

GRADE 12 IT PAT Phase 4 2020



CLIFTON

Scholarship

Leadership

Sportsmanship

Community

Figure 1 (School, 2017)



home affairs

Department:
Home Affairs
REPUBLIC OF SOUTH AFRICA

Figure 2 (Coetzee, 2018)

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Contents

1	Externally Sourced Code	3
	The Database Manager Class	3
2	Explanations of Critical Algorithms	4
	Creating a booking	4
	Explanation:	5
	Booking a SmartID	6
	Explanation:	8
3	Advanced Techniques	9
	Menu Bars	9
	Ghost Text	9
	Help Button	9
	Using photos	9
4	Test Plan and Results	10
	Login Screen	10
	Edit Details2 Screen	11
	PastApplicant's Screen	11
	Table Of Results	12
5	Bibliography	13

1 Externally Sourced Code

Whilst completing phase 3 of my PAT, I have included code which was found externally to make my program work better.

The Database Manager Class

This class is used to access and modify my tables in the Access Database, my IT teacher provided the class needed to connect to the database.

```
public class DatabaseManager {

    Connection conn = null;

    public DatabaseManager() {
        String filename = "HomeAffairs.accdb";
        try {
            if (filename.endsWith(".mdb") || filename.endsWith(".accdb")) {
                String url = "jdbc:ucanaccess://" + filename;
                conn = DriverManager.getConnection(url);
            } else {
                throw new FileNotFoundException();
            }
            System.out.println("Connection successful");
        } catch (Exception e) {
            System.out.println("Failed to get connection");
            e.printStackTrace();
        }
    }

    //Queries the database
    public ResultSet queryDatabase(String sql) throws SQLException {
        Statement stmt = conn.createStatement();
        return stmt.executeQuery(sql);
    }

    //Updates the tables in the database
    public void updateDatabase(String sql) throws SQLException {
        Statement stmt = conn.createStatement();
        stmt.execute(sql);
    }
}
```

This class was used to allow the connection between my manager classes and tables so the program could access the data and function properly.

2 Explanations of Critical Algorithms

Creating a booking

Pseudocode (This procedure takes place over many screens, but the basic algorithm is below):

First Screen (SelectBookingScreen)

When Display

Begin

String Date ← 3 days later

String [] Hours ← Available hours (10:00, 11:00, 12:00, 14:00, 16:00)

If BirthCertificate & CopyID is null

Begin if

Table filled with available times

Booking time added

Type added

end if

else if CopyID is null

begin if

Table filled with available times

Booking time added

Type added

end if

else if ParentID is null

begin if

Table filled with available times

Booking time added

Type added

end if

end else

end else

End

When ContinueButtonActionPerformed

Begin

 If BirthCertificate & CopyID is null

 Begin if

 Add UnabridgedBirthcertificate

 change to ActionPerformedScreen

 end if

 else if CopyID is null

 begin if

 add SmartID

 change to ActionPerformedScreen

 end if

 else if ParentID is null

 begin if

 add Passport

 change to ActionPerformedScreen

 end if

 end else

 end else

End

Explanation:

For the Online Home Affairs to exist and run, booking need to be able to be made and carried out. This function is the main part of the function as without it the program would be useless as you would not be able to book online for Home Affairs which is the main point of it.

Without bookings, full use of this program would not be available, and the program would not be continued. Therefore, it is critical that bookings can be made and added to the database. The above code deals with choosing a booking and ensuring the correct database is selected according to the fields.

Booking a SmartID

Pseudocode:

First Screen (SmartIDScreen)

When ContinueActionPerformed

Begin

 If ID and password corresponds in database

 Begin if

 If checkbox is checked

 Begin if

 Change screen to SmartID3Screen

 End if

 Else

 Begin else

 Change screen to SmartID2Screen

 End else

 End if

 End if

 Else

 Begin else

 Display 'Incorrect details' in red

 End else

End

Second Screen (SmartID2)

When ContinueActionPerformed

Begin

 If File F is not null

 Begin if

 Change to SmartID4 screen

 End if

 Else

 Begin else

 Display 'Please Upload a File' in red

```
        End else
End
```

Third Screen (SmartID3)

When ContinueActionPerformed

```
Begin
    If File F is not null
        Begin if
            Change to SmartID2 screen
        End if
        Else
            Begin else
                Display 'Please Upload a File' in red
            End else
        End
End
```

