to more friendly
    prompt, and removed the other functions"
132 132 clear
133 133 git status
134 134 git add src/system/setup.sh
135 135 git commit -m "fixed the initialized setup script" -m "fixed the dir of the src codes, improved the
    user setup, and fixed the secure setup"
136 136 git status
137 137 clear
138 138 git status
139 139 git diff
140 140 clear
141 141 git status
142 142 git add src/bin/access.py
143 143 git commit -m "improved the accessing algorithm" -m "add backup, same concept with forgot password.
    enforced the trial limit to 3"
144 144 git status
145 145 git add src/system/utils/
146 146 git add src/system/utils/update.sh
147 147 git status
148 148 git restore --staged src/system/*
149 149 git status
150 150 git add src/system/utils/update.sh
151 151 git commit -m "initial src code, integrated the secure access"
152 152 git add src/system/utils/password_gen.py
153 153 git commit -m "add password generator for setup."
154 154 git status
155 155 cd
156 156 cd capstone/ && git pull

```

```

157 157 groupadd hello
158 158 sudo groupadd hello
159 159 cd
160 160 mkdir test
161 161 sudo chown :hello $HOME/test
162 162 sudo chmod g=r,o= $HOME/.att_sys
163 163 sudo chmod g=r,o= $HOME/test
164 164 sudo chmod g+s $HOME/.att_sys
165 165 sudo chmod g+s $HOME/test
166 166 ls
167 167 cat test/
168 168 cd test/
169 169 clear
170 170 sudo chown :hello $HOME/test
171 171 cd
172 172 sudo chown :hello $HOME/test
173 173 cd capstone/
174 174 git status
175 175 git diff
176 176 cd
177 177 cd test/
178 178 git clone https://github.com/testno0/capstone > /dev/null
179 179 ls
180 180 rm -rf capstone/
181 181 git clone https://github.com/testno0/capstone >> /dev/null
182 182 rm -rf capstone/
183 183 git clone https://github.com/testno0/capstone | /dev/null
184 184 clear
185 185 rm -rf capstone/
186 186 git clone https://github.com/testno0/capstone &>/dev/null
187 187 ls
188 188 rm -rf capstone/
189 189 git clone https://github.com/testno0/capstone &>/dev/null
190 190 rm -rf capstone/
191 191 git clone https://github.com/testno0/capstone &> /dev/null
192 192 clear
193 193 cd
194 194 ls
195 195 cd capstone/
196 196 git status
197 197 git commit src/system/utlis/update.sh
198 198 git add src/system/utlis/update.sh
199 199 git commit src/system/utlis/update.sh
200 200 git diff
201 201 git commit -m "enforced the password access, not foolproof, can be easily wrecked by non idiots
    user, but since the user will be idiots, it should work"
202 202 git status
203 203 git add src/bin/access.py
204 204 git restore --staged
205 205 git restore --staged src/bin/access.py
206 206 git status
207 207 git add src/bin/code_email.py
208 208 git commit -m "merged the 2 email functions, and add more information in the msg" -m "the
    informations included are school name, parent, student and teachers name, as well as the time that
    the student logged in"
209 209 git add src/system/setup.sh
210 210 git commit -m "add prompt for school name"
211 211 git add src/bin/access.py
212 212 git commit -m "synchronized with the changes from setup.sh and code_email.py"
213 213 clear
214 214 git status
215 215 git push origin devel
216 216 clear
217 217 git config --global credential.helper store
218 218 git pull
219 219 clear
220 220 git config --global credential.helper store
221 221 cd
222 222 git config --global credential.helper store
223 223 clear
224 224 /bin/python
225 225 clear
226 226     elif access == "student entry"

```

