CS3052 - Computer Security

Continuous assessment 02

Protection of Information based on sensitivity and privilege levels

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Privilege Levels

Doctor - 1

- Can modify any of patients record
- Can read all patient records
- Can read data based on the patient name
- Can add new patient data record

Nurse - 2

- Can modify only the personal data of patients
- Can read all patient records
- Can read data based on the patient name
- Can add new patient data records (Only the personal details)

Lab Assistant - 3

- Can modify only the lab prescription
- Can read all patient records
- Can read data based on the patient name

Patient - 4

- Can read his/her data
- Cannot modify his own data
- Cannot read others data records

Sensitivity of Data

All the data records are important. But in terms of medical perspective, the sensitivity of drug prescription and details of the sickness details are more important. So the doctor has the privilege to modify and read those sensitive data.

Lab tests also have a higher amount of sensitivity. But most of the lab works are done by lab assistance and modification rights of lab test data have to be given to the lab assistance as well. So for lab test data both the lab assistant and the doctor has the privilege.

For modification of the personal data, the nurse and the doctor has access.

A patient himself has no access to modify his/her data.
A patient can see their record. But cannot modify. Even patients cannot see others' data.

Workflow

Register

```
> python3 main.py

Welcome to the System

Already Registered to the system? [Yes(y)/No(n)]: n

REGISTER

Username: kamal
Password: 1234

Staff or Patient? [Staff(s)/Patient(p)]: s

Enter you profession? [Doctor(D)/Nurse(N)/LabAssistance(L): d

Successfully registered.Please login to proceed!
```

Login

```
LOGIN

Username: kamal
Password: 1234

Successfully logged In

Hi kamal

What kind of action do you want to do
Enter your action [Read(r)/Write(w)]: 
```

Read Data

```
Hi kamal

What kind of action do you want to do
Enter your action [Read(r)/Write(w)]: r
Do you want to see all the patients records? [y/n]: y
{'name': '', 'age': '', 'sickness_details': '', 'drug_prescription': 'day and night', 'lab_test_prescription': 'good', 'updated_by': 'dasith'}
{'name': 'patient1', 'age': '45', 'sickness_details': 'heart problem', 'drug_prescription': 'idk', 'lab_test_prescription': 'okay', 'updated_by':
'dasith'}
{'name': 'patient2', 'age': '63', 'sickness_details': '', 'drug_prescription': '', 'lab_test_prescription': '', 'updated_by': 'nurse'}
{'name': 'patient3', 'age': '46', 'sickness_details': '', 'drug_prescription': '', 'lab_test_prescription': '', 'updated_by': 'nurse'}
{'name': 'patient4', 'age': '56', 'sickness_details': 'not covid', 'drug_prescription': '', 'lab_test_prescription': 'pass', 'updated_by': 'nurse'
}
{'name': 'patient5', 'age': '49', 'sickness_details': '', 'drug_prescription': '', 'lab_test_prescription': '', 'updated_by': 'nurse'}
{'name': 'patient6', 'age': '', 'sickness_details': 'not covid-19', 'drug_prescription': 'steaming is important', 'lab_test_prescription': '{"FBC"
:normal,"fasting blood suagr":"noraml"}', 'updated_by': 'Kamal'}
```

Update Data

```
Do you need more actions to made? [Y/N]: y
Read or Write? [R/W]: w

You allowed to change the patients all data

New Patient or Existing Patient? [New(n)/Existing(E)]: e
patient name: patinet6
No record found

Do you need more actions to made? [Y/N]: y
Read or Write? [R/W]: w

You allowed to change the patients all data

New Patient or Existing Patient? [New(n)/Existing(E)]: e
patient name: patient6
{'name': 'patient6', 'age': '', 'sickness_details': 'not covid-19', 'drug_prescription': 'steaming is important', 'lab_test_prescription': '{"FBC"
:normal,"fasting blood suagr":"noraml"}', 'updated_by': 'Kamal'}
Do you want to add/change the patients data? [Y/N]: y
name:
age: 45
sickness details:
Drug prescription:
lab test data: {FBC:noraml,FBS:high}

Do you need more actions to made? [Y/N]: y
Read or Write? [R/W]: r
Do you want to see all the patients records? [y/n]: n
Enter Patient Name to get details: patient6
{'name': 'patient6', 'age': '45', 'sickness_details': 'not covid-19', 'drug_prescription': 'steaming is important', 'lab_test_prescription': '{FBC
:noraml,FBS:high}', 'updated_by': 'kamal'}

Do you need more actions to made? [Y/N]: n
Thank You.
```
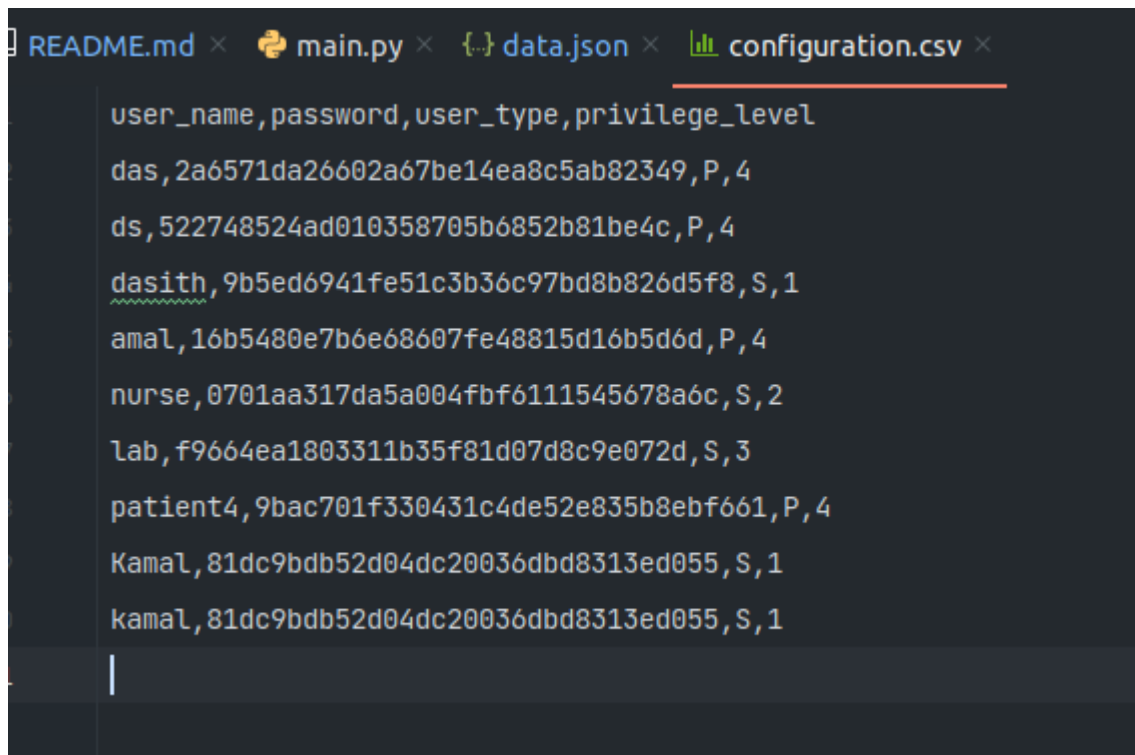
Here when a user enters the wrong username system will detect it and alert him.

