Car Accessories Company Project

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Main Classes

a) Starter Class (main class)

```
public class Starter extends Application {
    public static DatabaseConnection connector;
    public static UserSessionManager sessionManager;
    public static UserSession userSession;

    @Override
    public void start(Stage stage) throws IOException {
        sessionManager = new UserSessionManager();
        connector = new DatabaseConnection();
        System.out.println(connector.getStatus());


        FXMLLoader fxmlLoader = new FXMLLoader(Starter.class.getResource("/FXMLFiles/login.fxml"));
        Scene scene = new Scene(fxmlLoader.load(), 608, 837);
        stage.setTitle("Car Zone Company");
        stage.setScene(scene);
        stage.setResizable(false);
        stage.show();
    }

    public static void main(String[] args) {
        launch();
    }
}
```

- connector: instance of DatabaseConnection Class.
- sessionManager: instance of UserSessionManager Class.
- userSession: instance of UserSession Class, use it after logging in.

b) UserSession Class

```
public class UserSession extends User{
    private String sessionId;

    public UserSession(User user) {
        super(user);
    }

    public String getSessionId() {
        return sessionId;
    }

    public void setSessionId(String sessionId) {
        this.sessionId = sessionId;
    }

    @Override
    public String toString() {
        return "Classes.UserSession{" + getUsername() + ": " + "sessionId='" + sessionId + '\'' + '}';
    }
}
```

- Extends User Class to use its methods and attributes.
- Contains a user (create it using *super* conctructor)

Database Classes

a) DatabaseConnection Class

- To establish database connection given it databaseName, username, password, root, port.
- status will use for testing, same for all classes.

```java
public class DatabaseConnection {
    private String databaseName, username, password, status;
    private int port;
    private Connection con;

    public DatabaseConnection(){
        setPort(3306);
        setDatabaseName("caraccessoriescompany");
        setUsername("root");
        setPassword("12345678password");
        setCon();
    }
    public DatabaseConnection(int port, String databaseName, String username, String password){
        setPort(port);
        setDatabaseName(databaseName);
        setUsername(username);
        setPassword(password);
        setCon();
    }
    public String getStatus() {return status;}
    public Connection getCon() {return con;}
    public void setDatabaseName(String databaseName) {this.databaseName = databaseName;}
    public void setUsername(String username) {this.username = username;}
    public void setPassword(String password) {this.password = password;}
    public void setPort(int port) {this.port = port;}
    public void setStatus(String status) {this.status = status;}
    public void setCon() {
        String url = "jdbc:mysql://localhost:" + port + "/" + databaseName;
        try{
            Class.forName("com.mysql.cj.jdbc.Driver");
            con= DriverManager.getConnection(url, username, password);
            setStatus("Connected to the database successfully");
        }catch(Exception e){
            System.out.println(e);
            setStatus("Couldn't connect to the database");
        }
    }
}
```

b) RetrievingData Class

- Not ready yet (we will add more entities to it)
- Retrieving records from database giving the condition and entity name to the suitable function.

```java
public class RetrievingData{
    private Connection con;
    private String status;

    public RetrievingData(Connection con){this.con = con;}

    public String getStatus() {return status;}

    public void setStatus(String status) {this.status = status;}

    private ResultSet getFromData(String entity, String condition) throws Exception{
        ResultSet rs = null;
        String query = "SELECT * FROM " + entity + " " + (condition.equals("") ? "":"where " + condition);
        Statement st = con.createStatement();
        rs = st.executeQuery(query);
        return rs;
    }

    public List<User> selectUsers(String condition){
        List<User> users = new ArrayList<>();
        try {
            ResultSet rs = getFromData("users", condition);
            while (rs != null && rs.next())
                users.add(Generator.rsToUser(rs));

            setStatus("Retrieving users successfully");
            return users;
        }catch (Exception e){
            setStatus("Error while retrieving users from database");
            return null;
        }
    }

    public List<Address> selectAddresses(String condition){
        List<Address> addresses = new ArrayList<>();
        try {
            ResultSet rs = getFromData("addresses", condition);
            while (rs != null && rs.next())
                addresses.add(Generator.rsToAddress(rs));

            setStatus("Retrieving addresses successfully");
            return addresses;
        }catch (Exception e){
            setStatus("Error while retrieving addresses from database");
            return null;
        }
    }
}
```

- **connection**: connection to database.
- **getFromData**: from entity and condition, return the resultSet for retrieving records.
- same implementation for all entities, call ***getFromData*** then use generator class to generate the object from rs.

