# Activity Tracker

1.0

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# Contents

# Chapter 1

# COMP-2005 Activity Logger Documentation

This website contains documentation for all source code contained in the *Activity Logger* application. Class and method documentation may be accessed in HTML format using the left-hand side navigation bar, or the search box at the top right-hand side of the page.

For offline viewing, a precompiled PDF of this documentation has been made available `here` Note, however, that this document does *not* contain the full source code which is included in formatted HTML on this website.

More detailed information about contributions, repository branches, and commit history is available by browsing the `GitHub repository` for this project.

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Here are the classes, structs, unions and interfaces with brief descriptions:

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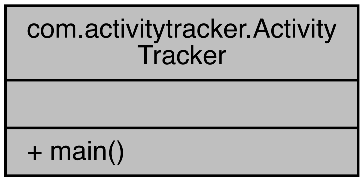
- enum UserAttribute

# Chapter 7

# Class Documentation

## 7.1 com.activitytracker.ActivityTracker Class Reference

Collaboration diagram for com.activitytracker.ActivityTracker:



### Static Public Member Functions

- static void main (final String[ ] args)

### 7.1.1 Detailed Description

The main program class.

Definition at line 28 of file ActivityTracker.java.

## 7.1.2 Member Function Documentation

### 7.1.2.1 main()

```
static void com.activitytracker.ActivityTracker.main (
            final String [] args ) [static]
```

The main program entry point.

Definition at line 33 of file ActivityTracker.java.

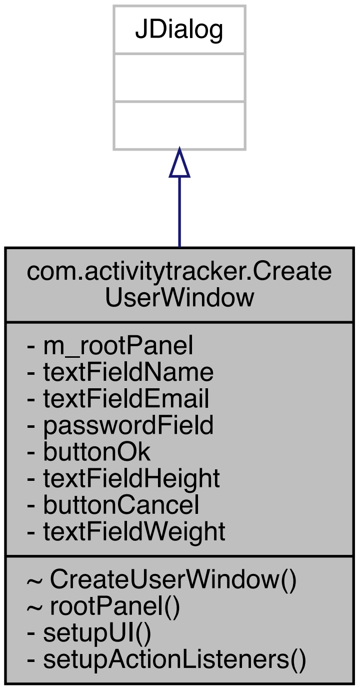
```
                                                   {

          // Create singleton instance of DBManager
          DBManager dbManager = new DBManager();
          if (!dbManager.init("data.db")) {
              System.err.println("Failed to initialize DBManager");
              System.exit(1);
          }

          // Set Look and Feel
          try {
              UIManager.setLookAndFeel(new MaterialLookAndFeel());
          }
          catch (final UnsupportedLookAndFeelException e) {
              e.printStackTrace();
          }
          // Get desktop resolution of default monitor (in case of multi-monitor setups)
          final GraphicsDevice gd = GraphicsEnvironment.getLocalGraphicsEnvironment().getDefaultScreenDevice(
      );

          final JFrame frame = new JFrame("Activity Logger");

          final String logoPath = "./assets/logo.png";
          ImageIcon imgIcon = new ImageIcon(ActivityTracker.class.getResource(logoPath));
          frame.setIconImage(imgIcon.getImage());
          frame.setContentPane(new LoginWindow((Void) -> {
              frame.setContentPane(new MainWindow().rootPanel());
              frame.validate();
              frame.repaint();
          }).rootPanel());
          frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
          frame.pack();

          // Set window size to be 1/2 of screen dimensions
          frame.setSize(gd.getDisplayMode().getWidth() / 2, gd.getDisplayMode().getHeight() / 2);
          frame.setLocationRelativeTo(null); // Center window
          frame.setVisible(true);
      }
```

The documentation for this class was generated from the following file:

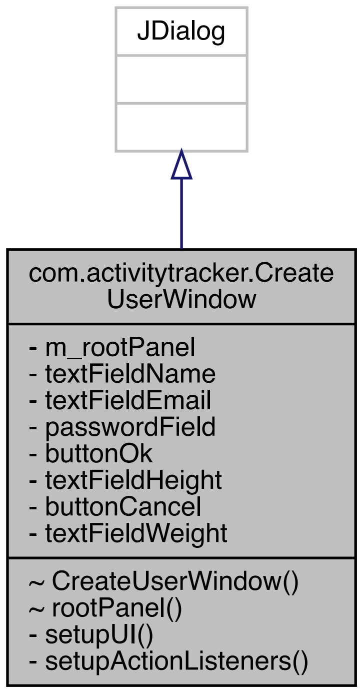
- app/src/com/activitytracker/ActivityTracker.java

## 7.2 com.activitytracker.CreateUserWindow Class Reference

Inheritance diagram for com.activitytracker.CreateUserWindow:



Collaboration diagram for com.activitytracker.CreateUserWindow:



## Package Functions

- CreateUserWindow ()
- JPanel rootPanel ()

## Private Member Functions

- void setupUI ()
- void setupActionListeners ()

## Private Attributes

- JPanel m_rootPanel
- JTextField textFieldName

- JTextField textFieldEmail
- JPasswordField passwordField
- JButton buttonOk
- JTextField textFieldHeight
- JButton buttonCancel
- JTextField textFieldWeight

### 7.2.1 Detailed Description

Definition at line 10 of file CreateUserWindow.java.

### 7.2.2 Constructor & Destructor Documentation

#### 7.2.2.1 CreateUserWindow()

`com.activitytracker.CreateUserWindow.CreateUserWindow ( ) [package]`

Definition at line 20 of file CreateUserWindow.java.

```
                       {

        setupUI();
        setupActionListeners();
    }
```

### 7.2.3 Member Function Documentation

#### 7.2.3.1 rootPanel()

`JPanel com.activitytracker.CreateUserWindow.rootPanel ( ) [package]`

Definition at line 53 of file CreateUserWindow.java.

```
                       {
        return m_rootPanel;
    }
```

#### 7.2.3.2 setupActionListeners()

`void com.activitytracker.CreateUserWindow.setupActionListeners ( ) [private]`

Definition at line 31 of file CreateUserWindow.java.

```
                                        {
        buttonOk.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {

                if (textFieldName.getText().isEmpty() ||
                    textFieldEmail.getText().isEmpty() ||
                    passwordField.getPassword().length == 0) {

                    return;
                }
            }
        });

        buttonCancel.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {

            }
        });
    }
```

#### 7.2.3.3 setupUI()

`void com.activitytracker.CreateUserWindow.setupUI ( ) [private]`

Definition at line 26 of file CreateUserWindow.java.

```
                           {
        MaterialUIMovement.add(buttonCancel, MaterialColors.GRAY_100);
        MaterialUIMovement.add(buttonOk, MaterialColors.GRAY_100);
    }
```

### 7.2.4 Member Data Documentation

#### 7.2.4.1 buttonCancel

`JButton com.activitytracker.CreateUserWindow.buttonCancel [private]`

Definition at line 17 of file CreateUserWindow.java.

#### 7.2.4.2 buttonOk

`JButton com.activitytracker.CreateUserWindow.buttonOk [private]`

Definition at line 15 of file CreateUserWindow.java.

#### 7.2.4.3 m_rootPanel

`JPanel com.activitytracker.CreateUserWindow.m_rootPanel [private]`

Definition at line 11 of file CreateUserWindow.java.

#### 7.2.4.4 passwordField

`JPasswordField com.activitytracker.CreateUserWindow.passwordField [private]`

Definition at line 14 of file CreateUserWindow.java.

#### 7.2.4.5 textFieldEmail

`JTextField com.activitytracker.CreateUserWindow.textFieldEmail [private]`

Definition at line 13 of file CreateUserWindow.java.

#### 7.2.4.6 textFieldHeight

`JTextField com.activitytracker.CreateUserWindow.textFieldHeight [private]`

Definition at line 16 of file CreateUserWindow.java.

#### 7.2.4.7 textFieldName

`JTextField com.activitytracker.CreateUserWindow.textFieldName [private]`

Definition at line 12 of file CreateUserWindow.java.