```
227 227 ls
228 228 cd
229 229 ls
230 230 ls -lah
231 231 cd .bash
232 232 cd .bashrc/
233 233 ls
234 234 ls -lah
235 235 mv .bashrc ~
236 236 mv .bashrc ~/.bashrcs
237 237 cd
238 238 rm -rf .bashrc
239 239 mv .bashrcs .bashrc
240 240 source .bashrc
241 241 clear
242 242 ls
243 243 cd
244 244 rm -rf capstone/
245 245 git clone -b devel https://github.com/testno0/capstone
246 246 cd capstone/
247 247 ls
248 248 cd src/
249 249 ls
250 250 cd system/
251 251 ls
252 252 bash setup.sh
253 253 clear
254 254 cd
255 255 ls
256 256 cd devel/capstone/
257 257 ls
258 258 cd src/system/
259 259 ls
260 260 bash setup.sh
261 261 clear
262 262 echo pwd
263 263 pwd
264 264 ls
265 265 bash setup.sh
266 266 clear
267 267 bash setup.sh
268 268 clearclear
269 269 clear
270 270 bash setup.sh
271 271 cd capstone/
272 272 ls
273 273 cd src/system/
274 274 ls
275 275 bash setup.sh
276 276 cd
277 277 git pull
278 278 cd capstone/
279 279 git pull
280 280 cd
281 281 mkdir devel
282 282 cd devel/
283 283 git clone -b devel https://github.com/testno0/capstone
284 284 cd capstone/
285 285 cd
286 286 rm -rf capstone/
287 287 git clone -b devel https://github.com/testno0/capstone
288 288 systemctl status respository-update.service
289 289 cd
290 290 rm -rf capstone/
291 291 git clone -b devel https://github.com/testno0/capstone
292 292 cd devel/capstone/
293 293 ls
294 294 cd src/system/utils/
295 295 ls
296 296 bash update.sh
297 297 cd
298 298 cd devel/capstone/
299 299 ls
```

```

300 300 cd src/
301 301 ls
302 302 python bin/access.py
303 303 git status
304 304 git add .
305 305 git status
306 306 git restore --staged bin/__pycache__/code_email.cpython-310.pyc
307 307 git status
308 308 git restore --staged misc/__pycache__/*
309 309 git status
310 310 git restore *
311 311 git status
312 312 git restore --staged *
313 313 gits status
314 314 git status
315 315 git add algorithm/.
316 316 git status
317 317 git add bin/.
318 318 git commit -m "add the other dir to their path, for successful import"
319 319 git add system/.
320 320 git restore --staged *
321 321 git status
322 322 git add system/setup.sh
323 323 git commit -m "fixed errors"
324 324 pwd
325 325 cd system/utils/
326 326 ls
327 327 bash update.sh
328 328 pwd
329 329 bash update.sh
330 330 clear
331 331 ls
332 332 echo
333 333 bash update.sh
334 334 clear
335 335 bash update.sh
336 336 pwd
337 337 bash update.sh
338 338 python $HOME/devel/capstone/src/bin/access.py
339 339 ls
340 340 mv update.sh update.py
341 341 git statis
342 342 git status
343 343 git add update.
344 344 git commit -m "rewrite into python file, since $ret can't make interactive eval of access.py"
345 345 clear
346 346 python update.py
347 347 clear
348 348 cd ..
349 349 ls
350 350 bash setup.sh
351 351 /bin/python /home/test/devel/capstone/src/bin/access.py
352 352 pwd
353 353 cd src/misc/
354 354 touch __init__.py
355 355 /bin/python /home/test/devel/capstone/src/bin/access.py
356 356 clear
357 357 /bin/python /home/test/devel/capstone/src/bin/access.py
358 358 cd misc
359 359 ls
360 360 cd ..
361 361 cd misc/
362 362 touch __init__.py
363 363 /bin/python
364 364 c;ear
365 365 clear
366 366 ls
367 367 cd devel/capstone/
368 368 ls
369 369 cd src/
370 370 git status
371 371 git add system/utils/update.py
372 372 git diff

```