c) InsertingData Class

- Not ready yet (we will add more entities to it)
- Inserting to database giving the object to the function

```java
public class InsertingData {
    private String status;
    private Connection connection;

    public InsertingData(Connection connection){connection = connection;}
    public String getStatus() {return status;}

    public void setStatus(String status) {this.status = status;}

    public boolean insertUser(User user){
        try {
            String query = "insert into users " + " values (?, ?, ?, ?, ?, ?, ?);";
            PreparedStatement preparedStmt = connection.prepareStatement(query);
            preparedStmt = Generator.userToPS(preparedStmt, user);
            preparedStmt.execute();
            setStatus("User was inserted successfully");
            return true;
        } catch (Exception e) {
            setStatus("Couldn't insert user");
            return false;
        }
    }
}
```

- same implementation for all entities, use generator class to generate the Prepared Statement from object.

Helper Classes

a) Generator Class

- Not ready yet

```
public class Generator {
    public static User rsToUser(ResultSet rs) throws SQLException {
        User tmpUser = new User();
        tmpUser.setFirstName(rs.getString("firstName"));
        tmpUser.setLastName(rs.getString("lastName"));
        tmpUser.setUsername(rs.getString("username"));
        tmpUser.setPhoneNumber(rs.getString("phone"));
        tmpUser.setEmail(rs.getString("email"));
        tmpUser.setPassword(rs.getString("userPassword"));
        tmpUser.setImagePath(rs.getString("image"));
        return tmpUser;
    }

    public static Address rsToAddress(ResultSet rs) throws SQLException {
        Address tmpAddress = new Address();
        tmpAddress.setCountry(rs.getString("country"));
        tmpAddress.setCity(rs.getString("city"));
        tmpAddress.setStreet(rs.getString("street"));
        return tmpAddress;
    }
    public static PreparedStatement userToPS(PreparedStatement preparedStmt, User user) throws SQLException {
        preparedStmt.setString(1, user.getFirstName());
        preparedStmt.setString(2, user.getLastName());
        preparedStmt.setString(3, user.getUsername());
        preparedStmt.setString(4, user.getPhoneNumber());
        preparedStmt.setString(5, user.getEmail());
        preparedStmt.setString(6, user.getPassword());
        preparedStmt.setString(7, "");
        return preparedStmt;
    }
}
```

b) DataValidation Class

```java
public class DataValidation {

    public static boolean regexMatcher(String regex, String value){
        Pattern pattern = Pattern.compile(regex);
        Matcher matcher = pattern.matcher(value);
        return matcher.matches();
    }

    public static String userValidationTest(User user){
        if(user.getEmail().equals("")) return "Email address can't be empty";
        if(user.getPhoneNumber().equals("")) return "Phone number can't be empty";
        if(user.getPassword().equals("")) return "Password can't be empty";
        if(user.getUsername().equals("")) return "Username can't be empty";
        if(user.getFirstName().equals("")) return "First name can't be empty";
        if(user.getLastName().equals("")) return "Last name can't be empty";
        if(emailValidationTest(user.getEmail())){
            if(phoneNumberValidationTest(user.getPhoneNumber())) {
                if (passwordValidationTest(user.getPassword())) return "Valid";
                return "Invalid password";
            }
            return "Invalid phone number";
        }
        return "Invalid email address";
    }

    public static boolean phoneNumberValidationTest(String phoneNumber) {
        String regex = "^[0-9]{10}$";
        return regexMatcher(regex, phoneNumber);
    }

    public static  boolean emailValidationTest(String email) {
        String regex = "^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\\.[a-zA-Z]{2,}$";
        return regexMatcher(regex, email);
    }

    public static boolean passwordValidationTest(String password) {
        String regex = "^(?=.*[a-z])(?=.*[A-Z])(?=.*\\d)(?=.*[@$!%*?&])[A-Za-z\\d@$!%*?&]{8,}$";
        return regexMatcher(regex, password);

    }
```

