**Mockito Assignment**

You have been given user application code. You need to write Mockito testcases as described below:

1. When username is “tom” & password “tom123”, authentication should be successful.
2. When username or password is blank or null, authentication method will throw NullPointerException.
3. Confirm the mocked register() method is executed within 200 ms.
4. Verify that UserApp.signup(xx) call internally calls register method on UserService.
5. Configure mocking so that Mockito calls actual authenticate() method instead of mocked one using doCallRealMethod().
6. Reset the mocked UserService & create its partial mock using spying.
7. Confirm that Mockito is calling actual authenticate() method instead of mocked one.

**Shared code:**

*public class UserApp {*

*UserService userService;*

*public UserApp(UserService userService) {*

*this.userService = userService;*

*}*

*public boolean login(String username, String password) {*

*return this.userService.authenticate(username, password);*

*}*

*public UserDTO signup(UserDTO userDto) {*

*return this.userService.register(userDto);*

*}*

*}*

*public class UserDTO {*

*private String username;*

*private String password;*

*private String firstName;*

*}*

*public class DBUtils {*

*public static Connection getDBConnection() throws SQLException, ClassNotFoundException {*

*Class.forName("com.mysql.jdbc.Driver");*

*return DriverManager.getConnection("jdbc:mysql://localhost:3307/test", "root", "root");*

*}*

*}*

*public interface UserService {*

*boolean authenticate(String username, String password);*

*UserDTO register(UserDTO userDto);*

*}*

*public class UserServiceImpl implements UserService {*

*@Override*

*public boolean authenticate(String username, String password) {*

*try {*

*Connection dbcon = DBUtils.getDBConnection();*

*Statement stmt = dbcon.createStatement();*

*ResultSet rs = stmt.executeQuery("SELECT \* FROM USERS WHERE username='" + username + "' AND password='" + password + "'");*

*if(rs.next()) {*

*return true;*

*}*

*}*

*catch(SQLException | ClassNotFoundException e) {*

*e.printStackTrace();*

*return false;*

*}*

*return false;*

*}*

*@Override*

*public UserDTO register(UserDTO userDto) {*

*try {*

*Connection dbcon = DBUtils.getDBConnection();*

*Statement stmt = dbcon.createStatement();*

*stmt.executeUpdate("INSERT INTO USERS VALUES('" + userDto.getUsername() + "','" + userDto.getPassword() + "','" + userDto.getFirstName() + "')");*

*}*

*catch(SQLException | ClassNotFoundException e) {*

*e.printStackTrace();*

*return null;*

*}*

*return userDto;*

*}*

*}*