```

373 373 git commit -m "removed update.sh and replaced with update.py"
374 374 git status
375 375 git add bin/access.py
376 376 git commit -m "changed the sys.append"
377 377 git add system/utils/password_gen.py
378 378 git commit -m "fixed the formatting"
379 379 git add system/utils/update.sh
380 380 git commit -m "replaced with update.py"
381 381 git status
382 382 git push origin devel
383 383 ls
384 384 bash system/setup.sh
385 385 ls
386 386 cd system/utils/
387 387 ls
388 388 bash test.sh
389 389 nano test.sh
390 390 bash test.sh
391 391 nano test.sh
392 392 bash test.sh
393 393 clear
394 394 bash test.sh
395 395 clear
396 396 rm test.sh
397 397 ls
398 398 cd ..
399 399 ls
400 400 git status
401 401 git add setup.sh
402 402 git commit -m "evaluators were fixed, as well as feedbacks"
403 403 git add utils/password_gen.py
404 404 git commit -m "print was used instead of return to store the variable in bash script"
405 405 git add utils/update.py
406 406 git commit -m "removed the accidental import"
407 407 clear
408 408 git push origin devel
409 409 ls
410 410 bash setup.sh
411 411 bash $HOME/.att_sys/system/utils/update.py
412 412 python $HOME/.att_sys/system/utils/update.py
413 413 clear
414 414 cd
415 415 ls
416 416 cd capstone/
417 417 cd
418 418 rm -rf capstone/
419 419 git clone https://github.com/testno0/casptone
420 420 git clone -b devel https://github.com/testno0/capstone
421 421 cd
422 422 ls
423 423 cd capstone/
424 424 ls
425 425 cd src/system/utils/
426 426 ls
427 427 systemctl status repository-check.service
428 428 clear
429 429 cd
430 430 nano test.sh
431 431 bash test
432 432 bash test.sh
433 433 cd
434 434 clear
435 435 ls
436 436 rm -rf capstone/
437 437 git clone -b devel https://github.com/testno0/capstone
438 438 rm -rf capstone/
439 439 git clone -b devel https://github.com/testno0/capstone
440 440 clear
441 441 /bin/python /home/test/devel/capstone/test.py
442 442 bash test.sh
443 443 cd devel/
444 444 cd capstone/src/
445 445 ls

```

```
446 446 python bin/access.py
447 447 clear
448 448 clear
449 449 python bin/access.py
450 450 clear
451 451 python bin/access.py
452 452 /bin/python
453 453 clear
454 454 /bin/python /home/test/devel/capstone/src/bin/access.py
455 455 cd devel/capstone/
456 456 ls
457 457 git status
458 458 status
459 459 clear
460 460 git status
461 461 rm .git/index
462 462 git status
463 463 git diff
464 464 clear
465 465 git pull
466 466 cd ..
467 467 rm -rf capstone/
468 468 git clone -b test-v1-beta https://github.com/testno0/capstone
469 469 cd capstone/
470 470 python src/bin/access.py
471 471 clear
472 472 python src/bin/access.py
473 473 cd devel/capstone/
474 474 python src/bin/access.py
475 475 clear
476 476 python src/bin/access.py
477 477 ls
478 478 python -n src/*
479 479 python -m src/*
480 480 cd src/
481 481 ls
482 482 python -m algorithm.main
483 483 python -m algorithm.function
484 484 python -m algorithm.main
485 485 python main.py
486 486 ls
487 487 python algorithm/main.py
488 488 cd ..
489 489 ls
490 490 cd src/
491 491 python -m bin.code_email
492 492 python algorithm/main.py
493 493 pwd
494 494 touch __init__.py
495 495 python algorithm/main.py
496 496 python bin/access.py
497 497 clear
498 498 python bin/access.py
499 499 python algorithm/main.py
500 500 clear
501 501 ls
502 502 git status
503 503 cd ..
504 504 ls
505 505 cd ..
506 506 ls
507 507 mkdir cli
508 508 cd cli/
509 509 git clone -b test-v1-beta https://github.com/testno0/capstone
510 510 clear
511 511 /bin/python /home/test/devel/capstone/src/bin/access.py
512 512 pwd
513 513 cd src/
514 514 touch bin/__init__.py
515 515 /bin/python /home/test/devel/capstone/src/bin/access.py
516 516 /bin/python /home/test/devel/capstone/src/bin/code_email.py
517 517 clear
518 518 touch misc/__init__.py
```