Model Classes

a) User Class

```
public class User {
    private String username, firstName, lastName, phoneNumber, password, email, imagePath;
    private Address address;

    public User(){
        this.username    = ""; this.firstName   = ""; this.lastName    = ""; this.phoneNumber = "";
        this.password    = ""; this.email       = ""; this.imagePath   = ""; this.address     = null;
    }
    public User(String username, String firstName, String lastName, String phoneNumber,
               String password, String email, String imagePath, Address address) {
        setUsername(username); setFirstName(firstName);
        setLastName(lastName); setPhoneNumber(phoneNumber);
        setPassword(password); setEmail(email);
        setImagePath(imagePath); setAddress(address);
    }
    public User(User user){
        this(user.getUsername(), user.getFirstName(), user.getLastName(),
                user.getPhoneNumber(), user.getPassword(), user.getEmail(),
                user.getImagePath(), user.getAddress());
    }

    public String getUsername() {return username;}

    public void setUsername(String username) {this.username = username.toLowerCase();}

    public String getFirstName() {return firstName;}

    public void setFirstName(String firstName) {this.firstName = firstName;}

    public String getLastName() {return lastName;}

    public void setLastName(String lastName) {this.lastName = lastName;}

    public String getPhoneNumber() {return phoneNumber;}

    public void setPhoneNumber(String phoneNumber) {this.phoneNumber = phoneNumber;}

    public String getPassword() {return password;}

    public void setPassword(String password) {this.password = password;}

    public String getEmail() {return email;}

    public void setEmail(String email) {this.email = email;}

    public String getImagePath() {return imagePath;}

    public void setImagePath(String imagePath) {this.imagePath = imagePath;}

    public Address getAddress() {return address;}

    public void setAddress(Address address) {this.address = address;}

    @Override
    public String toString() {
        return "User{" + "username='" + username + '\'' + ", firstName='" + firstName + '\''
                + ", lastName='" + lastName + '\'' + ", phoneNumber='" + phoneNumber + '\''
                + ", password='" + password + '\'' + ", email='" + email + '\''
                + ", imagePath='" + imagePath + '\'' + ", address=" + address + '}';
    }
}
```

b) Address Class

```java
public class Address {
    private String country, city, street;

    public String getCountry() {
        return country;
    }

    public void setCountry(String country) {
        this.country = country;
    }

    public String getCity() {
        return city;
    }

    public void setCity(String city) {
        this.city = city;
    }

    public String getStreet() {
        return street;
    }

    public void setStreet(String street) {
        this.street = street;
    }

    @Override
    public String toString() {
        return "Address{" +
                "country='" + country + '\'' +
                ", city='" + city + '\'' +
                ", street='" + street + '\'' +
                '}';
    }
}
```

Authentication Classes

a) UserSessionManager

```
public class UserSessionManager {
    private static Map<String, String> userSessions = new HashMap<>();

    // Method to create a session for a user upon successful login
    public static String createSession(String username) {
        String sessionId = generateSessionId();
        userSessions.put(sessionId, username);
        System.out.println("Session created for user: " + username + ", Session ID: " + sessionId);
        return sessionId;
    }

    // Method to check if a session exists for a given session ID
    public static boolean isValidSession(String sessionId) {
        return userSessions.containsKey(sessionId);
    }

    // Method to retrieve username from a session ID
    public static String getUsernameFromSession(String sessionId) {
        return userSessions.get(sessionId);
    }

    // Simulated session ID generation method
    private static String generateSessionId() {
        String tmpID;
        do{
            tmpID = "SESSION_" + System.currentTimeMillis();
        }while (isValidSession(tmpID));
        return  tmpID; // Not a secure way, just for demonstration
    }

    // Method to invalidate a session (logout)
    public static void invalidateSession(String sessionId) {
        userSessions.remove(sessionId);
        System.out.println("Session invalidated for Session ID: " + sessionId);
    }

    // For demonstration: displaying all active sessions
    public static void displayActiveSessions() {
        System.out.println("Active Sessions:");
        for (Map.Entry<String, String> entry : userSessions.entrySet()) {
            System.out.println("Session ID: " + entry.getKey() + ", Username: " + entry.getValue());
        }
    }

}
```

- To generate a session when logging in, or delete it when signing out.

b) Login Class

```
public class Login {
    private String status;
    private RetrievingData usersRetriever;
    public Login(Connection connection) {
        usersRetriever = new RetrievingData(connection);
    }

    public String getStatus() {
        return status;
    }

    public void setStatus(String status) {
        this.status = status;
    }

    public boolean loginUser(String username, String password){
        username = username.toLowerCase();

        List<User> allUsers = usersRetriever.selectUsers("username = '" + username + "'");
        if(allUsers != null && allUsers.size() != 0 ) {
            User tmpUser = allUsers.get(0);
            if (tmpUser.getPassword().equals(password)) {
                setStatus("Valid username and password");
                Starter.userSession = new UserSession(tmpUser);
                Starter.userSession.setSessionId(Starter.sessionManager.createSession(username));
                return true;
            }
        }
        setStatus("Invalid username or password");
        return false;
    }


}
```

- **loginUser**: the main method in this class, it's used to check if the username is existed using ***usersRetriever*** (an instance of RetrievingData Class), if yes, check the password, if it's correct, then create a session using UserSession and UserSessionManager classes.

