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WJEC A2 Computer Science Coursework Programmed Solution to a Problem

*Section 1 - Discussion*

Identification of the Problem

I will be computerising a system for Meigh Pharmacy for my Unit 5 coursework. The Pharmacy is one of four privately owned Pharmacies, that offer a wide range of medical services from highly trained professionals, as well as retail services. It is based in Meigh, a small town outside of the city of Newry, Northern Ireland. Their services are offered to both private patients and NHS patients.

The Pharmacy offers a wide range of services such as:

* Dispensing of NHS Prescriptions
* Vaccinations
* Passport Registration
* Non-Prescription Medicine
* Blood Testing (includes Blood pressure testing, and Blood sugar levels)
* Pharmacy Shop
* Pharmacist Check-ups

In terms of Staff currently Meigh Pharmacy have:

* 2 Registered NHS Pharmacists (1 with over 17 years’ experience)
* 4 Registered NHS Nurses
* 2 Pharmaceutical Assistants
* 1 Retail Assistant

The pharmacy recently hired more nurses to help with the increase of medical and travel vaccinations such as the Malaria vaccination. The pharmacy also has a large influx of daily customers in need of their vital services.

They have seen an increase in the number of new customers due to the increase in demand of the Covid-19 Vaccination.

Currently the Pharmacy records their customer and patient information and medical records either in person or over the telephone, collecting the details on a paper-based system. Their Medical and This had led to specific medical records only being able to be viewed in person and the pharmacy would like to move them to an electronic storing method in order to access their records remotely, and to be more time efficient. Their stock of retail items and stock of medicines is currently being managed through a Microsoft excel spreadsheet, which has led to inefficiency and cost, due to recorded stock levels and actual stock levels being different.

In the past a paper-based system was highly regarded however overtime a number of critical issues have been made apparent, such as lack of storage space, illegible handwriting, security issues, high cost, difficulty in editing or updating patient records and the paper-based system being prone to damage.

Therefore, due to both the poor storage methods and the new influx of customers, the pharmacy is experiencing major issues in organisation and structure, leading to an increase in cost and a lack of efficiency. This is very important as many customers rely on the pharmacy for vital and possible life-saving prescriptions.

When discussing a solution to this problem I have decided upon the following data entities that will be included in my solution:

* Pharmacists who prescribe medicine and diagnose patients
* Nurses who complete vaccines
* Different medicine available and their stock
* Pharmacy shop stock and their prices
* Patients/customers of the pharmacy
* Bookings of vaccines

My solution to the problem will ensure that all these data entities have been considered and that the data in my solution will relate to these entities. There will also be certain access levels for data relating to the patient/customer as their data is private, sensitive and must be protected under the Data Protection Act 1998. The pharmacists and nurses will have access to all Data while the customers will only be able to access data relating to themselves.

Aims of the project

Below I have defined what functions I hope to achieve with my solution:

* Secure Login system to the database
* Add new patients (set up a new record)
* View all patients records
* Amend current patient records
* Delete patient records
* Input New Staff data (Add pharmacists, nurses, assistants or retail staff)
* View Staff data
* Amend Staff data (including deleting Staff data)
* Creating Bookings for vaccines
* Amending bookings
* Contain different access levels
* Contain an easy-to-use graphical user interface

For my solution I will be programming my solution in the Python programming language using python 3.8, and using visual studio as an IDLE. I have also chosen to include GUI in my solution as I believe this will greatly increase the proficiency of the system and will make the system easy-to-use for all users will little training needed compared to learning certain commands for a CLI interface.

Although a GUI interface is much harder to program compared to a CLI, it should preform faster than the CLI for all sets of data and therefore will be more efficient and applicable to the pharmacy.

For my solution I will also use sqlite3 to code a database to store all my data. It is appropriate for my solution as it allows for a number of different data types that will be needed such as:

* Integers
* Boolean
* Date
* Currency
* Real

This will help to validate data and improve the overall functionality and security of the system

Limitations

* Too many validations required as all of the data (especially patient data) must be accurate and up-to-date
* Limited timeframe to complete my solution, therefore the timeframe allocated may not be enough to program all of the features of my solution and therefore may impact the overall project design and functionality
* Software Restrictions – Python is a basic CLI programming language and therefore it will make it difficult and complicated to code for certain aspects of my solution, such as the Graphical user interface and the Login system
* Patient Data security – I intend to protect New patient records by encrypting the data before storing the data in the database, however this could be too time consuming and possibly too complex to program.
* Other pharmacies and the NHS would have to know about the system itself in order to interact with Meigh Pharmacy and deliver certain medicines. Could possibly Advertise the solution on social media to make it more widely available.

Feedback

Below is a PowerPoint I presented to outline the problems of the current system



















I used a QR code at the end of PowerPoint to record feedback and I have since analysed the feedback and summarised it in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Questions Asked | Feedback Response | Accept/Reject | Justification |
| Is there any other way could optimise my solution? | Make sure the system works most efficiently on the pharmacy’s current hardware | Reject | In order for future compatibility, I would need to make the solution available to many devices and possible new hardware. |
|  | Create a login system for the solution | Accept | It would make multiple levels of access easier to code and would add another level of data security |
|  | Ensure there is different access levels when viewing data | Accept | A nurse would not need to see all the patients data, only certain parts that are legally required, however the pharmacist will need all the patient data |
| Is there any other Limitations to the project? | There could be too many validations to account for | Reject | There would be a large number of data entities to validate for but this could be solved through variable programming |
|  | A GUI may be too complex to code in the allocated timeframe | Reject | A GUI would be much more efficient than a CLI and through the use of TKinter, and the use of functions. A CLI interface would also be too inefficient for the pharmacy’s needs |
| Do you believe there should be any more added or changed to the management requirements? | Data encryption isn’t necessary and is too complex | Reject | The encryption of patient data adds an extra level of security that is vital when dealing with sensitive information. |
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