#### 7.2.4.8 textFieldWeight

`JTextField com.activitytracker.CreateUserWindow.textFieldWeight [private]`

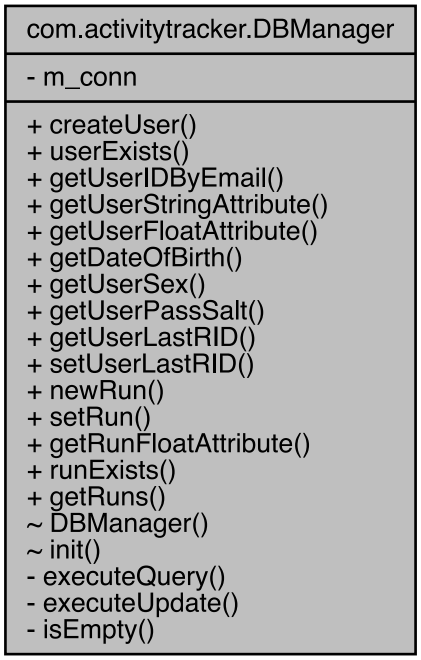
Definition at line 18 of file CreateUserWindow.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/CreateUserWindow.java

## 7.3 com.activitytracker.DBManager Class Reference

Collaboration diagram for com.activitytracker.DBManager:



### Public Member Functions

- void createUser (final String name, final String emailAddress, final int DOBYear, final int DOBMonth, final int DOBDay, final User.Sex sex, final float height, final float weight, final SecureString securePassword) throws AssertionError
- boolean userExists (final String emailAddress)
- int getUserIDByEmail (final String emailAddress)
- String getUserStringAttribute (final UserAttribute attribute, final int id)
- float getUserFloatAttribute (final UserAttribute attribute, final int id)
- Date getDateOfBirth (final int id)
- User.Sex getUserSex (final int id)
- byte [ ] getUserPassSalt (final int id)
- int getUserLastRID (final int id)

- void setUserLastRID (final int id, final int lastRID)
- int newRun (final int userID, final java.util.Date date, final float duration, final float distance, final float altitude_ascended, final float altitude_descended)
- void setRun (final int rID, final float duration, final float distance, final float altitude_↩ ascended, final float altitude_descended)
- float getRunFloatAttribute (final RunAttribute attribute, final int rID)
- boolean runExists (final int rID)
- Vector< Integer > getRuns (final int userID, final java.util.Date startDate, final java.util.Date endDate)

## Package Functions

- DBManager ()
- boolean init (final String dbURL)

## Private Member Functions

- ResultSet executeQuery (final String sqlQuery)
- boolean executeUpdate (final String sqlQuery)
- boolean isEmpty ()

## Private Attributes

- Connection m_conn = null

### 7.3.1 Detailed Description

Singleton class for the database. All classes and methods that interact with the database will use a method in this class.

Many times we are faced with the "chicken and egg" problem where we wish to create an object that is populated with information from the database. So the question one faces is, "does the object's constructor query the database (through the DBManager class, of course) for each attribute of the object that it wishes to retrieve, or do we directly interact with a DBManager method which will then return a User or Run object, for example?" We have decided to use the former methodology, with DBManager methods being as general as possible, and often accepting enum types which then are put into a switch to create the specific SQL query we wish to execute. This works best when all data returned is of the same data type (for example, the Workout class will have three float attributes at the time of writing so we use one method with return type of float for returning

Workout attributes). This does not work as well when the object requires data of multiple types — for example, the User class. In this case, we have split the DBManager methods into a single method for each attribute being returned.

Polymorphism could theoretically be used here to simply have a return type of Object, however this is not flexible and requires casting *all* returned data to the correct type in the invoking method.

Definition at line 29 of file DBManager.java.

## 7.3.2 Constructor & Destructor Documentation

### 7.3.2.1 DBManager()

`com.activitytracker.DBManager.DBManager ( )  [package]`

Creates a new DBManager object.

This should only be called once, from the main program, as DBManager is meant to be a *singleton* class.

This constructor takes no parameters as verification of the SQLite database is done in the init() method of this class, which returns information about whether the initialization was successful or not.

Definition at line 46 of file DBManager.java.

```
46                  {
47     }
```

## 7.3.3 Member Function Documentation

#### 7.3.3.1 createUser()

```
void com.activitytracker.DBManager.createUser (
            final String name,
            final String emailAddress,
            final int DOBYear,
            final int DOBMonth,
            final int DOBDay,
            final User.Sex sex,
            final float height,
            final float weight,
            final SecureString securePassword ) throws AssertionError
```

Adds a row for a user to the Users table in the SQLite database for the app.

Requires that the database tables exist and are in the correct format. If the user exists in the database this method raises an AssertionError exception.

Parameters

| | |
|---|---|
| *name* | User's name |
| *emailAddress* | User's email address; used to authenticate |
| *DOBYear* | The year the user was born |
| *DOBMonth* | The month the user was born |
| *DOBDay* | The day of month the user was born |
| *sex* | The user's sex; is either User.Sex.MALE or User.Sex.FEMALE |
| *height* | Floating point number of the user's height in metres |
| *weight* | Floating point number of the user's weight in kilograms |
| *securePassword* | A SecureString object containing the user's password, encrypted |

Definition at line 65 of file DBManager.java.

```
                                                                                                                {

        if (!userExists(emailAddress)) {
            String sqlQuery = "INSERT INTO Users (" +
                    "email_address, " +
                    "name, " +
                    "date_of_birth, " +
                    "sex, " +
                    "height, " +
                    "weight," +
                    "password_hash," +
                    "password_salt," +
                    "created_at" +
                    ") VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?)";
            byte sexByte = sex.equals(User.Sex.MALE) ? (byte) 1 : (byte) 0;
            java.sql.Date currentTime = new java.sql.Date(System.currentTimeMillis());
```

```
           Calendar c = Calendar.getInstance();
           c.set(DOBYear, DOBMonth, DOBDay);
           java.sql.Date dateOfBirth = new java.sql.Date(
                   c.get(Calendar.YEAR),
                   c.get(Calendar.MONTH),
                   c.get(Calendar.DAY_OF_MONTH)
           );

           try {
               PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
               stmt.setString(1, emailAddress);
               stmt.setString(2, name);
               stmt.setDate(3, dateOfBirth);
               stmt.setByte(4, sexByte);
               stmt.setFloat(5, height);
               stmt.setFloat(6, weight);
               stmt.setString(7, securePassword.toString());
                stmt.setBytes(8, securePassword.getSalt());
                stmt.setDate(9, currentTime);

                if (stmt.executeUpdate() != 1) {
                    System.err.println("User not added to database.");
                }

                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
            }
        }
        else {
            throw new AssertionError("User with email address '" + emailAddress + "' already exists.");
        }
    }
```

#### 7.3.3.2 executeQuery()

```
ResultSet com.activitytracker.DBManager.executeQuery (
             final String sqlQuery )  [private]
```

A wrapper method for processing *safe* SQL queries.

By safe we mean that the SQL query string is entirely hard-coded in the program source code. In other words, no user input is added. This is an important distinction as the former may leave the application vulnerable to SQL injection.

In such cases, a SQL PreparedStatement should be used.

Parameters

| | |
|---|---|
| *sqlQuery* | The SQL code to be executed. Must be a *SELECT* statement. |

Returns

> This method returns a ResultSet containing the returned row(s) and/or column(s) of the SQL query that was executed.

Definition at line 719 of file DBManager.java.

```
                                                           {
            ResultSet res = null;

            try {
                Statement stmt = m_conn.createStatement();
                res = stmt.executeQuery(sqlQuery);
                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
            }

            return res;
        }
```

#### 7.3.3.3 executeUpdate()

```
boolean com.activitytracker.DBManager.executeUpdate (
             final String sqlQuery )  [private]
```

A wrapper method for processing *safe* SQL queries.

By safe we mean that the SQL query string is entirely hard-coded in the program source code. In other words, no user input is added. This is an important distinction as the former may leave the application vulnerable to SQL injection.

In such cases, a SQL PreparedStatement should be used.

Parameters

| | |
|---|---|
| *sqlQuery* | The SQL code to be executed. Must be an *INSERT* or *UPDATE* statement. |

Returns

> This method returns a boolean indicating if the query was successful.

Definition at line 747 of file DBManager.java.

```
                                                          {
            try {
                Statement stmt = m_conn.createStatement();
                stmt.executeUpdate(sqlQuery);
                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
                return false;
            }

            return true;
        }
```

### 7.3.3.4 getDateOfBirth()

```
Date com.activitytracker.DBManager.getDateOfBirth (
             final int id )
```

Retrieves the user's date of birth (DOB) from the database.

At the time of writing, this method is only being used in the User constructor.

Parameters

| | |
|---|---|
| *id* | Unique ID used to associate information in the database to this user. |

Returns

This method returns a Date object containing the user's DOB (i.e., year, month, day).

Definition at line 302 of file DBManager.java.

```
                                              {
            Date DOB;
            java.sql.Date DOBResult;
            ResultSet res;
            String sqlQuery = "SELECT date_of_birth FROM Users WHERE id=?";
            try {
                PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
                stmt.setInt(1, id);
                res = stmt.executeQuery();
                DOBResult = res.getDate("date_of_birth");

                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
                return null;
```

```
        }
        DOB = new Date(DOBResult.getYear(), DOBResult.getMonth(), DOBResult.getDay());

        return DOB;
    }
```

### 7.3.3.5 getRunFloatAttribute()

```
float com.activitytracker.DBManager.getRunFloatAttribute (
            final RunAttribute attribute,
            final int rID )
```

Retrieves a run's attribute as a floating point number, where applicable, from the database.

