

# COMP2411 – Database Systems Project



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## **USER MANUAL**

### **Functionality of the Program:**

The aim of the program is to work as an efficient course registration system, by providing different kinds of users with different access to the database.

- A Student can:
  - List all the courses in the system.
  - List all the courses that he/she has registered for.
  - Register for courses in the system.
  - Modify his/her personal information.
- An Administrator can:
  - List all courses and students in the system.
  - Add a new course or student in to the system.
  - Modify the information of a course of a student in the system.
  - Delete a course or a student from the system.
  - Modify the grade of a student for one of his/her registered courses.

### **Design of the Program:**

We handle the code of the system using a modular approach and create several functions for performing the tasks listed above.

- First, the user is asked to input a username.
  - An Administrator can log into the system by entering the username “admin”.
  - A Student can log into the system by entering his/her Student ID.
- The input is then authenticated. If the username is invalid, the user is prompted to enter the username again.
- If the user is a Student, he/she is presented with a menu designed specifically for the access of a Student.
- If the user is an Administrator, he/she is presented with a menu designed specifically for the access of an Administrator.
- The user can perform specific functions and exit the program by following the simple instructions printed on the menu.
- The design of the program allows the student(s) to access specific functions made for them like viewing, registering courses and editing their personal information, and hence there is a restricted access for them.
- The Administrator is provided with a wide range of access and is able to modify student as well as course details.

## Compilation and Execution of the Program

### Tools Required to Compile and Run the Program:

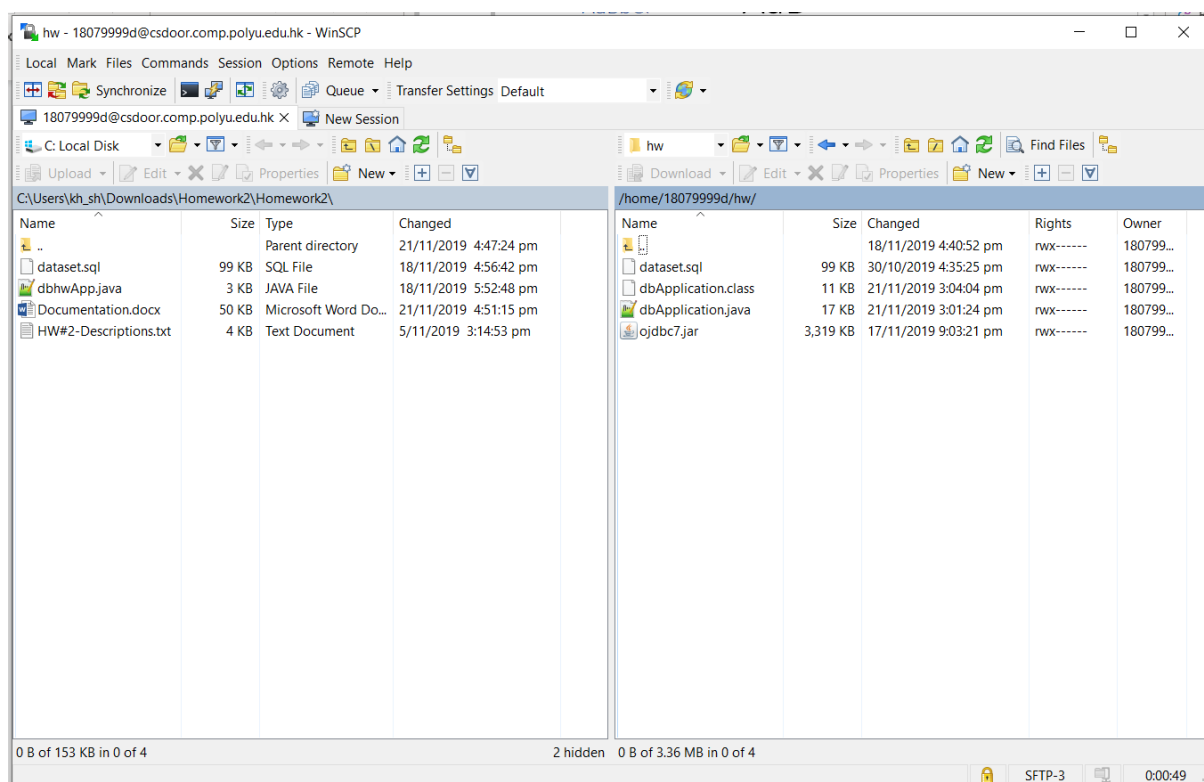
- Java Database Connectivity “ojdbc7.jar” application
- SQL file containing the data to work/test upon
- PuTTY
- WinSCP (not required if operating directly from department server)
- The coded .java file that contains the program code to perform the tasks