```

519 519 /bin/python /home/test/devel/capstone/src/bin/access.py
520 520 clear
521 521 /bin/python /home/test/devel/capstone/src/bin/access.py
522 522 clear
523 523 /bin/python /home/test/devel/capstone/src/bin/access.py
524 524 clear
525 525 /bin/python /home/test/devel/capstone/src/bin/access.py
526 526 touch algorithm/__init__.py
527 527 pwd
528 528 touch cli.py
529 529 rm -rf algorithm/
530 530 cd devel/cli/capstone/
531 531 ls
532 532 cd src/
533 533 cd
534 534 nano .bashrc
535 535 source .bashrc
536 536 cd devel/cli/capstone/
537 537 cd src/
538 538 git status
539 539 git diff
540 540 git add bin/access.py
541 541 git restore --staged bin/access.py
542 542 git status
543 543 ls
544 544 python algorithm/main.py
545 545 python algorithm/function.py
546 546 gita add algorithm/function.py
547 547 git add algorithm/function.py
548 548 git add algorithm/main.py
549 549 git status
550 550 git add bin/access.py
551 551 git commit -m "fixed imports"
552 552 git add __init__.py bin/__init__.py misc/__init__.py
553 553 git commit -m "this was added to allow relative imports"
554 554 git status
555 555 git add ../.gitignore
556 556 git commit -m "add another dir for .gitignore"
557 557 git push origin test-v1-beta
558 558 git config --global credential.helper store
559 559 clear
560 560 pwd
561 561 cd src/
562 562 ls
563 563 touch misc/__init__.py bin/__init__.py
564 564 touch __init__.py
565 565 pwd
566 566 cd devel/capstone/
567 567 git pull
568 568 cd ..
569 569 rm -rf capstone/
570 570 ls
571 571 git clone -b test-v1-beta https://github.com/testno0/capstone
572 572 ls
573 573 cd capstone/
574 574 ls
575 575 git checkout -b cli
576 576 ls
577 577 cd src/
578 578 mv algorithm/* .
579 579 ls
580 580 rm -rf algorithm/
581 581 touch cli.py
582 582 touch utils.py
583 583 git status
584 584 git add cli.py
585 585 git commit -m "created cli for the program"
586 586 git add function.py main.py
587 587 git commit -m "moved to src/ instead of src/algorithm" -m "this was done for easier navigation of
the application"
588 588 git add system/pre_setup.sh
589 589 git commit -m "isolated the system setup from user setup, due to the options made in cli program" -
m "since having to redo all the steps may brick the system and is too trivial and troublesome"

```

```

590 590 git status
591 591 git add system/user_setup.sh
592 592 git commit -m "used for -s option in cli.py"
593 593 git add system/.bashrc
594 594 git commit -m "removed the .bashrc, since alias aren't needed anymore as the options were unified
    in cli.py"
595 595 git add system/utls/update.py
596 596 git commit -m "turned into function, so can be easily called from cli.py"
597 597 git status
598 598 git add algorithm/*
599 599 git add algorithm
600 600 git status
601 601 git commit -m "moved into src/"
602 602 git add system/setup.sh
603 603 git commit -m "splited into user_setup.sh and pre_setup.sh"
604 604 git status
605 605 git push origin cli
606 606 git diff
607 607 git add system/user_setup.sh
608 608 git commit -m "moved the user setup part from setup.sh"
609 609 ls
610 610 python cli.py -u
611 611 python cli.py
612 612 clear
613 613 python cli.py
614 614 clear
615 615 python cli.py
616 616 clear
617 617 python cli.py 0u
618 618 python cli.py -u
619 619 python cli.py -U
620 620 /bin/python /home/test/devel/capstone/src/main.py
621 621 cd devel/capstone/src/
622 622 ls
623 623 python cli.py -U
624 624 cd devel/capstone/src/
625 625 clear
626 626 python cli.py --update
627 627 clear
628 628 python cli.py --setup
629 629 git status
630 630 git add system/.bashrc
631 631 git commit -m "aliased python cli.py to taptap instead of creating a setup.py script"
632 632 cd ..
633 633 ls
634 634 rm -rf tests/
635 635 git status
636 636 git add tests
637 637 git status
638 638 git commit -m "removed tests folder since it is nonsensical"
639 639 git status
640 640 git rm --cached */__pycache__/*
641 641 git status
642 642 git ad .gitignore
643 643 git add .gitignore
644 644 git restore --staged .gitignore
645 645 git add .gitignore
646 646 git commit -m "removed other entries"
647 647 git status
648 648 git rm src/bin/__pycache__/code_email.cpython-310.pyc
649 649 git rm -f src/bin/__pycache__/code_email.cpython-310.pyc
650 650 git status
651 651 git restore --staged src/bin/__pycache__/
652 652 git status
653 653 git diff
654 654 git add src/system/utls/update.py
655 655 git commit -m "fixed imports and conditions"
656 656 git status
657 657 git add src/function.py
658 658 git commit -m "fixed the setup() function" -m "other information were instead retrieved from the
    user file info instead of being a parameter"
659 659 git diff
660 660 git add src/bin/access.py

```