This method accepts a RunAttribute enumeration type to specify what attribute it is returning from the database. Only certain attributes are accepted by this method, namely those that are stored as real values. Attributes stored as other data types should use the appropriate accessor method.

**Parameters**

| | |
|---|---|
| *attribute* | The attribute that the method is supposed to query the DB for and return the value of. Note that only certain RunAttribute types are supported in this method.<br>• When *attribute* is RunAttribute.DURATION, the run's duration is returned.<br>• When *attribute* is RunAttribute.DISTANCE, the run's cumulative distance is returned in metres.<br>• When *attribute* is RunAttribute.ALTITUDE_ASCENDED, the run's cumulative altitude climbed is returned in metres<br>• When *attribute* is RunAttribute.ALTITUDE_DESCENDED, the run's cumulative altitude descended is returned in metres |
| *rID* | Unique ID corresponding to the row in the Runs table that we wish to query. If such an ID does not exist, *0.0f* will be returned. |

**Returns**

This method returns a float containing run attribute as specified by the *attribute* parameter.

Definition at line 588 of file DBManager.java.

```
                                                                                  {
        ResultSet res;
        PreparedStatement stmt;
        String sqlQuery, columnLabel;
        float attrVal = 0.0f;
        switch (attribute) {
            case DURATION:
                columnLabel = "duration";
                sqlQuery = "SELECT " + columnLabel + " FROM Runs WHERE id=?";
                break;
            case DISTANCE:
                columnLabel = "distance";
                sqlQuery = "SELECT " + columnLabel + " FROM Runs WHERE id=?";
                break;
            case ALTITUDE_ASCENDED:
                columnLabel = "altitude_ascended";
                sqlQuery = "SELECT " + columnLabel + " FROM Runs WHERE id=?";
                break;
            case ALTITUDE_DESCENDED:
                columnLabel = "altitude_descended";
                sqlQuery = "SELECT " + columnLabel + " FROM Runs WHERE id=?";
                break;
            default:
                return attrVal;
        }
        if (runExists(rID)) {
            try {
                stmt = m_conn.prepareStatement(sqlQuery);
                stmt.setInt(1, rID);
                res = stmt.executeQuery();
                attrVal = res.getFloat(columnLabel);
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
            }
        }
        else {
            System.err.println("Run " + Integer.toString(rID) + " does not exist. Cannot get " +
      columnLabel + ".");
        }

        return attrVal;

    }
```

#### 7.3.3.6 getRuns()

```
Vector<Integer> com.activitytracker.DBManager.getRuns (
            final int userID,
            final java.util.Date startDate,
            final java.util.Date endDate )
```

Queries the database for all runs by a user with user ID *userID* between *startDate* and *endDate*.

Parameters

| | |
|---|---|
| *userID* | The ID of the user whose runs we wish to retrieve. |
| *startDate* | The lower bound of the interval we wish to retrieve runs for. |
| *endDate* | The uppper bound of the interval we wish to retrieve runs for. |

Returns

Returns a vector containing run IDs for each run that meets the search criteria.

Definition at line 678 of file DBManager.java.

```
          {
        ResultSet res;
        Vector<Integer> runs = new Vector<>();
        try {
            PreparedStatement stmt = m_conn.prepareStatement(
                    "SELECT id FROM Runs WHERE user_id=? AND date BETWEEN ? AND ?;");
            stmt.setInt(1, userID);
            stmt.setLong(2, startDate.getTime());
            stmt.setLong(3, endDate.getTime());

            res = stmt.executeQuery();

            if (res.isClosed())
                System.err.println("Result set closed; cannot get any data?");

            while (res.next()) {
                runs.add(res.getInt("id"));
            }
            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

        return runs;
    }
```

#### 7.3.3.7 getUserFloatAttribute()

```
float com.activitytracker.DBManager.getUserFloatAttribute (
            final UserAttribute attribute,
            final int id )
```

Retrieves a user's attribute in floating point format, when applicable, from the database's Users table.

This method accepts a UserAttribute enumeration type to specify what attribute it is returning from the database. Only certain attributes are accepted by this method, namely those that are stored as real values. Attributes stored as other data types should use the appropriate accessor method.

Parameters

| | |
|---|---|
| *attribute* | The attribute that the method is supposed to query the DB for and return the value of. Note that only certain UserAttribute types are supported in this method. • When *attribute* is UserAttribute.WEIGHT, this method retrieves the user's weight from the database. • When *attribute* is UserAttribute.HEIGHT, this method retrieves the user's height from the database. |
| *id* | Unique ID used to associate information in the database to this user. |

Returns

Returns a floating point number corresponding to the UserAttribute passed to the method, for the user specified by *id*.

Definition at line 261 of file DBManager.java.

```
                                                                                    {
        float attrVal;
        ResultSet res;
        String sqlQuery, columnLabel;
        switch (attribute) {
            case WEIGHT:
                columnLabel = "weight";
                sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
                break;
            case HEIGHT:
                columnLabel = "height";
                sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
                break;
            default:
                throw new AssertionError("Incorrect UserAttribute enumeration type passed to method.");
        }
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setInt(1, id);
            res = stmt.executeQuery();
            attrVal = res.getFloat(columnLabel);

            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
            return 0.0f;
        }

        return attrVal;
    }
```

#### 7.3.3.8 getUserIDByEmail()

```
int com.activitytracker.DBManager.getUserIDByEmail (
          final String emailAddress )
```

As we are using the user's email address as their identifying attribute, they will supply this when they log in. Hence, as the database relates everything to the user's unique ID, we must retrieve this ID given the email address.

The logic behind this method relies on the database Users table structure making *email_address* a unique field.

Parameters

| | |
|---|---|
| *emailAddress* | The user's email address with which they authenticate. |

Returns

This method returns a unique integer corresponding to the row in the database's Users table that stores user information for user with email address *emailAddress*.

Definition at line 159 of file DBManager.java.

```
                                                          {
        int id = 0;
        ResultSet res;
        String sqlQuery = "SELECT id FROM Users WHERE ‘email_address‘=?";
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setString(1, emailAddress);
            res =  stmt.executeQuery();
            id = res.getInt("id");

            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

        return id;
    }
```

#### 7.3.3.9 getUserLastRID()

```
int com.activitytracker.DBManager.getUserLastRID (
          final int id )
```

Retrieves the last workout ID that the user added as an integer from the database.

This is used because of the format in which the data is supplied. As the only way to denote a new workout is by recieving (0, 0, 0) in the input file, if the input is *not* (0, 0, 0), we need to update the previously added workout with the latest line. Hence we need some way of storing an identifier for this workout. As this is unique to each user, we have chosen to store this in the Users table of the database.

Parameters

|  |  |
|---|---|
| *id* | Unique ID used to associate information in the database to this user. |

Returns

An integer corresponding to the last row in the Workouts table that the user created.

Definition at line 399 of file DBManager.java.

```
399                                              {
400         int rID = 0;
401         ResultSet res;
402         String columnLabel = "last_run";
403         String sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
404         try {
405             PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
406             stmt.setInt(1, id);
407             res = stmt.executeQuery();
408             rID = res.getInt(columnLabel);
409             stmt.close();
410         }
411         catch (final SQLException e) {
412             System.err.println(e.getMessage());
413         }
414 
415         return rID;
416     }
```

### 7.3.3.10 getUserPassSalt()

```
byte [] com.activitytracker.DBManager.getUserPassSalt (
          final int id )
```

Retrieves a byte array containing the salt used to encrypt the user's password from the database.

This is necessary because to compare a candidate password supplied by a user to a known (encrypted) password stored in the database, we must encrypt the new candidate password using the same salt as was originally used.

Parameters

|  |  |
|---|---|
| *id* | Unique ID used to associate information in the database to this user. |

Returns

This method returns a byte array containing the user's password encryption salt.

Definition at line 370 of file DBManager.java.

```
                                                 {
        byte[] passSalt;
        ResultSet res;
        String sqlQuery = "SELECT password_salt FROM Users WHERE id=?";
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setInt(1, id);
            res = stmt.executeQuery();
            passSalt = res.getBytes("password_salt");
            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
            return null;
        }
        return passSalt;
    }
```

#### 7.3.3.11 getUserSex()

```
User.Sex com.activitytracker.DBManager.getUserSex (
            final int id )
```

Retrieves the user's gender from the database.