### TASK 1: Connecting to Department Server

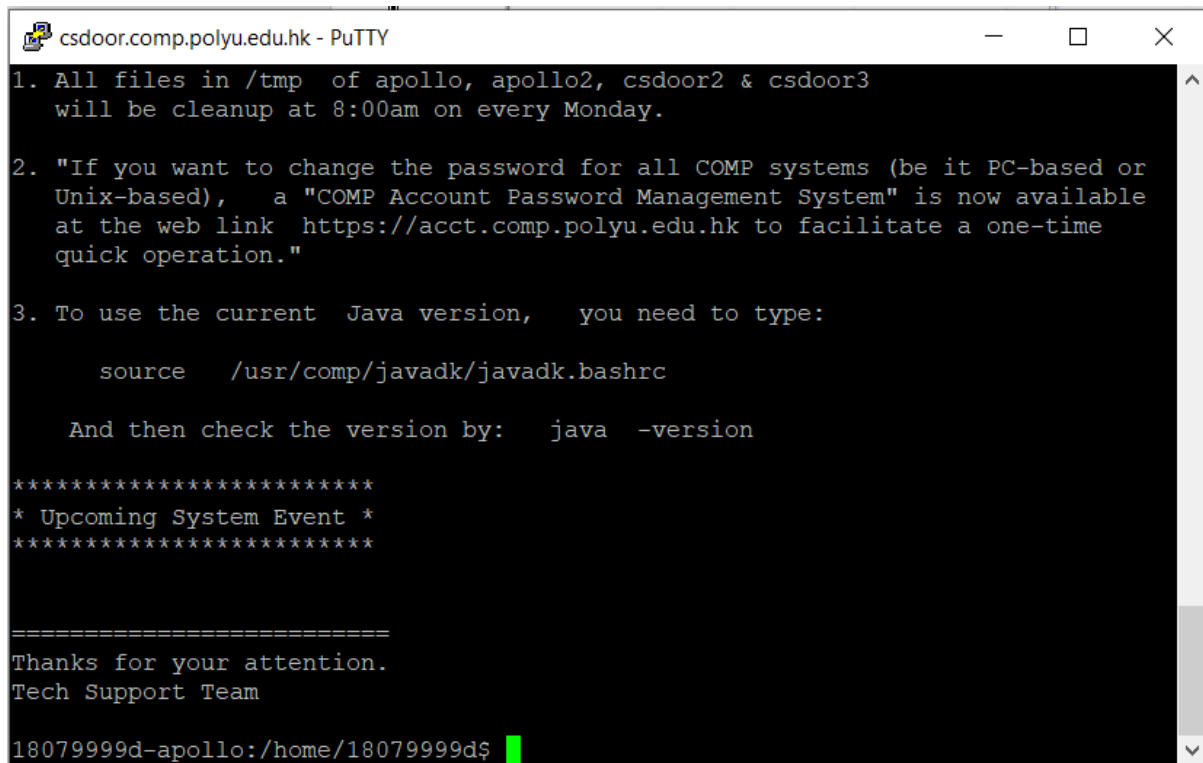
**STEP 1:** Make sure that you have PuTTY and WinSCP installed on your windows system. (Mac users could try terminal instead of PuTTY and FileZilla instead of WinSCP).