c) Register Class

```java
public class Register {
    private String status;
    private InsertingData userInserter;
    private RetrievingData userRetriever;

    public Register(Connection connection){
        userInserter = new InsertingData(connection);
        userRetriever = new RetrievingData(connection);
    }
    public String getStatus() {return status;}

    public void setStatus(String status) {this.status = status;}

    public void registerUserTest(User user){
        String st = DataValidation.userValidationTest(user);
        if(st.equals("Valid")){
            List<User> allUsers = userRetriever.selectUsers("username = '" + user.getUsername() + "'");
            if(allUsers == null || allUsers.size() == 0 )
                    setStatus("User was registered successfully");
            else
                setStatus("Username is already taken");
        }
        else
            setStatus(st);
    }
    public boolean registerUser(User user){
        registerUserTest(user);
        if(getStatus().equals("User was registered successfully")){
            if(userInserter.insertUser(user)) {
                setStatus("User was registered successfully");
                return true;
            }
            setStatus("Couldn't register user");

        }
        return false;
    }
}
```

- **registerUserTest**: it's used to check if user's fields are valid using DataValidation Class, if yes, check if the user is already exist using RetrievingData Class, if not, we can register it successfully.

- **registerUser**: the main method in this class, it uses ***registerUserTest*** to check the availability to register the user then use an instance of InsertingData Class to add the user to the database.

Task1

- Features (1, 2) for Database
- Features (3, 4) for Authentication

Tester Classes

a) DatabaseTester

```
@RunWith(Cucumber.class)
@CucumberOptions(features = "src/test/resources/databaseFeatures",
        monochrome = true,snippets = CucumberOptions.SnippetType.CAMELCASE,
          glue = {"database"})
public class DatabaseTester {

}
```

b) AuthenticationTester

```
@RunWith(Cucumber.class)
@CucumberOptions(features = "src/test/resources/authenticationFeatures",
        monochrome = true,snippets = CucumberOptions.SnippetType.CAMELCASE,
          glue = {"authentication"})
public class AuthenticationTester {

}
```

Feature 1: Database Connection

- Test the connection of the database given (port, database name, username, password).

Scenarios

```
Feature: Connecting to a given database

  Scenario: Successful connection
    When I want to connect to database
    And I fill in 'port' with '3306'
    And I fill in 'databaseName' with 'caraccessoriescompany'
    And I fill in 'username' with 'root'
    And I fill in 'password' with '12345678password'
    Then I should see "Connected to the database successfully" for connection


  Scenario: Failure connection
    When I want to connect to database
    And I fill in 'port' with '3300'
    And I fill in 'databaseName' with 'invalidName'
    And I fill in 'username' with 'invalidRoot'
    And I fill in 'password' with 'invalidPassword'
    Then I should see "Couldn't connect to the database" for connection
```

Steps definition Class

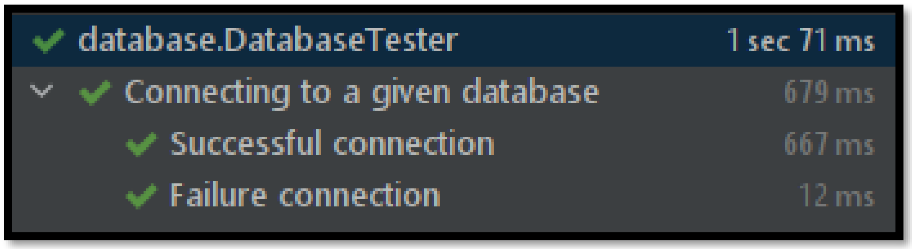
```
public class DBConnectionTest {

    private String databaseName, username, password;
    private int port;
    private DatabaseConnection testConnection;

    @When("I want to connect to database")
    public void iWantToConnectToDatabase() {
        assert(true);
    }
```

- **databaseName, username, password, port**: are used as parameters to set the connection
- **testConnection**: instance of DatabaseConnection Class (using ***getStatus*** as a result to database connection in step definition class)

```
    @When("I fill in {string} with {string}")
    public void iFillInWith(String field, String input) {
        if(field.equals("databaseName"))
            databaseName = input;
        else if (field.equals("username"))
                username = input;
        else if (field.equals("password"))
                password = input;
        else if (field.equals("port"))
            port = Integer.parseInt(input);
        else assert(false);
        assert(true);
    }

    @Then("I should see {string} for connection")
    public void iShouldSee(String message) {
        testConnection = new DatabaseConnection(port, databaseName, username, password);
        String status = testConnection.getStatus();
        assertEquals(status, message);
    }
}
```

- **iFillInWith**: set the value of each field necessary to establish the connection, assert false if invalid field is entered.
- **iShouldSee**: compare the expected result with the status of ***testConnection***.