We have chosen to represent gender in the SQLite database with the data type BIT(1), where 1 denotes male and 0 denotes female. Hence, if the database contains 1 this method returns User.Sex.MALE and if the database contains 0 then this method returns User.Sex.FEMALE.

At the time of writing, this method is only being used in the User constructor.

Parameters

|  |  |
|---|---|
| *id* | Unique ID used to associate information in the database to this user. |

Returns

This method returns a User.Sex enumeration type corresponding to the user's gender.

Definition at line 337 of file DBManager.java.

```
                                              {
            byte sex;
            ResultSet res;
            String sqlQuery = "SELECT sex FROM Users WHERE id=?";
            try {
                PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
                stmt.setInt(1, id);
                res = stmt.executeQuery();
                sex = res.getByte("sex");

                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
                return null;
            }

            if (sex == (byte) 1)
                return User.Sex.MALE;
            else
                return User.Sex.FEMALE;
        }
```

### 7.3.3.12 getUserStringAttribute()

```
String com.activitytracker.DBManager.getUserStringAttribute (
             final UserAttribute attribute,
             final int id )
```

This method retrieves a string, varchar, text, or char field, when applicable, from the database's Users table.

This method accepts a UserAttribute enumeration type to specify what attribute it is returning from the database. Only certain attributes are accepted by this method, namely those that are stored as string-like values. Attributes stored as other data types should use the appropriate accessor method.

Parameters

| | |
|---|---|
| *attribute* | The attribute that the method is supposed to query the DB for and return the value of. Note that only certain UserAttribute types are supported in this method. <br> • When *attribute* is UserAttribute.PASSWORD, this method retrieves the user's encrypted password from the database. Typically this will be used in the following sequence of calls: <br> 1. User attempts to authenticate with email and password <br> 2. Their unique ID is retrieved from the database using DBManager::getUserIDByEmail() <br> 3. Their ID is used to retrieve the hash of their password (i.e., this method is called) <br> 4. The returned string from this method is compared a SecureString generated from the candidate password supplied by the user when authenticating. <br> • When *attribute* is UserAttribute.NAME, this method retrieves the user's full name from the database (e.g., "John Doe"). <br> • When *attribute* is UserAttribute.EMAIL_ADDRESS, this method retrieves the user's email address from the database. Note that this is likely somewhat redundant as the user will always be required to authenticate by providing their email address and hence it will already be available to the User constructor, which is likely what is invoking this method. |
| *id* | Unique ID used to associate information in the database to this user. |

Returns

This method returns a string containing attribute specified by the *attribute* parameter for the user specified by the *id* parameter.

Definition at line 207 of file DBManager.java.

```
                                                                                         {
            String name;
            ResultSet res;
            String sqlQuery, columnLabel;
            switch (attribute) {
                case PASSWORD:
                    columnLabel = "password_hash";
                    sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
                    break;
                case NAME:
                    columnLabel = "name";
                    sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
                    break;
                case EMAIL_ADDRESS:
                    columnLabel = "email_address";
                    sqlQuery = "SELECT " + columnLabel + " FROM Users WHERE id=?";
                    break;
                default:
                    throw new AssertionError("Incorrect UserAttribute enumeration type passed to method.");
            }
            try {
                PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
                stmt.setInt(1, id);
                res = stmt.executeQuery();
                name = res.getString(columnLabel);

                stmt.close();
            }
            catch (final SQLException e) {
                System.err.println(e.getMessage());
                return null;
            }

            return name;
        }
```

#### 7.3.3.13 init()

```
boolean com.activitytracker.DBManager.init (
            final String dbURL )  [package]
```

Initializes a connection to the SQLite database.

As no work is done in the DBManager() constructor, this method should be called immediately after creating the single instance of DBManager that the application is to use.

This method will attempt to connect to the database file specified by the *dbURL* parameter, creating the file and all required tables if it/they do not exist. You are encouraged to view the source code of this method for more information about the database schema used.

If all of the above is successful, the method returns True. Otherwise, False is returned.

Parameters

| | |
|---|---|
| *dbURL* | A file system path to the SQLite database file. |

Returns

This method returns True if the database can be initialized, or False otherwise.

Definition at line 801 of file DBManager.java.

```
                                     {
        try {
            m_conn = DriverManager.getConnection("jdbc:sqlite:" + dbURL);
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
            return false;
        }
        System.out.println("Opened database successfully.");

        if (isEmpty()) {
            System.out.println("Creating tables...");

            // Create users table
            String sqlQuery = "CREATE TABLE USERS (" +
                    "    id            INTEGER PRIMARY KEY ASC AUTOINCREMENT NOT NULL," +
                    "    email_address STRING  NOT NULL UNIQUE ON CONFLICT FAIL," +
                    "    name          STRING  NOT NULL," +
                    "    date_of_birth DATETIME    NOT NULL," +
                    "    sex           BIT(1)  NOT NULL," +
                    "    height        REAL    NOT NULL," +
                    "    weight        REAL    NOT NULL," +
                    "    password_hash STRING  NOT NULL," +
                    "    password_salt BLOB    NOT NULL," +
                    "    last_run      INTEGER NOT NULL DEFAULT 0," +
                    "    created_at    DATETIME    NOT NULL" +
                    ")";

            if (!executeUpdate(sqlQuery)) {
                return false;
            }

            // Create workouts table
            sqlQuery = "CREATE TABLE RUNS (" +
                    "    id                  INTEGER PRIMARY KEY ASC AUTOINCREMENT NOT NULL," +
                    "    user_id             INTEGER NOT NULL REFERENCES USERS (id)," +
                    "    date                DATETIME    NOT NULL," +
                    "    duration            REAL    NOT NULL," + // seconds
                    "    distance            REAL    NOT NULL," + // metres
                    "    altitude_ascended   REAL    NOT NULL," + // metres
                    "    altitude_descended  REAL    NOT NULL" + // metres
                    ")";

            if (!executeUpdate(sqlQuery)) {
                return false;
            }

            // Create friends table
            sqlQuery = "CREATE TABLE FRIENDS (" +
                    "    id            INTEGER  PRIMARY KEY ASC AUTOINCREMENT NOT NULL," +
                    "    sender        INTEGER  NOT NULL REFERENCES USERS (id)," +
                    "    receiver      INTEGER  REFERENCES USERS (id)," +
                    "    send_date     DATETIME NOT NULL," +
                    "    confirm_date  DATETIME DEFAULT NULL" +
                    ")";

            if (!executeUpdate(sqlQuery)) {
                return false;
            }

        }

        return true;
    }
```

### 7.3.3.14 isEmpty()

```
boolean com.activitytracker.DBManager.isEmpty ( ) [private]
```

Returns a boolean value depending on whether or not the database is populated.

This is done by retrieving tables in the database and checking if this iterator has a next(). If not then there are no tables in the database and we consider it to be empty.

**Returns**

Returns True if there are tables in the database, False otherwise.

Definition at line 769 of file DBManager.java.

```
                              {

        try {
            final DatabaseMetaData dbmd = m_conn.getMetaData();
            final String[] types = {"TABLE"};
            final ResultSet rs = dbmd.getTables(null, null, "%", types);

            return !rs.next();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
            return true;
        }

    }
```

### 7.3.3.15 newRun()

```
int com.activitytracker.DBManager.newRun (
            final int userID,
            final java.util.Date date,
            final float duration,
            final float distance,
            final float altitude_ascended,
            final float altitude_descended )
```

Creates a new row in the Runs table with the attributes provided as parameters.

In particular, this method will be called when Run::newRunDataPoint() receives (0, 0, 0) for (*duration*, *distance*, *altitude*).

Parameters

| | |
|---|---|
| *userID* | Unique ID used to associate information in the database to this user. |
| *date* | Date that the run was completed. |
| *duration* | Duration of the run in seconds. |
| *distance* | Distance ran in metres. |
| *altitude_ascended* | Cumulative altitude climbed in metres. |
| *altitude_descended* | Cumulative altitude descended in metres. |

Returns

Returns a unique integer corresponding to the new row in the SQLite Workouts table by which the new entry can be identified.