**STEP 2:** Using WinSCP to place the required files (ojdbc7.jar, dbApplication.java, dataset.sql) onto the server.



**STEP 3:** Using PuTTY to login to the department server using apollo or appollo2.



A screenshot of a PuTTY terminal window titled "csdoor.comp.polyu.edu.hk - PuTTY". The terminal displays a list of three items: 1. A cleanup notice for files in /tmp on Mondays. 2. Information about a password management system available at a specific URL. 3. Instructions on how to use the current Java version by sourcing a bashrc file and checking the version. Below these items is a separator line, followed by a "Thanks for your attention. Tech Support Team" message. The prompt shows the user is logged in as 18079999d-apollo at the home directory.

```
csdoor.comp.polyu.edu.hk - PuTTY
1. All files in /tmp of apollo, apollo2, csdoor2 & csdoor3
   will be cleanup at 8:00am on every Monday.

2. "If you want to change the password for all COMP systems (be it PC-based or
   Unix-based), a "COMP Account Password Management System" is now available
   at the web link https://acct.comp.polyu.edu.hk to facilitate a one-time
   quick operation."

3. To use the current Java version, you need to type:

   source /usr/comp/javadk/javadk.bashrc

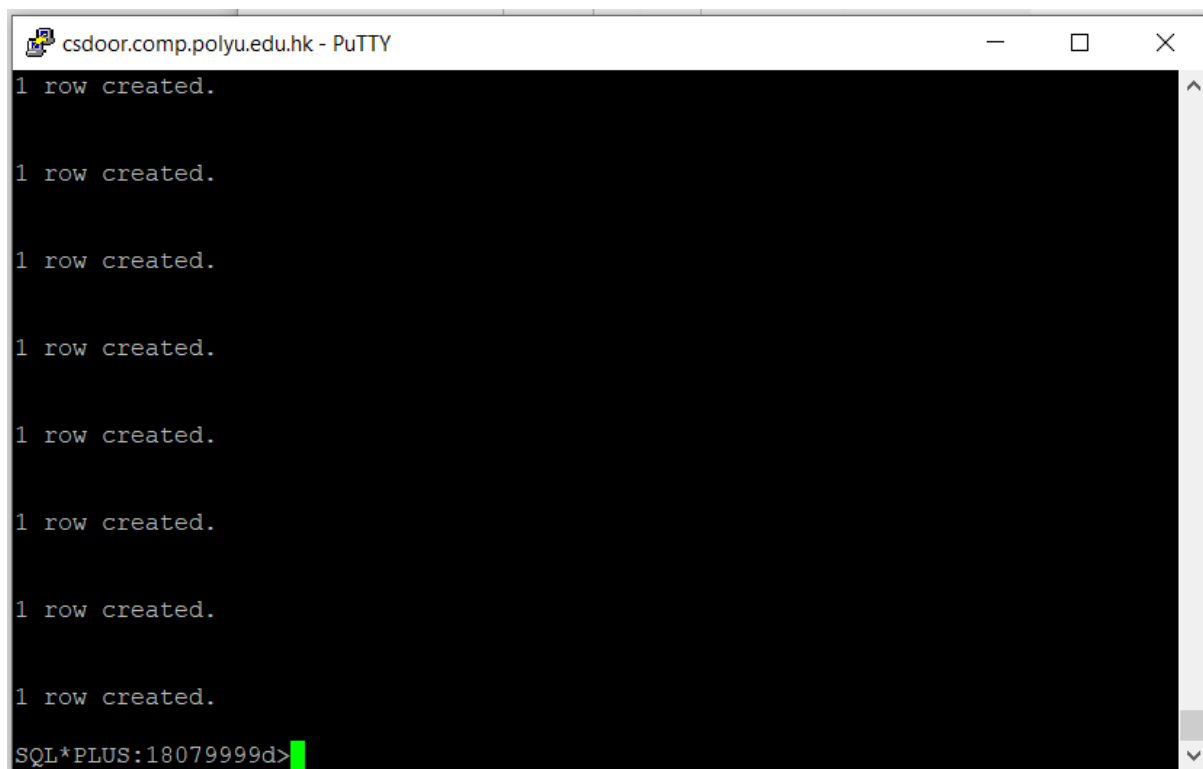
   And then check the version by: java -version

*****
* Upcoming System Event *
*****

=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$
```