```

661 661 git commit -m "fixed the output as well as exception handling, and variable ref"
662 662 git status
663 663 clear
664 664 git push origin cli
665 665 python cli.py -U
666 666 cd src/
667 667 python cli.py -U
668 668 python cli.py -u
669 669 python cli.py -h
670 670 cd ..
671 671 git log
672 672 git log > logs
673 673 git status
674 674 git add logs
675 675 git commit -m "reexported the logs as of may 01, 2022 @ 20:48"
676 676 git add README.md
677 677 git commit -m "add info about merging plan, and documentation of cli"
678 678 clear
679 679 git push origin cli
680 680 clear
681 681 git status
682 682 git diff
683 683 git status
684 684 cd src/
685 685 git add system/.bashrc
686 686 git commit -m "changed the dir of alias"
687 687 git add system/user_setup.sh
688 688 git commit -m "used > redirection to avoid errors"
689 689 git add system/pre_setup.sh
690 690 git commit -m "fixed the system structure and add chmod to the script to easily execute the script"
691 691 git status
692 692 git add bin/code_email.py
693 693 git commit -m "changed the message if the student is present"
694 694 clear
695 695 git diff
696 696 python cli.py --use
697 697 cd
698 698 ls
699 699 cd .att_sys/
700 700 ls
701 701 cat user_info
702 702 cd
703 703 cp .bashrc ~/devel/capstone/src/system/
704 704 git status
705 705 cd devel/capstone/src/
706 706 clear
707 707 git status
708 708 git diff
709 709 python cli.py --use
710 710 cd
711 711 cat .att_sys/user_info
712 712 cd devel/capstone/src/
713 713 python cli.py --use
714 714 /bin/python /home/test/devel/capstone/src/main.py
715 715 cd
716 716 cat .att_sys/user_info
717 717 clear
718 718 python cli.py --destroy
719 719 git status
720 720 git add cli.py
721 721 git diff
722 722 git commit -m "tested and add commands"
723 723 git status
724 724 git add main.py
725 725 git status
726 726 git commit -m "satisfied the requirements of imports from code_email and function.py"
727 727 git add function.py
728 728 git commit -m "the loop bug were removed, the trial limit were also barred into 3" -m "the feedback
were also changed"
729 729 git push origin cli
730 730 ls ~
731 731 ls ~ | less
732 732 less < ls '

```