Result



```
✓ database.DatabaseTester                1 sec 71 ms
  ✓ Connecting to a given database           679 ms
      ✓ Successful connection                667 ms
      ✓ Failure connection                    12 ms
```

Feature 2: Retrieving from DB

Scenarios

```
Feature: Retrieve data from database

  Scenario Outline: I retrieve from users entity
    Given I'm connected to a database
    When I fill in condition with "<condition>"
    And I want to retrieve 'users'
    Then I should see "<message>" for retrieving data
    And close the connection
  Examples:
    | condition                                         | message                                        |
    |                                                   | Retrieving users successfully                  |
    | username = 'rihamkatout'                          | Retrieving users successfully                  |
    | username = rihamkatout                            | Error while retrieving users from database     |
    | username = 'nousername'                           | Retrieving users successfully                  |
    | phone = '0599119482'                              | Retrieving users successfully                  |
    | email = 'rihamk@gm.c'                             | Retrieving users successfully                  |
    | firstName = 'Riham'                               | Retrieving users successfully                  |
    | lastName = 'Katout'                               | Retrieving users successfully                  |
    | username = 'rihamkatout' AND firstName = 'Riham'  | Retrieving users successfully                  |
    | latName = 'Katout'                                | Error while retrieving users from database     |
    | lastName = 'Katout' ANDD firstName = 'Riham'      | Error while retrieving users from database     |


  Scenario Outline: I retrieve from addresses entity
    Given I'm connected to a database
    When I fill in condition with "<condition>"
    And I want to retrieve 'addresses'
    Then I should see "<message>" for retrieving data
    And close the connection
  Examples:
    | condition                                         | message                                        |
    |                                                   | Retrieving addresses successfully              |
    | city = 'Nablus'                                   | Retrieving addresses successfully              |
    | country = 'Palestine'                             | Retrieving addresses successfully              |
    | country = 'FakeCountry'                           | Retrieving addresses successfully              |
    | street = 'Sikkah street'                          | Retrieving addresses successfully              |
    | country = 'Palestine' AND city = 'Nablus'         | Retrieving addresses successfully              |
    | country = 'Palestine' ANDDDD city = 'Nablus'      | Error while retrieving addresses from database |
```

* We will use the same feature to test retrieving other entities in the future*

Steps definition Class

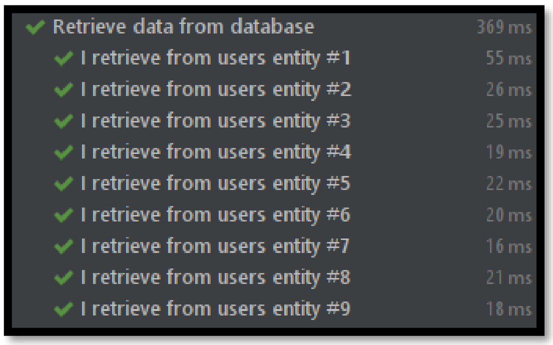
```
public class DBRetrievingTest {
    private String condition, status;
    private DatabaseConnection connection;
    private RetrievingData retrievingData;

    @BeforeAll
    @Given("I'm connected to a database")
    public void iMConnectedToADatabase() {
       connection = new DatabaseConnection();
       retrievingData = new RetrievingData(connection.getCon());
    }
```

- **connection**: temporary connection to database
- **retrievingData**: instance of RetrievingData Class.
- **condition**: to store the condition when user enters it.
- **status**: to store the result of retrieving then use it in ***iShouldSee*** step

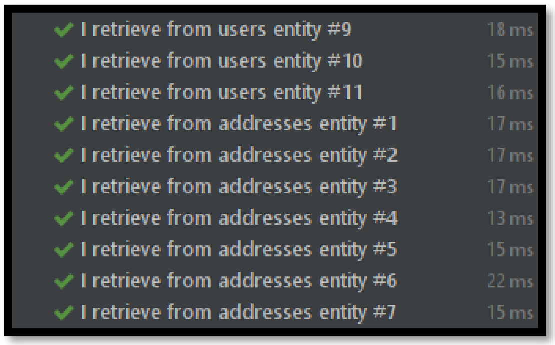
```
    @When("I fill in condition with {string}")
    public void iFillInConditionWith(String string) {
        condition = string;
    }
    @When("I want to retrieve {string}")
    public void iWantToRetrieve(String entity) {
        if(entity.equals("users")) {
            retrievingData.selectUsers(condition);
            status = retrievingData.getStatus();
        }
        else if(entity.equals("addresses")){
            retrievingData.selectAddresses(condition);
            status = retrievingData.getStatus();
        }
        else
            status = "Error while retrieving from database";
    }
    @Then("I should see {string} for retrieving data")
    public void iShouldSee(String message) {
        assertEquals(status, message);
    }
    @AfterAll
    @Then("close the connection")
    public void closeTheConnection() throws SQLException {
        connection.getCon().close();
    }
}
```

- **iWantToRetrieve**: call the suitable function according to entered entity, then store the result in status.
- **iShouldSee**: compare the result with the expected value, if they are equal assert true, otherwise, false.
- **closeTheConnection**: close the connection after finishing all steps.