**STEP 4:** Using PuTTY to access SQL Database to create tables and insert values with the help of the SQL data file.



A screenshot of a PuTTY terminal window titled "csdoor.comp.polyu.edu.hk - PuTTY". The terminal shows a series of eight "1 row created." messages, indicating successful database insertions. The prompt at the bottom shows the user is now at the SQL\*PLUS prompt.

```
csdoor.comp.polyu.edu.hk - PuTTY
1 row created.

1 row created.

1 row created.

1 row created.

1 row created.

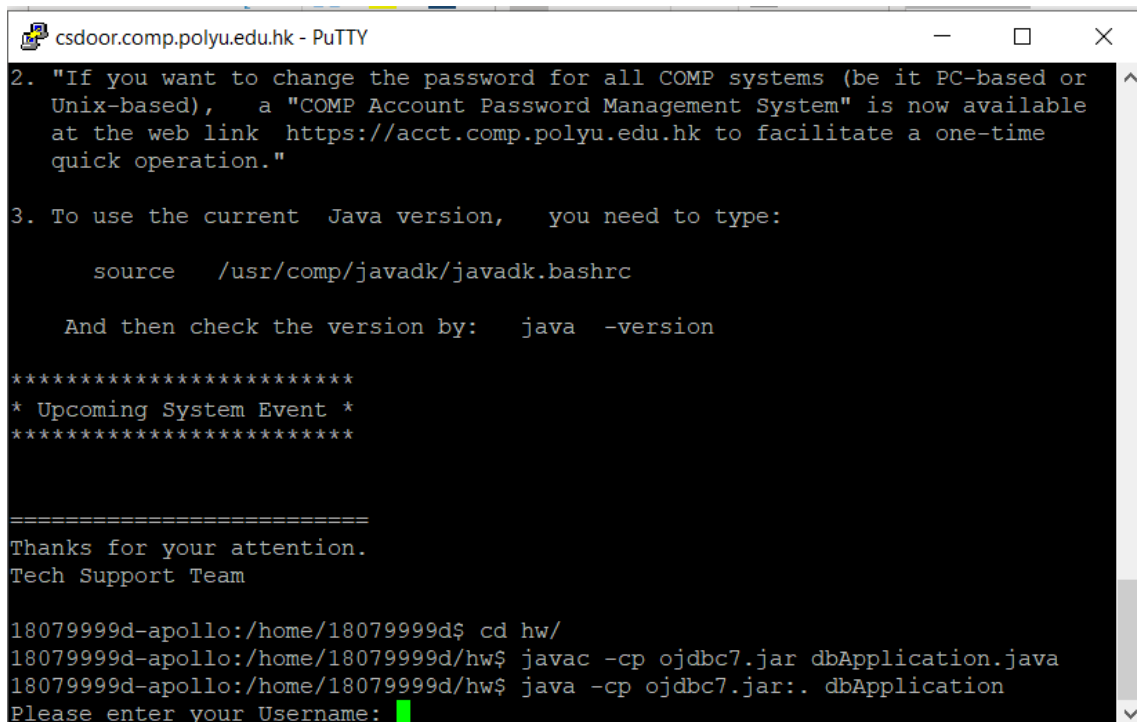
1 row created.

1 row created.

1 row created.

SQL*PLUS:18079999d>
```

**STEP 5:** Use PuTTY again to run the java program using JDBC application.



```
csdoor.comp.polyu.edu.hk - PuTTY
2. "If you want to change the password for all COMP systems (be it PC-based or
   Unix-based), a "COMP Account Password Management System" is now available
   at the web link https://acct.comp.polyu.edu.hk to facilitate a one-time
   quick operation."

3. To use the current Java version, you need to type:

    source /usr/comp/javadk/javadk.bashrc

   And then check the version by: java -version

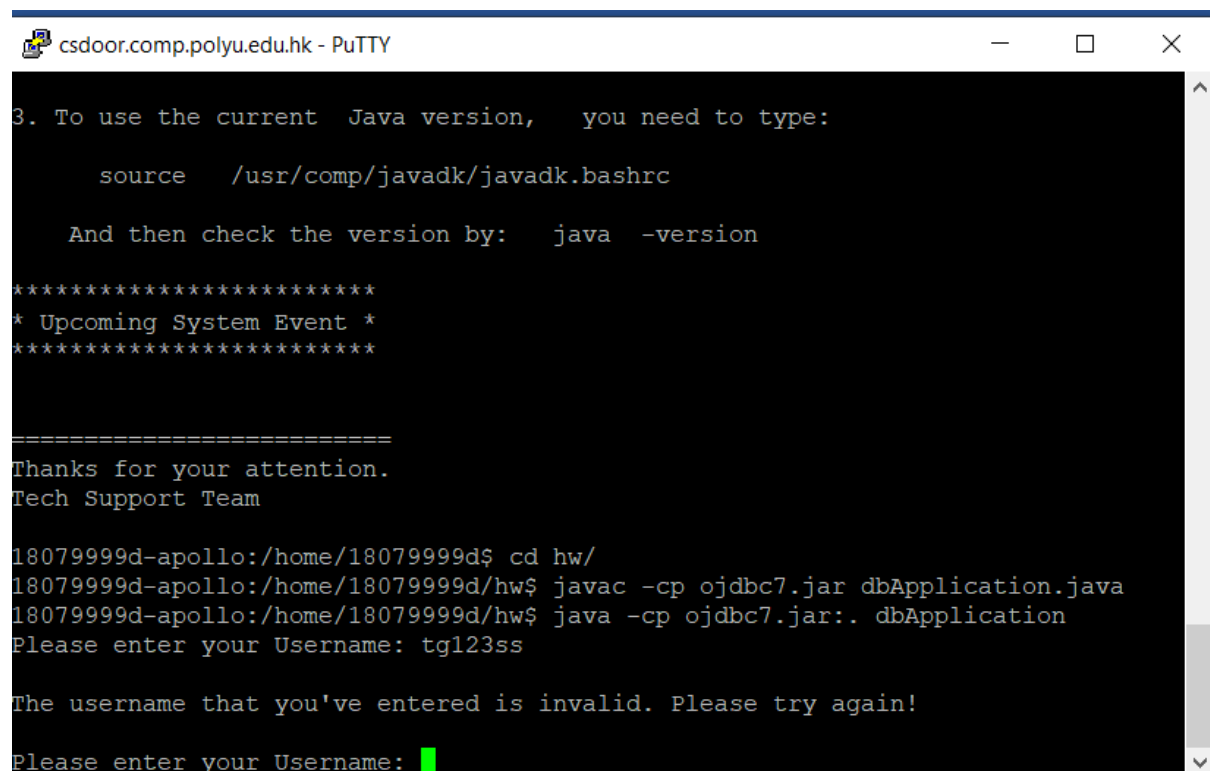
*****
* Upcoming System Event *
*****

=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: █
```