```

733 733 less < ls ~
734 734 less < $(ls ~)
735 735 less test.sh
736 736 cat > test.sh
737 737 cat < test.sh > hello.txt
738 738 cat hello.txt
739 739 cat test
740 740 cat test.sh
741 741 echo "hello" > test.sh
742 742 echo "hello" > test.sh
743 743 cat test.sh
744 744 cat < test.sh > hello.txt
745 745 cat hello.txt
746 746 cat test.sh | less
747 747 less < cat test.sh
748 748 ls
749 749 ls | tee hello.txt
750 750 cat hello.txt
751 751 env
752 752 echo 'The quick brown; fox jumps over the lazy dog' > sample.txt
753 753 cut -c 5 sample.txt
754 754 cut -f 2 sample.txt
755 755 cut -c -5 sample.txt
756 756 cut -c 5- sample.txt
757 757 cut -f 2 sample.txt
758 758 nano sample.txt
759 759 cut -f 2 sample.txt
760 760 cut -f 1 -d ";" sample.txt
761 761 nano sample.txt
762 762 cut -c 1 sample.txt
763 763 cut -c 1-10 sample.txt
764 764 journalctl -xb
765 765 journalctl -xb | head
766 766 clear
767 767 journalctl -xb | head
768 768 clear
769 769 journalctl -xb | tail -f
770 770 tail -f /var/log/syslog
771 771 journalctl -xb > log.txt
772 772 tail -f log.txt
773 773 pip install face_recognition
774 774 sudo dnf install cmake
775 775 pip install face_recognition
776 776 cmake
777 777 pip3 install face_recognition
778 778 sudo dnf install python3-dlib
779 779 pip3 install face_recognition
780 780 dnf list installed | grep -i "python.dlib"
781 781 dnf list installed | grep -i "python3-dlib"
782 782 dnf list installed | grep -i "python.-dlib"
783 783 cp -h
784 784 cp --help
785 785 cp --help | grep -i "-r"
786 786 cp --help | grep -i "r"
787 787 clear
788 788 cp --help | grep -i "r"
789 789 clear
790 790 mkdir .att_sys
791 791 cd devel/capstone/
792 792 status
793 793 git status
794 794 add requirements.txt
795 795 git add requirements.txt
796 796 git commit -m "add face_recognition as requirements and removed cv2"
797 797 add src/system/pre_setup.sh
798 798 git add src/system/pre_setup.sh
799 799 git commit -m "simplified the src code moving into the app folder"
800 800 clear
801 801 git log > logs
802 802 status
803 803 git status
804 804 git add logs
805 805 diff

```

```

806 806 git diff
807 807 clear
808 808 git commit -m "add the new commits"
809 809 clear
810 810 history > command_logs
811 159 lsblk
812 160 sudo wipefs -a /dev/sdc
813 161 sudo umount /dev/sdc
814 162 sudo umount /dev/sdc1
815 163 sudo wipefs -a /dev/sdc
816 164 lsblk
817 165 sudo gdisk /dev/sdc
818 166 clear
819 167 sudo mkfs.ext4 /dev/sdc1
820 168 cd temporary/
821 169 git clone -b face_recog https://github.com/testno0/capstone
822 170 cd temporary/capstone/
823 171 touch rfid/main2.cpp
824 172 flatpak install flathub org.gnome.Cheese
825 173 sudo dnf install cmake
826 174 source venv/bin/activate
827 175 source venv/bin/activate
828 176 pip install -r requirements.txt
829 177 sudo dnf install cmake
830 178 sudo dnf install python3-dlib
831 179 pip install -r requirements.txt
832 180 sudo dnf install gcc-c++
833 181 clear
834 182 pip install -r requirements.txt
835 183 clear
836 184 sudo dnf install openblas
837 185 sudo dnf install openblas
838 186 pip install -r requirements.txt
839 187 sudo pip install -r requirements.txt
840 188 sudo pip3 install -r requirements.txt
841 189 pip install
842 190 sudo pip install -r requirements.txt
843 191 sudo python3-pip install -r requirements.txt
844 192 clear
845 193 exit
846 194 cd temporary/capstone/
847 195 clear
848 196 source venv/bin/activate
849 197 clear
850 198 pip install -r requirements.txt
851 199 deactivate
852 200 toolbox enter
853 201 exit
854 202 source venv/bin/activate
855 203 clear
856 204 ssh icq-relationship-photographic-knew.trycloudflare.com
857 205 exit
858 206 cd temporary/capstone/
859 207 pull
860 208 ls
861 209 python -m venv venv
862 210 source venv/bin/activate
863 211 clear
864 212 deactivate
865 213 toolbox enter
866 214 htop
867 215 exit
868 216 source venv/bin/activate
869 217 clear
870 218 pip install -r requirements.txt
871 219 clear
872 220 python src/tests/fr_test.py
873 221 clear
874 222 pip install face_recognition
875 223 python -m pip install --upgrade pip
876 224 pip install face_recognition
877 225 sudo dnf install python-devel
878 226 pip install face_recognition

```