Definition at line 461 of file DBManager.java.

```
                                                                                     {

        java.sql.Date date1 = new java.sql.Date(date.getYear(), date.getMonth(), date.getDay());

        int rID = 0;
        ResultSet res;
        String sqlInsertQuery = "INSERT INTO Runs (" +
                "user_id," +
                "date," +
                "duration," +
                "distance," +
                "altitude_ascended," +
                "altitude_descended" +
                ") VALUES (?, ?, ?, ?, ?, ?)";
        String sqlSelectQuery = "SELECT id FROM Runs WHERE " +
                "user_id=? AND " +
                "date=? AND " +
                "duration=? AND " +
                "distance=? AND " +
                "altitude_ascended=? AND " +
                "altitude_descended=?";

        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlInsertQuery);
            stmt.setInt(1, userID);
            stmt.setDate(2, date1);
            stmt.setFloat(3, duration);
            stmt.setFloat(4, distance);
            stmt.setFloat(5, altitude_ascended);
            stmt.setFloat(6, altitude_descended);

            if (stmt.executeUpdate() != 1) {
                System.err.println("Run not added to database.");
            }

            stmt.close();

            // Pass back in the stuff we just created to get the right row ID
            // Look at a better way of doing this with OUTPUT clause of INPUT statement
            stmt = m_conn.prepareStatement(sqlSelectQuery);
            stmt.setInt(1, userID);
            stmt.setDate(2, date1);
            stmt.setFloat(3, duration);
            stmt.setFloat(4, distance);
            stmt.setFloat(5, altitude_ascended);
            stmt.setFloat(6, altitude_descended);

            res = stmt.executeQuery();
            rID = res.getInt("id");
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

        return rID;
    }
```

#### 7.3.3.16 runExists()

```
boolean com.activitytracker.DBManager.runExists (
            final int rID )
```

Determines if a given run ID exists in the database.

Parameters

| | |
|---|---|
| *rID* | Unique ID corresponding to the row in the Runs table that we wish to check exists. |

Returns

This method returns True if the run row with ID *WOID* exists in the database, or False otherwise.

Definition at line 639 of file DBManager.java.

```
                                             {
        ResultSet res;
        String sqlQuery = "SELECT COUNT(*) as count FROM Runs WHERE id=?";
        boolean exists = false;
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setInt(1, rID);
            res = stmt.executeQuery();
            switch (res.getInt("count")) {
                case 0:
                    exists = false;
                    break;
                case 1:
                    exists = true;
                    break;
                default:
                    exists = true;
                    System.err.println("More than one run for ID " +
                            Integer.toString(rID) + ". Something isn't right.");
                    break;
            }

        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

        return exists;
    }
```

#### 7.3.3.17 setRun()

```
void com.activitytracker.DBManager.setRun (
            final int rID,
            final float duration,
            final float distance,
            final float altitude_ascended,
            final float altitude_descended )
```

Updates a run entry in the database as new information becomes available from the input file.

In particular, this method is called when Run::newRunDataPoint() receives non-(0, 0, 0) input for (*duration*, *distance*, *altitude*).

This method will not be called directly by the application, rather it is called from Run::newRunDataPoint(). Hence that method will take care of adding/subtracting to/from the current stored values for *duration*, *distance*, and *altitude* — here we just take the input and put it in the database.

Parameters

| | |
|---|---|
| *rID* | Unique ID used to identify a run in the database. |
| *duration* | The number of seconds the user's run lasted. |
| *distance* | The cumulative number of metres the user ran. |
| *altitude_ascended* | The cumulative number of metres the user climbed. |
| *altitude_descended* | The cumulative number of metres the user descended. |

Definition at line 536 of file DBManager.java.

```
{
        String sqlQuery = "UPDATE Runs SET " +
                "duration = ?, " +
                "distance = ?, " +
                "altitude_ascended=?, " +
                "altitude_descended=? " +
                "WHERE id=? ";
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setFloat(1, duration);
            stmt.setFloat(2, distance);
            stmt.setFloat(3, altitude_ascended);
            stmt.setFloat(4, altitude_descended);
            stmt.setInt(5, rID);

            int result = stmt.executeUpdate();
            System.err.println(Integer.toString(result) + " rows updated in setRun().");
            if (result != 1) {
                System.err.println("Run not updated in database.");
            }

            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

    }
```

#### 7.3.3.18 setUserLastRID()

```
void com.activitytracker.DBManager.setUserLastRID (
            final int id,
            final int lastRID )
```

Updates a user's last run ID in the database.

This method will be used to update the run that a particular user last created. This is used when creating new run as the format of the input file requires that we maintain a record of what run we must update if the next line in the file is *not* (0, 0, 0).

See getUserLastRID() for more information on the user of the *last_run* field in the database.

Parameters

| | |
|---|---|
| *id* | Unique ID used to associate information in the database to this user. |
| *lastRID* | Integer corresponding to the last row in the Workouts table that the user with ID *id* created. |

Definition at line 430 of file DBManager.java.

```
                                                                {
        String sqlQuery = "UPDATE Users SET last_run=? WHERE id=?";
        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setInt(1, lastRID);
            stmt.setInt(2, id);
            if (stmt.executeUpdate() != 1) {
                System.err.println("User’s last run was not updated correctly.");
            }
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }
    }
```

#### 7.3.3.19 userExists()

```
boolean com.activitytracker.DBManager.userExists (
             final String emailAddress )
```

The DBManager::userExists() method is designed to facilitate the user experience (UX) design choice of users creating one account to the app and logging in with an existing account for future use. This maintains saved (persistent) data and helps enforce the unique constraint placed on the *email_address* field in the database (again, as users are authenticating using their email address as a user name to identify themselves).

Parameters

| | |
|---|---|
| *emailAddress* | The user's email address for which we are checking existence. We use email address here because this is what the user uses to log in to the app. |

Returns

True if the user exists in the database, false otherwise.

Definition at line 128 of file DBManager.java.

```
                                                          {
        String sqlQuery = "SELECT COUNT(*) AS count FROM Users WHERE ‘email_address‘=?";
        boolean exists = false;

        try {
            PreparedStatement stmt = m_conn.prepareStatement(sqlQuery);
            stmt.setString(1, emailAddress);
            ResultSet res = stmt.executeQuery();
            exists = res.getInt("count") > 0;

            stmt.close();
        }
        catch (final SQLException e) {
            System.err.println(e.getMessage());
        }

        return exists;
    }
```

### 7.3.4 Member Data Documentation

#### 7.3.4.1 m_conn

`Connection com.activitytracker.DBManager.m_conn = null [private]`

The *m_conn* variable in the DBManager class is initially assigned the value of *null*.

When DBManager::init() is invoked, it is made to be the connection to the database and is subsequently used each time a new SQL statement is created.

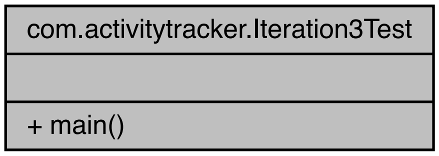
Definition at line 36 of file DBManager.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/DBManager.java

## 7.4 com.activitytracker.Iteration3Test Class Reference

Collaboration diagram for com.activitytracker.Iteration3Test:



## Static Public Member Functions

- static void main (String[ ] args)

### 7.4.1 Detailed Description

Definition at line 12 of file Iteration3Test.java.

### 7.4.2 Member Function Documentation

#### 7.4.2.1 main()

```
static void com.activitytracker.Iteration3Test.main (
          String [] args ) [static]
```

Definition at line 14 of file Iteration3Test.java.

```
                                             {

           // Iteration 1 begins here

           User john = null;

           DBManager dbManager = new DBManager();
           if (!dbManager.init("data.db")) {
               System.err.println("Failed to initialize DBManager");
               System.exit(1);
           }

           System.out.println("Attempting to create user...");

           if (!dbManager.userExists("jdoe@mac.com"))
               User.createUser(
                       dbManager,
                       "John Doe",
                       "jdoe@mac.com",
                       1997,
                       12,
                       12,
                       User.Sex.MALE,
                       1.6764f,
                       54.4310844f,
                       "My Very Secure Password"
               );
           else
               System.out.println("User already exists.");