Fourth Screen (SmartID4)

When ContinueActionPerformed

```
Begin
    If File F is not null
        Begin if
            Change to SmartID5 screen
        End if
        Else
            Begin else
                Display 'Please Upload a File' in red
            End else
        End
End
```

Fifth Screen (SmartID5)

When ContinueActionPerformed

Begin

 If File F is not null

 Begin if

 Change to SelectBooking screen

 End if

 Else

 Begin else

 Display 'Please Upload a File' in red

 End else

End

Explanation:

As an Online Home Affairs, it is very important that the Applicant can choose what he is booking an appointment for and that the applicant can enter the information and data needed for that category. The whole reason for an Online Home Affairs is that it is able to help reduce the traffic and congestion at Home Affairs, by entering your information, all the photos you need and choosing a time to book the Home Affairs office will be able to run much smoother and more effectively. I have used the SmartID booking as the example as it requires the most input, but the Passport and Unabridged Birth Certificate both run in the same manner and just require different photos and pieces of information. This algorithm is vitally important as without it the reason for having an Online Home Affairs would be highly ineffective and most people would rather just go to Home Affairs instead of using the online site. For this reason, this algorithm is an integral and critical part of the Online Home Affairs program.

3 Advanced Techniques

In my PAT, I used some advanced techniques to ensure the applicant has a smooth and successful experience with my program.

Menu Bars

To increase the user-friendliness of my program, I have added menu bars to my programs, as many apps and websites have menu bars and so most users know how to use it. This therefore improves the GUI by cleaning up the screen and getting rid of unnecessary repetition of buttons.

Ghost Text

To increase the user-friendliness of my program, I used ghost text to show the user what is expected as input types, it will show the user the type of text needed, and will remove itself when clicked on so that the user can write their own information. Using this will decrease the number of errors made by the applicants.

Help Button

To create the most user-friendly and effective help screen, I created a website purely purposed on helping applicants with any problems they are busy facing. It is easy for an applicant to use as clicking the button will immediately take them to the website where a live chat is available for online assistance or a PDF is available that explains each screen and how it works.

Using photos

To make Online Home Affairs more effective, I allowed applicants to retrieve photos from their computers storage and stored it in a database to be used on the date of the booking. This would reduce the time spent at Home Affairs, reducing the lines and congestion significantly! I also set it to only use Image files to reduce errors performed by the applicant.

4 Test Plan and Results

When I tested my program, I used three different types of data where user interaction was required to examine the results. I used normal data, extreme data, and abnormal data. Normal data is what the program is expected to deal with. Extreme data is like normal data but is long or large in a way that is more than what the program expects. Abnormal data is data that does not match with the data expected by the program. Below the test data and results are shown:

Login Screen

This screen is used to check the authenticity of the applicant or staff member entering the site. This screen required an ID and a password to get in:

Test Number	Input	Normal	Extreme	Abnormal
1	ID Number	0201125085084	00000000000000	H!
2	Password	Byron123	BBB111123232112212312123 121221321321321221321312	!!*@&^(*!

Edit Details2 Screen

This screen allows you to edit the details of an applicant. I chose this screen as it uses checkboxes to choose which details are being edited:

Test Number	Input	Normal	Extreme	Abnormal
3	Full Name	Byron	Pneumonoultramicroscopicsilicovolcanoconiosis	1991dofjo i12
4	Middle Name	Trevor	Pseudopseudohypoparathyroidism	23094809 fdifoj33
5	Surname	Kraus	Floccinaucinihilipilification	Kcojydsio f0493899
6	Cell Number	0792415004	0000000000	092234f5 43
7	Email	byronkraus@gmail.com	Byronbyronbyronbyronbyron1221121232423432@gmail.com	byron@ @ @gmail .com

PastApplicant's Screen

This screen allows you to choose a booking category and shows the past applicants in that category. I chose this screen as it uses a table to select from:

Test Number	Input	Normal	Extreme	Abnormal
8	Booking Table	SmartID	N/A	None Selected

Table of Results

Test Number	Normal	Extreme	Abnormal
1	Success	Success	Success
2	Success	Success	Success
3	Success	Success	Success
4	Success	Success	Success
5	Success	Success	Success
6	Success	Success	Will replace data with original data as it contains a letter
7	Success	Success	Success
8	Success	N/A	No issue, defensive programming forces applicant to select a choice in the table

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