Result



```
✓ Retrieve data from database            369 ms
   ✓ I retrieve from users entity #1      55 ms
   ✓ I retrieve from users entity #2      26 ms
   ✓ I retrieve from users entity #3      25 ms
   ✓ I retrieve from users entity #4      19 ms
   ✓ I retrieve from users entity #5      22 ms
   ✓ I retrieve from users entity #6      20 ms
   ✓ I retrieve from users entity #7      16 ms
   ✓ I retrieve from users entity #8      21 ms
   ✓ I retrieve from users entity #9      18 ms
```



```
   ✓ I retrieve from users entity #9          18 ms
   ✓ I retrieve from users entity #10         15 ms
   ✓ I retrieve from users entity #11         16 ms
   ✓ I retrieve from addresses entity #1      17 ms
   ✓ I retrieve from addresses entity #2      17 ms
   ✓ I retrieve from addresses entity #3      17 ms
   ✓ I retrieve from addresses entity #4      13 ms
   ✓ I retrieve from addresses entity #5      15 ms
   ✓ I retrieve from addresses entity #6      22 ms
   ✓ I retrieve from addresses entity #7      15 ms
```

Feature 3: Login

Scenarios

```
Feature: Login feature
  I want to login to car accessories

  Scenario Outline: login scenarios
    Given user is connected to the database
    When he fills in 'username' with '<username>' for login
    And he fills in 'password' with '<password>' for login
    And user clicks on login
    Then user should see '<message>' for login
    And close the connection

    Examples:
      | username      | password    | message                     |
      | rihamkatout   | 1234**Aa    | Valid username and password  |
      | rihamkatout2  | 1234**Aa    | Valid username and password  |
      | rihamkatout3  | 1234**Aa    | Valid username and password  |
      | rihamkatout9  | 123456      | Invalid username or password |
      | rihamkatout   | 12de456     | Invalid username or password |
      |               | 12de456     | Invalid username or password |
      | rihamkatout   |             | Invalid username or password |
```

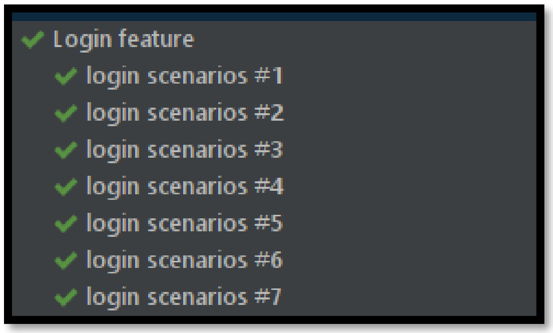
Steps definition Class

```
public class LoginTester {

    private String status, username, password;
    private DatabaseConnection connection;
    private Login login;


    @BeforeAll
    @Given("user is connected to the database")
    public void userIsConnectedToTheDatabase() {
        connection = new DatabaseConnection();
        login = new Login(connection.getCon());
    }
```

- **connection**: temporary connection to database.
- **status**: to store the result of retrieving then use it in ***userShouldSee*** step.
- **username, password**: to store input from user.
- **login**: instance of Login Class to test logging in.

```
    @When("he fills in {string} with {string} for login")
    public void heFillsInWith(String field, String input) {
        if(field.equals("username"))
            username = input;
        else
            password = input;
    }

    @When("user clicks on login")
    public void userClicksOnLogin() {
        login.loginUser(username, password);
        status = login.getStatus();
    }

    @Then("user should see {string} for login")
    public void userShouldSee(String message) {
        assertEquals(status,message);
    }

    @AfterAll
    @Then("close the connection")
    public void closeTheConnection() throws SQLException {
        connection.getCon().close();
    }
}
```

Result



```
✓ Login feature
    ✓ login scenarios #1
    ✓ login scenarios #2
    ✓ login scenarios #3
    ✓ login scenarios #4
    ✓ login scenarios #5
    ✓ login scenarios #6
    ✓ login scenarios #7
```