You can see that the program has been compiled now. Now, different logic paths could be tested to ensure whether the program works correctly for all scenarios.

### **Scenario 1 (Invalid Username):**



```
csdoor.comp.polyu.edu.hk - PuTTY
3. To use the current Java version, you need to type:

    source /usr/comp/javadk/javadk.bashrc

   And then check the version by: java -version

*****
* Upcoming System Event *
*****

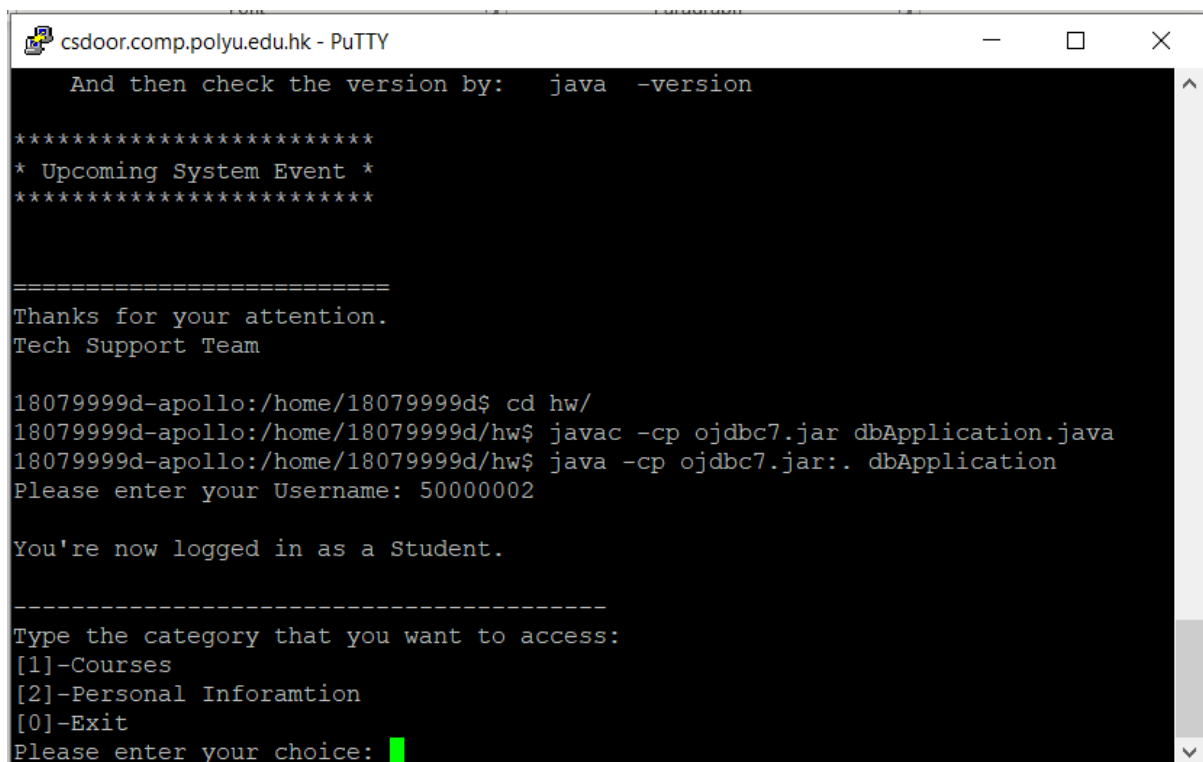
=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: tgl23ss

The username that you've entered is invalid. Please try again!
Please enter your Username: █
```

The user is asked to enter the username again since the entered value is invalid!