```

879 227 clear
880 228 pip install -r requirements.txt
881 229 clear
882 230 python src/tests/fr_test.py
883 231 python src/tests/fr_test2.py
884 232 python src/tests/fr_test.py
885 233 pip install python-cv2
886 234 pip install opencv2-python
887 235 pip install opencv-python
888 236 deactivate
889 237 exit
890 238 clear
891 239 cd temporary/capstone/
892 240 clear
893 241 toolbox enter
894 242 clear
895 243 cd temporary/capstone/
896 244 status
897 245 commit -m "fixed the while loop"
898 246 source /var/home/iaacornus/temporary/capstone/venv/bin/activate
899 247 /var/home/iaacornus/temporary/capstone/venv/bin/python /var/home/iaacornus/temporary/capstone/src/
900 248 tests/fr_test.py
901 249 toolbox enter
902 250 deactivate
903 251 toolbox enter
904 251 htop
905 252 cat .git-credentials
906 253 git config --global commit.gpgsign true
907 254 cd Development/workstation_setup/
908 255 ls
909 256 nano silverblue_setup.md
910 257 status
911 258 add silverblue_setup.md
912 259 commit -m "little changes"
913 260 git config user.name
914 261 clear
915 262 git config user.signingkey
916 263 commit -m "little changes"
917 264 killall gpg-agent
918 265 commit -m "little changes"
919 266 clear
920 267 git config --global rebase.autoStash true
921 268 clear
922 269 cd temporary/capstone/
923 270 status
924 271 commit -m "fixed while loops"
925 272 add src/bin/*
926 273 status
927 274 commit -m "face recognition pycache"
928 275 add src/face_recog.py src/tests/fr_test.py
929 276 commit -m "successful face recognition build"
930 277 clear
931 278 add sample/
932 279 commit -m "face sample for testing"
933 280 status
934 281 add rfid/main2.cpp
935 282 commit -m "another rfid build"
936 283 diff
937 284 add src/function.py
938 285 commit -m "add av_cam function to simplify face_recognition.py"
939 286 clear
940 287 push origin face_recog
941 288 pull face_recog https://github.com/testno0/capstone
942 289 pull face_recog https://github.com/testno0/capstone
943 290 pull
944 291 push origin face_recog
945 292 git pull
946 293 git rebase
947 294 git pull
948 295 git rebasels
949 296 rebase face_recog
950 297 lbranch
951 298 git checkout face_recog

```



```

951 299 ls
952 300 ls rfid/
953 301 git stash
954 302 git reset --merge
955 303 git stash
956 304 git checkout face_recog
957 305 status
958 306 push origin face_recog
959 307 pull
960 308 pull face_recog
961 309 pull https://github.com/testno0/capstone face_recog
962 310 push
963 311 git pull --rebase
964 312 git pull --rebase origin face_recog
965 313 rm -fr ".git/rebase-merge"
966 314 git pull --rebase origin face_recog
967 315 push origin main
968 316 clear
969 317 status
970 318 git rebase --skip
971 319 status
972 320 push origin face_recog
973 321 history
974 322 sudo dnf clean all
975 323 sudo dnf autoremove
976 324 clear
977 325 exit
978 326 toolbox enter
979 327 history | grep install
980 328 flatpak list
981 329 flatpak uninstall --system --delete-data org.gnome.Cheese
982 330 flatpak uninstall --unused
983 331 flatpak repair
984 332 clear
985 333 toolbox enter
986 334 toolbox list
987 335 toolbox rmi fedora-toolbox-35
988 336 toolbox rm -a
989 337 killall toolbox
990 338 toolbox rm -a
991 339 toolbox list
992 340 toolbox rm -a
993 341 toolbox rm fedora-toolbox-35
994 342 cd temporary/capstone/
995 343 ls
996 344 log
997 345 log >> logs
998 346 log > logs
999 347 history >> command_logs

```

Listing 16: Command history

The source codes are verifiable using sha256sum command:

```

1 git clone https://github.com/testno0/capstone
2 tar -cvzf capstone/
3 echo -e "shasum=$(sha256sum capstone.tar*)\nif [[ $shasum = <shasum> ]]; then\n\techo '> Passed.'\nelse\n\techo '> Shasum doesn't match.'\nfi" > test.sh
4 chmod +x test.sh
5 ./test.sh

```

Listing 17: Checking of cryptographic hash of source codes before use.