```

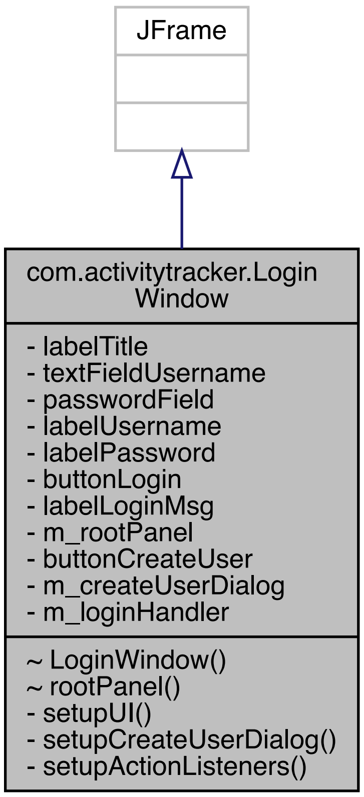
```
        if (dbManager.userExists("jdoe@mac.com"))
            System.out.println("John Doe was created!");
        else
            System.out.println("User was NOT created.");


        System.out.println("Testing incorrect password...");

        try {
            john = new User(dbManager,"jdoe@mac.com", "Some Incorrect Password");
        }
        catch (final AuthenticationException e) {
            System.out.println("Incorrect password used; authentication failed.");
        }

        System.out.println("Authenticating user...");

        try {
            john = new User(dbManager,"jdoe@mac.com", "My Very Secure Password");
        }
        catch (final AuthenticationException e) {
            System.out.println("Test failed; user could not be authenticated.");
        }

        // Iteration 1 ended here

        // Iteration 2 begins here

        if (john !=  null) {
            Date today = new Date();
            try {
                Run.bulkImport(dbManager, john, "/Users/jacobhouse/Google Drive File Stream/My
    Drive/Documents/Courses/Computer Science/COMP-2005 Software Engineering/Final
    Project/comp2005-activity-tracker/app/InputWO.csv");
            }
            catch (final IOException e) {
                System.err.println(e.getMessage());
            }
        }
        else {
            System.out.println("John is null. Cannot execute phase 2.");
        }

        // Iteration 2 ends here
        // Iteration 3 begins here

        Date date = null;
        DateFormat sourceFormat = new SimpleDateFormat("dd-MM-yyyy");

        try {
            date = sourceFormat.parse("01-01-2018");
        }
        catch (final ParseException e) {
            System.err.println(e.getMessage());
        }

         Vector<Run> runs = Run.getRuns(dbManager, john, date, new Date());

         if (runs == null) {
             System.out.println("Runs is null.");
         } else if (runs.size() == 0)
             System.err.println("No runs in vector.");
         else
             for (Run run : runs) {
                 System.out.println("Retrieved run with ID " + Integer.toString(run.getID()));
             }


        // Iteration 3 ends here

    }
```

The documentation for this class was generated from the following file:

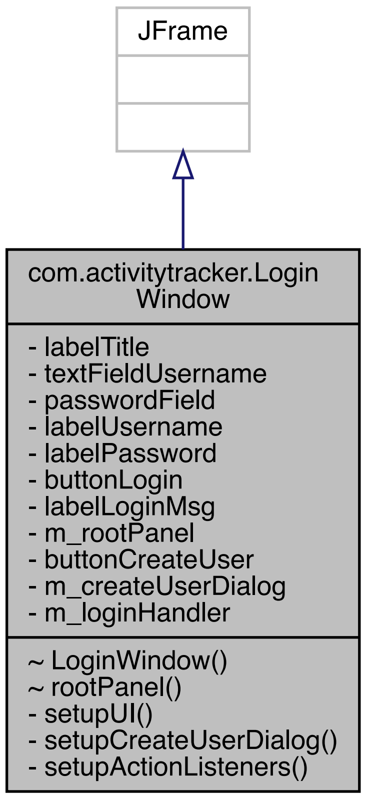
- app/src/com/activitytracker/Iteration3Test.java

## 7.5 com.activitytracker.LoginWindow Class Reference

Inheritance diagram for com.activitytracker.LoginWindow:



Collaboration diagram for com.activitytracker.LoginWindow:



## Package Functions

- LoginWindow (java.util.function.Consumer< Void > loginHandler)
- JPanel rootPanel ()

## Private Member Functions

- void setupUI ()
- void setupCreateUserDialog ()
- void setupActionListeners ()

## Private Attributes

- JLabel labelTitle
- JTextField textFieldUsername
- JPasswordField passwordField
- JLabel labelUsername
- JLabel labelPassword
- JButton buttonLogin
- JLabel labelLoginMsg
- JPanel m_rootPanel
- JButton buttonCreateUser
- JDialog m_createUserDialog = null
- java.util.function.Consumer< Void > m_loginHandler

### 7.5.1 Detailed Description

Definition at line 11 of file LoginWindow.java.

### 7.5.2 Constructor & Destructor Documentation

#### 7.5.2.1 LoginWindow()

```
com.activitytracker.LoginWindow.LoginWindow (
          java.util.function.Consumer< Void > loginHandler )  [package]
```

Definition at line 26 of file LoginWindow.java.

```
                                                              {
        m_loginHandler = loginHandler;

        setupUI();
        setupCreateUserDialog();
        setupActionListeners();
    }
```

### 7.5.3 Member Function Documentation

#### 7.5.3.1 rootPanel()

`JPanel com.activitytracker.LoginWindow.rootPanel ( ) [package]`

Definition at line 85 of file LoginWindow.java.

```
85                    {
86         return m_rootPanel;
87     }
```

#### 7.5.3.2 setupActionListeners()

`void com.activitytracker.LoginWindow.setupActionListeners ( ) [private]`

Definition at line 54 of file LoginWindow.java.

```
54                                     {
55 
56         // Login button
57         buttonLogin.addActionListener(new ActionListener() {
58             @Override
59             public void actionPerformed(ActionEvent e) {
60 
61                 // Do nothing if login fields are empty
62                 if (textFieldUsername.getText().isEmpty() ||
      passwordField.getPassword().length == 0) {
63                     return;
64                 }
65 
66                 // Change to verifyLogin()
67                 if (true) {
68                     m_loginHandler.accept(null);
69                     return;
70                 }
71 
72                 // Display error message
73             }
74         });
75 
76         // Create user button
77         buttonCreateUser.addActionListener(new ActionListener() {
78             @Override
79             public void actionPerformed(ActionEvent e) {
80                 m_createUserDialog.setVisible(true);
81             }
82         });
83     }
```

#### 7.5.3.3 setupCreateUserDialog()

`void com.activitytracker.LoginWindow.setupCreateUserDialog ( ) [private]`

Definition at line 41 of file LoginWindow.java.

```
                                        {

        // Get desktop resolution of default monitor (in case of multi-monitor setups)
        final GraphicsDevice gd = GraphicsEnvironment.getLocalGraphicsEnvironment().getDefaultScreenDevice(
      );

        m_createUserDialog = new JDialog(this, "Activity Logger | Create User", true);
        m_createUserDialog.setContentPane(new CreateUserWindow().
      rootPanel());
        m_createUserDialog.pack();
        // Set window size to be 1/2 of screen dimensions
        m_createUserDialog.setSize(gd.getDisplayMode().getWidth() / 2, gd.getDisplayMode(
      ).getHeight() / 2);
        m_createUserDialog.setLocationRelativeTo(this); // Center window
    }
```

#### 7.5.3.4 setupUI()

`void com.activitytracker.LoginWindow.setupUI ( ) [private]`

Definition at line 34 of file LoginWindow.java.

```
                           {
        MaterialUIMovement.add(buttonLogin, MaterialColors.GRAY_100);
        MaterialUIMovement.add(buttonCreateUser, MaterialColors.GRAY_100);

        labelLoginMsg.setVisible(false);
    }
```

### 7.5.4 Member Data Documentation

#### 7.5.4.1 buttonCreateUser

`JButton com.activitytracker.LoginWindow.buttonCreateUser [private]`

Definition at line 20 of file LoginWindow.java.

#### 7.5.4.2 buttonLogin

```
JButton com.activitytracker.LoginWindow.buttonLogin [private]
```

Definition at line 17 of file LoginWindow.java.

#### 7.5.4.3 labelLoginMsg

```
JLabel com.activitytracker.LoginWindow.labelLoginMsg [private]
```

Definition at line 18 of file LoginWindow.java.

#### 7.5.4.4 labelPassword

```
JLabel com.activitytracker.LoginWindow.labelPassword [private]
```

Definition at line 16 of file LoginWindow.java.

#### 7.5.4.5 labelTitle

```
JLabel com.activitytracker.LoginWindow.labelTitle [private]
```

Definition at line 12 of file LoginWindow.java.

#### 7.5.4.6 labelUsername

```
JLabel com.activitytracker.LoginWindow.labelUsername [private]
```

Definition at line 15 of file LoginWindow.java.

#### 7.5.4.7 m_createUserDialog

```
JDialog com.activitytracker.LoginWindow.m_createUserDialog = null  [private]
```

Definition at line 22 of file LoginWindow.java.

#### 7.5.4.8 m_loginHandler

```
java.util.function.Consumer<Void> com.activitytracker.LoginWindow.m_login←
Handler  [private]
```

Definition at line 24 of file LoginWindow.java.

#### 7.5.4.9 m_rootPanel

```
JPanel com.activitytracker.LoginWindow.m_rootPanel  [private]
```

Definition at line 19 of file LoginWindow.java.

#### 7.5.4.10 passwordField

```
JPasswordField com.activitytracker.LoginWindow.passwordField  [private]
```

Definition at line 14 of file LoginWindow.java.