## Scenario 2 (The user is a student):



```
csdoor.comp.polyu.edu.hk - PuTTY
And then check the version by:  java -version

*****
* Upcoming System Event *
*****

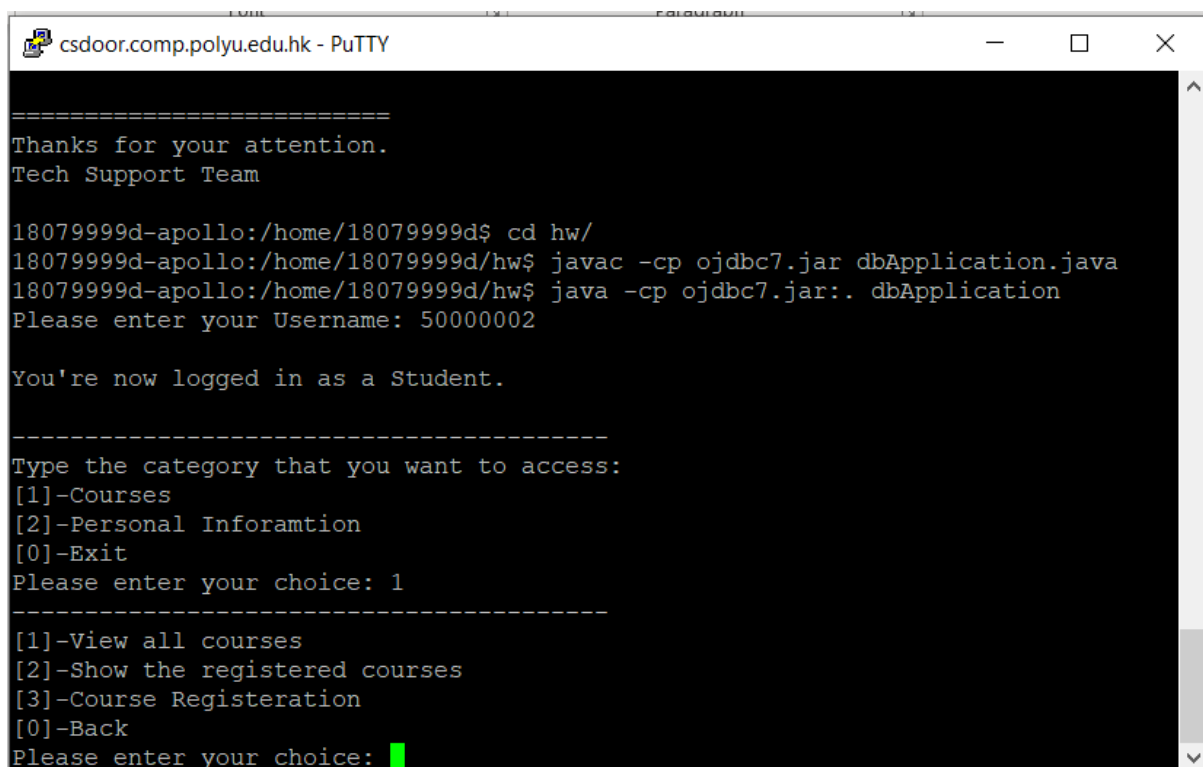
=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: 50000002

You're now logged in as a Student.

-----
Type the category that you want to access:
[1]-Courses
[2]-Personal Information
[0]-Exit
Please enter your choice: █
```