Feature 4: Register

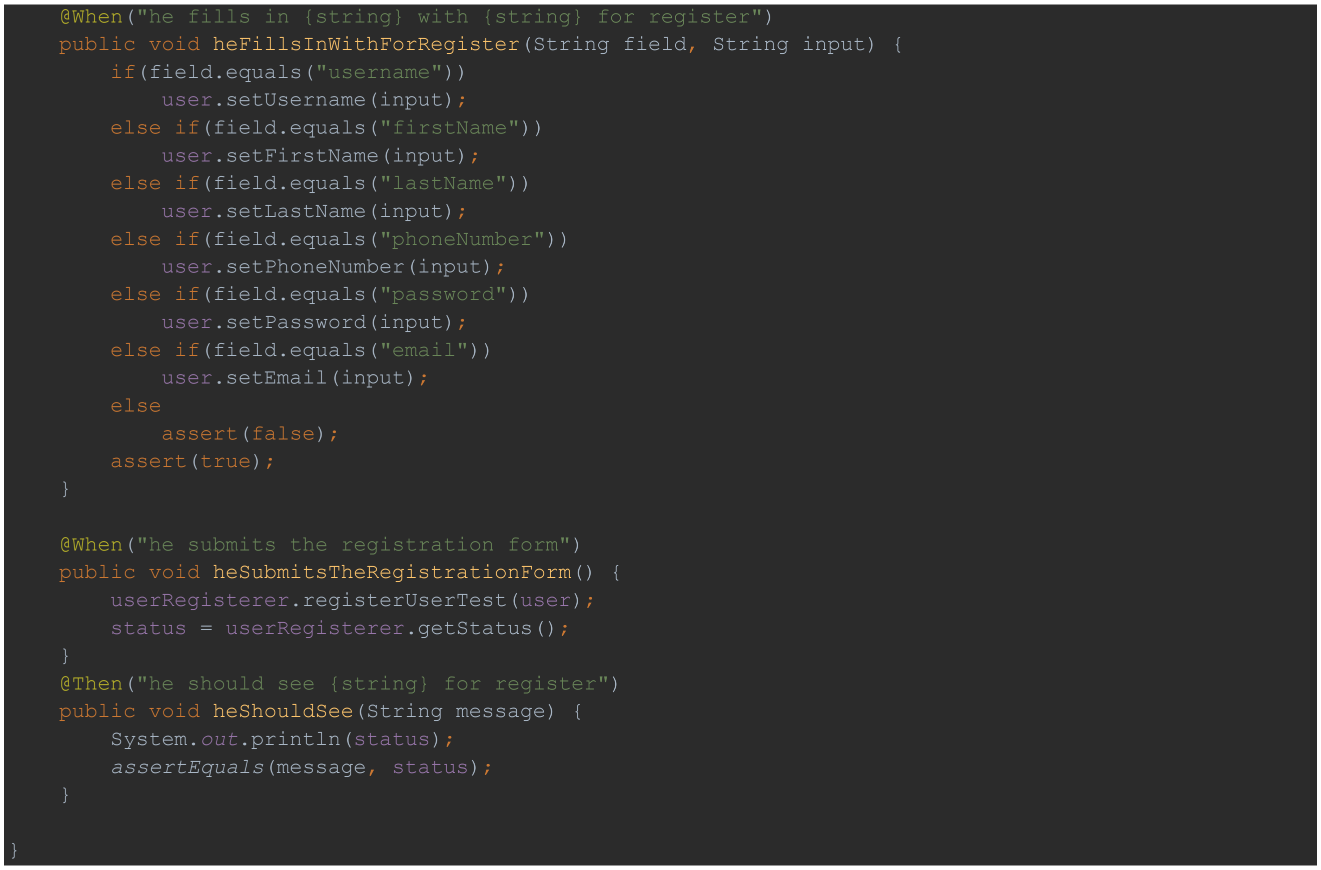
Scenarios

```
Feature: User sign-Up
  I want to sign up for car accessories

  Scenario Outline: User sign-up with various inputs
    When user is in sign-up page
    And he fills in 'username' with "<Username>" for register
    And he fills in 'firstName' with "<FirstName>" for register
    And he fills in 'lastName' with "<LastName>" for register
    And he fills in 'phoneNumber' with "<PhoneNumber>" for register
    And he fills in 'password' with "<Password>" for register
    And he fills in 'email' with "<Email>" for register
    And he submits the registration form
    Then he should see "<Message>" for register

    Examples:
      | Username| FirstName| LastName| PhoneNumber| Password    | Email             | Message                        |
      | shahd28 | Shahd    | Hamad   | 0595014020 | 1234**Aa    | shahd22@gmail.com| User was registered successfully |
      | shahd18 | Shahd    | Hamad   | 059501402  | 1234**Aa    | shahd18@gmail.com| Invalid phone number            |
      | shahd12 | Shahd    | Hamad   | 059501402a | 1234**Aa    | shahd12@gmail.com| Invalid phone number            |
      | shahd28 | Shahd    | Hamad   | 0595014020 | weakPassword| shahd28@gmail.com| Invalid password                |
      | shahd20 | Shahd    | Hamad   | 0595014020 | 1234**Aa    | shahd22ail.com   | Invalid email address           |
      | shahd11 | Shahd    | Hamad   | 0595014020 | 1234**Aa    | shahd11@gmail.com| Username is already taken       |
      |         | Shahd    | Hamad   | 0595014020 | 1234**Aa    | shahd29@gmail.com| Username can't be empty         |
      | shahd19 |          | Hamad   | 0595014020 | 1234**Aa    | shahd29@gmail.com| First name can't be empty       |
      | shahd19 | Shahd    |         | 0595014020 | 1234**Aa    | shahd29@gmail.com| Last name can't be empty        |
      | shahd19 | Shahd    | Hamad   |            | 1234**Aa    | shahd29@gmail.com| Phone number can't be empty     |
      | shahd19 | Shahd    | Hamad   | 0595014020 |             | shahd29@gmail.com| Password can't be empty         |
      | shahd19 | Shahd    | Hamad   | 0595014020 | 1234**Aa    |                  | Email address can't be empty    |
```