Above registered user is a doctor. He has access to read and modify all the data.
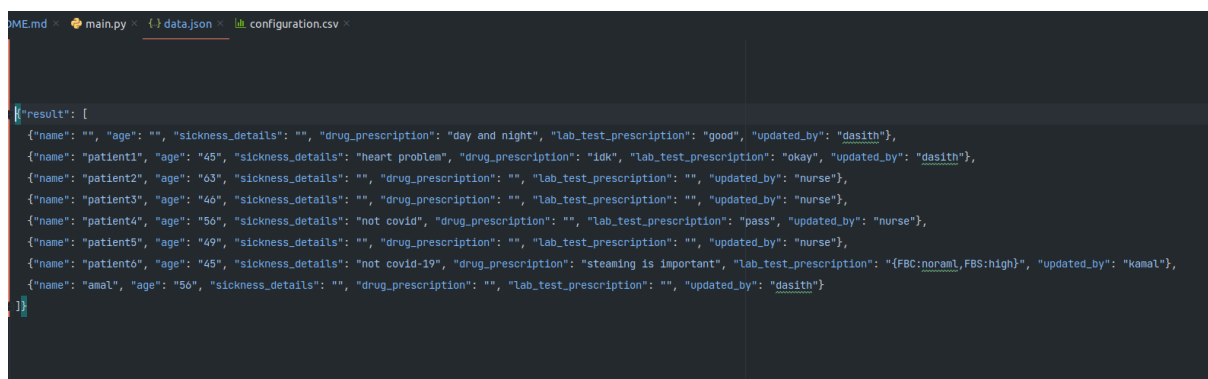
Annexes

Configuration.csv

- CSV file format has been used for the handle configuration file
- CSV files are handled by pandas

```
README.md ×    main.py ×  {..} data.json ×    configuration.csv ×

      user_name,password,user_type,privilege_level

      das,2a6571da26602a67be14ea8c5ab82349,P,4

      ds,522748524ad010358705b6852b81be4c,P,4

      dasith,9b5ed6941fe51c3b36c97bd8b826d5f8,S,1

      amal,16b5480e7b6e68607fe48815d16b5d6d,P,4

      nurse,0701aa317da5a004fbf6111545678a6c,S,2

      lab,f9664ea1803311b35f81d07d8c9e072d,S,3

      patient4,9bac701f330431c4de52e835b8ebf661,P,4

      Kamal,81dc9bdb52d04dc20036dbd8313ed055,S,1

      kamal,81dc9bdb52d04dc20036dbd8313ed055,S,1
```

Data.json

The JSON file format has been used to record patient data

```
DME.md ×   main.py ×  {..} data.json ×    configuration.csv ×

{"result": [
  {"name": "", "age": "", "sickness_details": "", "drug_prescription": "day and night", "lab_test_prescription": "good", "updated_by": "dasith"},
  {"name": "patient1", "age": "45", "sickness_details": "heart problem", "drug_prescription": "idk", "lab_test_prescription": "okay", "updated_by": "dasith"},
  {"name": "patient2", "age": "63", "sickness_details": "", "drug_prescription": "", "lab_test_prescription": "", "updated_by": "nurse"},
  {"name": "patient3", "age": "46", "sickness_details": "", "drug_prescription": "", "lab_test_prescription": "", "updated_by": "nurse"},
  {"name": "patient4", "age": "56", "sickness_details": "not covid", "drug_prescription": "", "lab_test_prescription": "pass", "updated_by": "nurse"},
  {"name": "patient5", "age": "49", "sickness_details": "", "drug_prescription": "", "lab_test_prescription": "", "updated_by": "nurse"},
  {"name": "patient6", "age": "45", "sickness_details": "not covid-19", "drug_prescription": "steaming is important", "lab_test_prescription": "{FBC:noraml,FBS:high}", "updated_by": "kamal"},
  {"name": "amal", "age": "56", "sickness_details": "", "drug_prescription": "", "lab_test_prescription": "", "updated_by": "dasith"}
]}
```