The username entered is of a student. The user is asked the category that he/she wants to access.



```
csdoor.comp.polyu.edu.hk - PuTTY

=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: 50000002

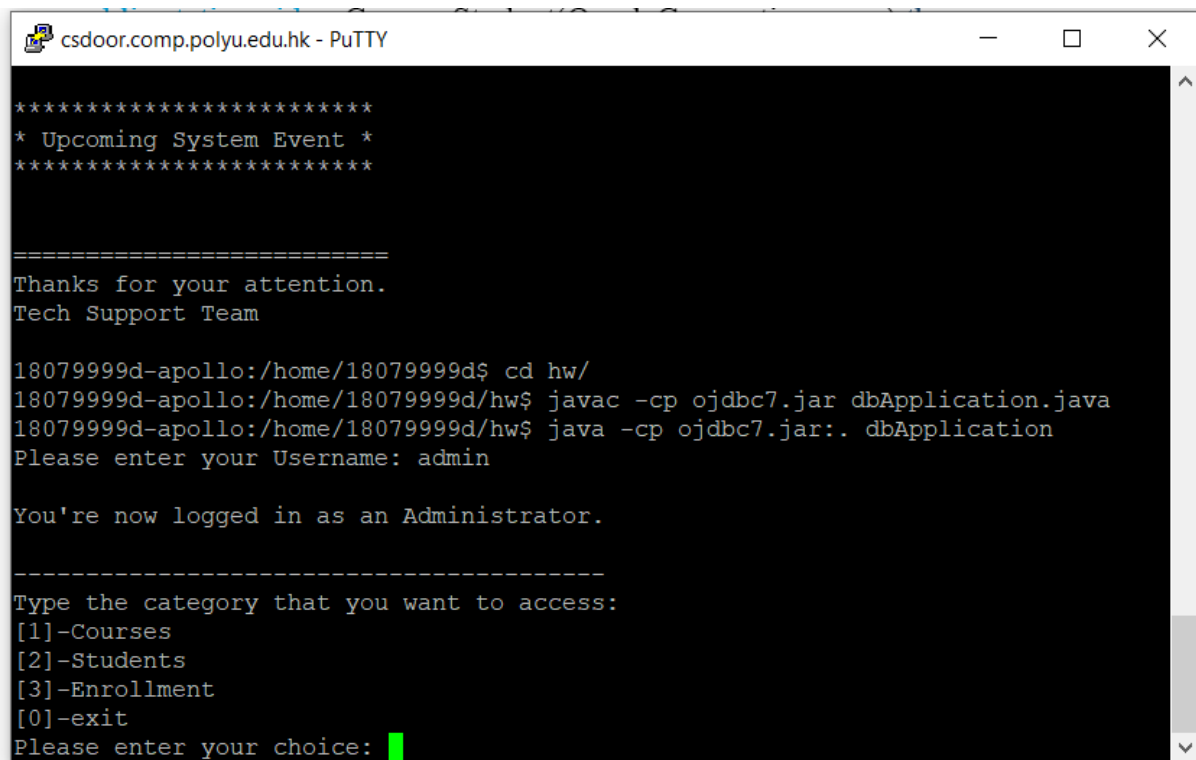
You're now logged in as a Student.

-----
Type the category that you want to access:
[1]-Courses
[2]-Personal Information
[0]-Exit
Please enter your choice: 1

-----
[1]-View all courses
[2]-Show the registered courses
[3]-Course Registration
[0]-Back
Please enter your choice: █
```

The user then selects the task that he/she wants to perform. The user is also provided with an option of going back to previous menu at any time.