Steps definition Class

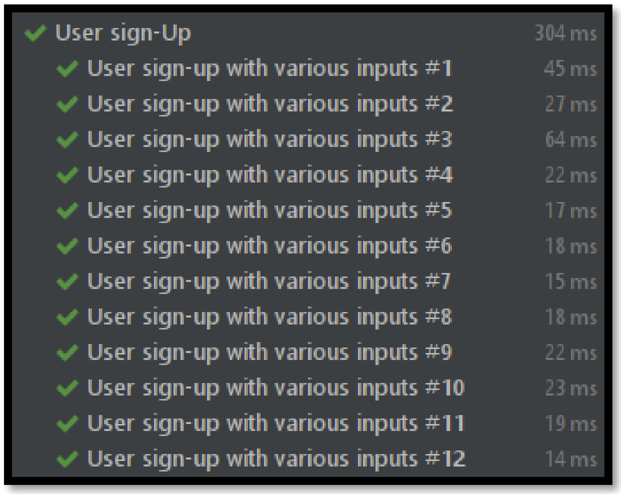
```
public class SignupTester {
    private Register userRegisterer;
    private User user;
    private DatabaseConnection connection;
    private String status;

    @BeforeAll
    @When("user is in sign-up page")
    public void userIsOnTheSignUpPage() {
        connection = new DatabaseConnection();
        userRegisterer = new Register(connection.getCon());
        user = new User();
    }
```

- **connection**: temporary connection to database.
- **status**: to store the result of retrieving then use it in ***heShouldSee*** step.
- **user**: to store input from user.
- **userRegisterer**: instance of Register Class.



```java
    @When("he fills in {string} with {string} for register")
    public void heFillsInWithForRegister(String field, String input) {
        if(field.equals("username"))
            user.setUsername(input);
        else if(field.equals("firstName"))
            user.setFirstName(input);
        else if(field.equals("lastName"))
            user.setLastName(input);
        else if(field.equals("phoneNumber"))
            user.setPhoneNumber(input);
        else if(field.equals("password"))
            user.setPassword(input);
        else if(field.equals("email"))
            user.setEmail(input);
        else
            assert(false);
        assert(true);
    }

    @When("he submits the registration form")
    public void heSubmitsTheRegistrationForm() {
        userRegisterer.registerUserTest(user);
        status = userRegisterer.getStatus();
    }
    @Then("he should see {string} for register")
    public void heShouldSee(String message) {
        System.out.println(status);
        assertEquals(message, status);
    }

}
```

Result



```
✓ User sign-Up                            304 ms
   ✓ User sign-up with various inputs #1   45 ms
   ✓ User sign-up with various inputs #2   27 ms
   ✓ User sign-up with various inputs #3   64 ms
   ✓ User sign-up with various inputs #4   22 ms
   ✓ User sign-up with various inputs #5   17 ms
   ✓ User sign-up with various inputs #6   18 ms
   ✓ User sign-up with various inputs #7   15 ms
   ✓ User sign-up with various inputs #8   18 ms
   ✓ User sign-up with various inputs #9   22 ms
   ✓ User sign-up with various inputs #10  23 ms
   ✓ User sign-up with various inputs #11  19 ms
   ✓ User sign-up with various inputs #12  14 ms
```