#### 7.5.4.11 textFieldUsername

```
JTextField com.activitytracker.LoginWindow.textFieldUsername  [private]
```

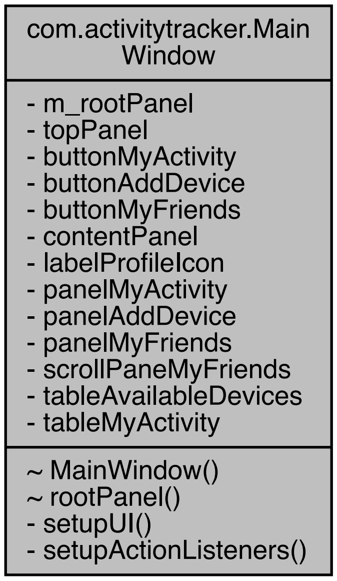
Definition at line 13 of file LoginWindow.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/LoginWindow.java

## 7.6 com.activitytracker.MainWindow Class Reference

Collaboration diagram for com.activitytracker.MainWindow:



### Package Functions

- MainWindow ()
- JPanel rootPanel ()

### Private Member Functions

- void setupUI ()
- void setupActionListeners ()

## Private Attributes

- JPanel m_rootPanel
- JPanel topPanel
- JButton buttonMyActivity
- JButton buttonAddDevice
- JButton buttonMyFriends
- JPanel contentPanel
- JLabel labelProfileIcon
- JPanel panelMyActivity
- JPanel panelAddDevice
- JPanel panelMyFriends
- JScrollPane scrollPaneMyFriends
- JTable tableAvailableDevices
- JTable tableMyActivity

## 7.6.1 Detailed Description

Definition at line 12 of file MainWindow.java.

## 7.6.2 Constructor & Destructor Documentation

### 7.6.2.1 MainWindow()

```
com.activitytracker.MainWindow.MainWindow ( ) [package]
```

Definition at line 27 of file MainWindow.java.

```
27                {
28         setupUI();
29         setupActionListeners();
30     }
```

## 7.6.3 Member Function Documentation

#### 7.6.3.1 rootPanel()

`JPanel com.activitytracker.MainWindow.rootPanel ( ) [package]`

Definition at line 84 of file MainWindow.java.

```
                       {
        return m_rootPanel;
    }
```

#### 7.6.3.2 setupActionListeners()

`void com.activitytracker.MainWindow.setupActionListeners ( ) [private]`

Definition at line 54 of file MainWindow.java.

```
                                        {
        // My Activity button
        buttonMyActivity.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent actionEvent) {
                panelMyActivity.setVisible(true);
                panelAddDevice.setVisible(false);
                panelMyFriends.setVisible(false);
            }
        });
        // Add Device button
        buttonAddDevice.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent actionEvent) {
                panelMyActivity.setVisible(false);
                panelAddDevice.setVisible(true);
                panelMyFriends.setVisible(false);
            }
        });
        // My Friends button
        buttonMyFriends.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent actionEvent) {
                panelMyActivity.setVisible(false);
                panelAddDevice.setVisible(false);
                panelMyFriends.setVisible(true);
            }
        });
    }
```

#### 7.6.3.3 setupUI()

`void com.activitytracker.MainWindow.setupUI ( ) [private]`

Definition at line 32 of file MainWindow.java.

```
                              {

        // Apply Material-defined hover effect to buttons
        Color coolGrey10 = new Color(99, 102, 106);
        Color coolGrey11 = new Color(83, 86, 90);
        MaterialUIMovement.add(buttonMyActivity, coolGrey11);
        MaterialUIMovement.add(buttonAddDevice, coolGrey11);
        MaterialUIMovement.add(buttonMyFriends, coolGrey11);

        // Load and scale logo into UI
        String logoPath = "./assets/logo.png";
        ImageIcon imageIcon = new ImageIcon(getClass().getResource(logoPath));
        final Image image = imageIcon.getImage(); // transform it
        final Image newimg = image.getScaledInstance(50, 50, java.awt.Image.SCALE_SMOOTH);
        imageIcon = new ImageIcon(newimg);  // transform it back
        labelProfileIcon.setIcon(imageIcon);

        panelMyActivity.setVisible(true);
        panelAddDevice.setVisible(false);
        panelMyFriends.setVisible(false);
    }
```

### 7.6.4 Member Data Documentation

#### 7.6.4.1 buttonAddDevice

`JButton com.activitytracker.MainWindow.buttonAddDevice [private]`

Definition at line 16 of file MainWindow.java.

#### 7.6.4.2 buttonMyActivity

`JButton com.activitytracker.MainWindow.buttonMyActivity [private]`

Definition at line 15 of file MainWindow.java.

#### 7.6.4.3 buttonMyFriends

`JButton com.activitytracker.MainWindow.buttonMyFriends [private]`

Definition at line 17 of file MainWindow.java.

#### 7.6.4.4 contentPanel

`JPanel com.activitytracker.MainWindow.contentPanel [private]`

Definition at line 18 of file MainWindow.java.

#### 7.6.4.5 labelProfileIcon

`JLabel com.activitytracker.MainWindow.labelProfileIcon [private]`

Definition at line 19 of file MainWindow.java.

#### 7.6.4.6 m_rootPanel

`JPanel com.activitytracker.MainWindow.m_rootPanel [private]`

Definition at line 13 of file MainWindow.java.

#### 7.6.4.7 panelAddDevice

`JPanel com.activitytracker.MainWindow.panelAddDevice [private]`

Definition at line 21 of file MainWindow.java.

#### 7.6.4.8 panelMyActivity

```
JPanel com.activitytracker.MainWindow.panelMyActivity [private]
```

Definition at line 20 of file MainWindow.java.

#### 7.6.4.9 panelMyFriends

```
JPanel com.activitytracker.MainWindow.panelMyFriends [private]
```

Definition at line 22 of file MainWindow.java.

#### 7.6.4.10 scrollPaneMyFriends

```
JScrollPane com.activitytracker.MainWindow.scrollPaneMyFriends [private]
```

Definition at line 23 of file MainWindow.java.

#### 7.6.4.11 tableAvailableDevices

```
JTable com.activitytracker.MainWindow.tableAvailableDevices [private]
```

Definition at line 24 of file MainWindow.java.

#### 7.6.4.12 tableMyActivity

```
JTable com.activitytracker.MainWindow.tableMyActivity [private]
```

Definition at line 25 of file MainWindow.java.

#### 7.6.4.13 topPanel

```
JPanel com.activitytracker.MainWindow.topPanel [private]
```

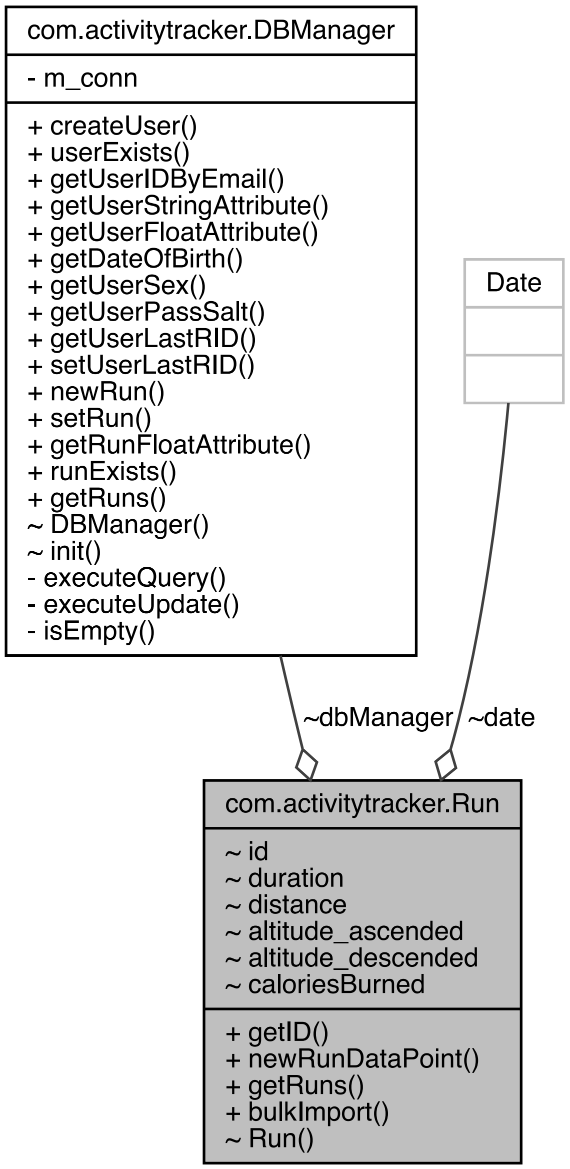
Definition at line 14 of file MainWindow.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/MainWindow.java

## 7.7 com.activitytracker.Run Class Reference

Collaboration diagram for com.activitytracker.Run:



### Public Member Functions

- int getID ()

## Static Public Member Functions

- static void newRunDataPoint (final DBManager dbManager, final User user, final float duration, final Date date, final float distance, final float altitude)
- static Vector< Run > getRuns (final DBManager dbManager, final User user, final Date startDate, final Date endDate)
- static void bulkImport (final DBManager dbManager, final User user, final String filePath) throws FileNotFoundException, IOException

## Package Functions

- Run (final DBManager dbManager, final int rID)

## Package Attributes

- int id
- Date date
- DBManager dbManager
- float duration
- float distance
- float altitude_ascended
- float altitude_descended
- long caloriesBurned = 0

### 7.7.1 Detailed Description

Used to logically instantiate a run.