## Scenario 2 (The user is an Administrator):



```
csdoor.comp.polyu.edu.hk - PuTTY

*****
* Upcoming System Event *
*****

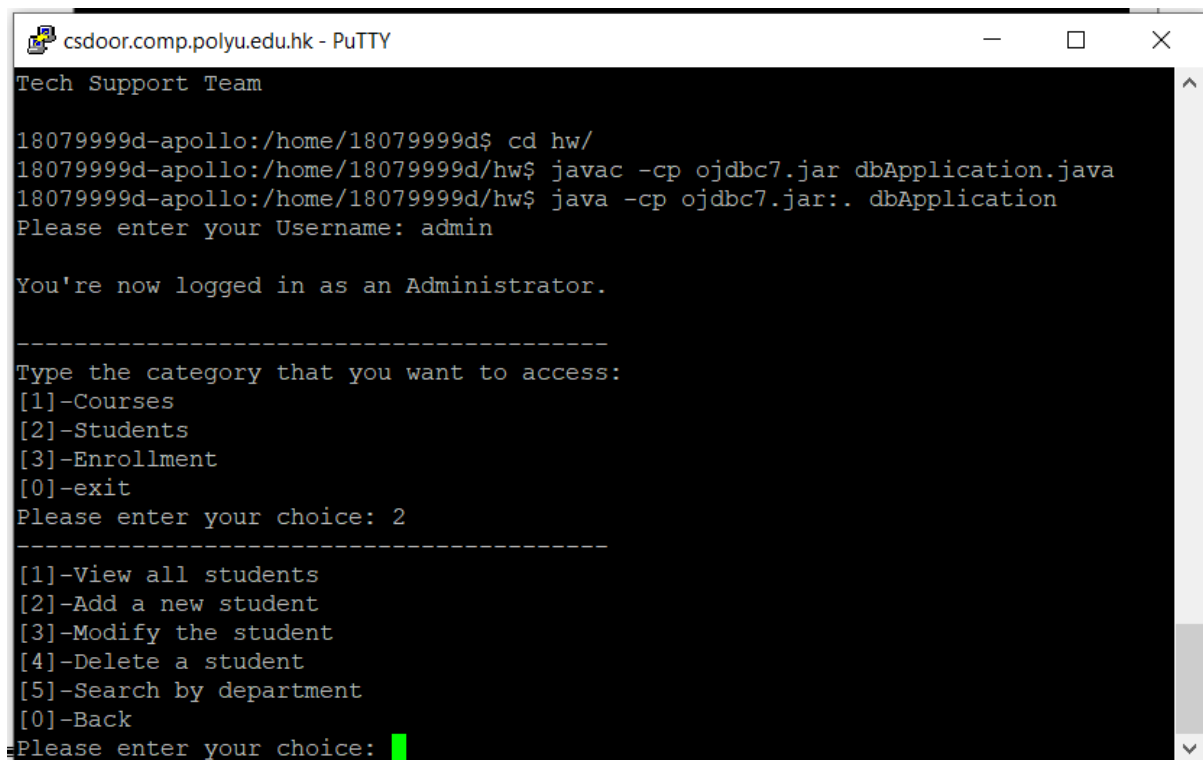
=====
Thanks for your attention.
Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: admin

You're now logged in as an Administrator.

-----
Type the category that you want to access:
[1]-Courses
[2]-Students
[3]-Enrollment
[0]-exit
Please enter your choice: █
```

The username entered is of the Administrator. The Administrator is then asked the category that he/she wants to access.



```
csdoor.comp.polyu.edu.hk - PuTTY

Tech Support Team

18079999d-apollo:/home/18079999d$ cd hw/
18079999d-apollo:/home/18079999d/hw$ javac -cp ojdbc7.jar dbApplication.java
18079999d-apollo:/home/18079999d/hw$ java -cp ojdbc7.jar:. dbApplication
Please enter your Username: admin

You're now logged in as an Administrator.

-----
Type the category that you want to access:
[1]-Courses
[2]-Students
[3]-Enrollment
[0]-exit
Please enter your choice: 2

-----
[1]-View all students
[2]-Add a new student
[3]-Modify the student
[4]-Delete a student
[5]-Search by department
[0]-Back
Please enter your choice: █
```

The Administrator then selects the task that he/she wants to perform. He/she is also provided with an option of going back to previous menu at any time.



## TECHNICAL DOCCUMENTATION

### **Function Signatures and the Tasks Performed by these Functions**

- Main function for the programme. Used to make a connection to the SQL database and call the login and welcome functions.

`public static void main(String args[]) throws SQLException, IOException`

- Function used to authenticate user login details.

`public static void login(OracleConnection conn) throws SQLException, IOException`

- Function used to print specific menu(s) for Student and Administrator & redirecting them to other functions containing more specific menu(s) and perform the tasks opted by the user.

`public static void welcome(OracleConnection conn) throws SQLException, IOException`

- Function (available to Student ONLY) to view all the courses in the system and show the courses registered by the student as per his/her choice.

`public static void opCoursesStudent(OracleConnection conn) throws SQLException, IOException`

- Function (available to Student ONLY) to view and modify his/her personal information as per his/her choice.

`public static void opStudentsStudent(OracleConnection conn) throws SQLException, IOException`

- Function (available to Administrator ONLY) to view, add, delete and modify courses as per his/her choice.

`public static void opCoursesAdmin(OracleConnection conn) throws SQLException, IOException`

- Function (available to Administrator ONLY) to view, add, delete and modify students as per his/her choice.

`public static void opStudentsAdmin(OracleConnection conn) throws SQLException, IOException`

- Function (available to Administrator ONLY) to modify student grade as per his/her choice.

`public static void opEnrollmentAdmin(OracleConnection conn) throws SQLException, IOException`