Definition at line 17 of file Run.java.

### 7.7.2 Constructor & Destructor Documentation

#### 7.7.2.1 Run()

```
com.activitytracker.Run.Run (
          final DBManager dbManager,
          final int rID ) [package]
```

The Run() constructor is used to retrieve workout information from the database and instantiate each row of the Runs table in a logical format.

Parameters

| | |
|---|---|
| *dbManager* | The connection to the database. |
| *rID* | The run ID used to retrieve information from the database. |

Definition at line 60 of file Run.java.

```
                                                  {
        this.id = rID;
        this.dbManager = dbManager;
        this.duration = this.dbManager.getRunFloatAttribute(
   RunAttribute.DURATION, rID);
        this.distance = this.dbManager.getRunFloatAttribute(
   RunAttribute.DISTANCE, rID);
        this.altitude_ascended = this.dbManager.
   getRunFloatAttribute(RunAttribute.ALTITUDE_ASCENDED, rID);
        this.altitude_descended = this.dbManager.
   getRunFloatAttribute(RunAttribute.ALTITUDE_DESCENDED, rID);
    }
```

### 7.7.3 Member Function Documentation

#### 7.7.3.1 bulkImport()

```
static void com.activitytracker.Run.bulkImport (
             final DBManager dbManager,
             final User user,
             final String filePath ) throws FileNotFoundException, IOException  [static]
```

Opens and iterates through a file. The Run::newRunDataPoint() method is called for each line.

Parameters

| | |
|---|---|
| *dbManager* | Database connection with with the method interacts. |
| *user* | A User object corresponding to the use whose run(s) is/are being retrieved from the database. |
| *filePath* | The file to be iterated through |

Exceptions

| | |
|---|---|
| *FileNotFoundException* | Thrown if the file path given does not exist. |
| *IOException* | Thrown if there is an error reading or opening the file. |

Definition at line 177 of file Run.java.

```
                                                {
        BufferedReader br = new BufferedReader(new FileReader(filePath));
        String line = null;
        Date date = null;
        while ((line = br.readLine()) != null)
        {
            String[] attributes = line.split(",");
            String buffTime = attributes[0];
            String buffDistance = attributes[1];
            String buffAltitude = attributes[2];
            String buffDate = attributes[3];
            DateFormat sourceFormat = new SimpleDateFormat("dd-MM-yyyy");
            try {
                date = sourceFormat.parse(buffDate);
            }
            catch (final ParseException e) {
                System.err.println(e.getMessage());
            }

            // Convert strings to floats
            float fDur = Float.parseFloat(buffTime);
            float fDist = Float.parseFloat(buffDistance);
            float fAlt = Float.parseFloat(buffAltitude);

            newRunDataPoint(dbManager, user, fDur, date, fDist, fAlt);
        }
    }
```

### 7.7.3.2 getID()

`int com.activitytracker.Run.getID ( )`

Definition at line 207 of file Run.java.

```
                               {
        return this.id;
    }
```

### 7.7.3.3 getRuns()

```
static Vector<Run> com.activitytracker.Run.getRuns (
             final DBManager dbManager,
             final User user,
             final Date startDate,
             final Date endDate )  [static]
```

Retrieves a set of runs from the database. Returns the result as a vector of Run objects.

Parameters

| | |
|---|---|
| *dbManager* | Database connection with with the method interacts. |
| *user* | A User object corresponding to the use whose run(s) is/are being retrieved from the database. |
| *startDate* | The beginning of the interval for which we are retrieving workouts. |
| *endDate* | The end of the interval for which we are retrieving workouts. |

Returns

A vector containing instances of Run corresponding to all entered workouts between the start and end dates specified.

Definition at line 146 of file Run.java.

```
                                                                                 {
        Vector<Run> runs = new Vector<>();
        int rID;
        Vector<Integer> rIDs = dbManager.getRuns(user.getID(), startDate, endDate);

        if (rIDs != null) {
            Iterator<Integer> runIDIter = rIDs.iterator();
            while (runIDIter.hasNext()) {
                rID = runIDIter.next();
                runs.add(new Run(dbManager, rID));
            }
            return runs;
        }
        else {
            System.err.println("DBManager.getRuns() returned null.");
            return null;
        }
    }
```

### 7.7.3.4 newRunDataPoint()

```
static void com.activitytracker.Run.newRunDataPoint (
             final DBManager dbManager,
             final User user,
             final float duration,
             final Date date,
             final float distance,
             final float altitude )  [static]
```

Adds a new workout to the database or updates an existing workout with new information that the user imported from the log file.

If (*duration*, *distance*, *altitude*) passed to this method is (0, 0, 0) then the intended assumption is that this is the beginning of a new workout. As such, this input will cause a new row to be added to the Runs table in the database and the user's last run ID attribute will be updated accordingly. If the input is non-(0, 0, 0), then three things take place:

1. The *duration* in the database is overwritten by the *duration* provided as input;
2. The *distance* in the database is overwritten by the *distance* provided as input; and
3. Existing values for *altitude_ascended* and *altitude_descended* are retrieved from the database, their difference is compared to the current relative altitude, and depending whether this difference is positive or negative, the appropriate field in the database is updated to reflect the change.

Parameters

| | |
|---|---|
| *dbManager* | Database connection with with the method interacts. |
| *user* | A User object corresponding to the use whose run is being added to the database. |
| *duration* | The length of time in seconds that the user's run lasted. |
| *date* | The date the run occurred. |
| *distance* | The cumulative distance (in metres) that the user ran as of the current time passed to the method. |
| *altitude* | The relative current altitude (in metres) of the user at the time point being entered. Used to compute cumulative altitude ascended and descended throughout the run. |

Definition at line 93 of file Run.java.

```
                                                                                                    {
        int userID = user.getID();
        int rID;
        float altitude_ascended;
        float altitude_descended;

         if (duration == 0f && distance == 0f && altitude == 0f) {
            altitude_ascended = 0f;
            altitude_descended = 0f;
            rID = dbManager.newRun(
                    userID,
                    date,
                    duration,
                    distance,
                    altitude_ascended,
                    altitude_descended
            );
            user.setLastRID(rID);
            System.err.println("Run " + Integer.toString(rID) + " added to database.");
        } else {
            rID = user.getLastRID();
            if (dbManager.runExists(rID)) {
                altitude_ascended = dbManager.
      getRunFloatAttribute(RunAttribute.ALTITUDE_ASCENDED, rID);
```

```
              altitude_descended = dbManager.getRunFloatAttribute(RunAttribute.ALTITUDE_DESCENDED, rID);

              if (altitude < 0)
                  altitude_descended += -1*altitude;
              else
                  altitude_ascended += altitude;

              dbManager.setRun(rID, duration, distance, altitude_ascended, altitude_descended);
              System.err.println("Run " + Integer.toString(rID) + " exists in the database; updating...");
          } else {
              System.err.println("Run table and User table are inconsistent. No changes made.");
          }
      }
  }
```

### 7.7.4 Member Data Documentation

#### 7.7.4.1 altitude_ascended

`float com.activitytracker.Run.altitude_ascended [package]`

The altitude (in metres) that the user climed throughout the run.

Definition at line 41 of file Run.java.

#### 7.7.4.2 altitude_descended

`float com.activitytracker.Run.altitude_descended [package]`

The altitude (in metres) that the user descended throughout their run.

Definition at line 45 of file Run.java.

#### 7.7.4.3 caloriesBurned

```
long com.activitytracker.Run.caloriesBurned = 0  [package]
```

The number of calories that the user burned throughout their run.

Currently this is not being used; it is for future features.

Definition at line 51 of file Run.java.

#### 7.7.4.4 date

```
Date com.activitytracker.Run.date  [package]
```

The date the run occurred.

Definition at line 25 of file Run.java.

#### 7.7.4.5 dbManager

```
DBManager com.activitytracker.Run.dbManager  [package]
```

The run's connection to the database. This is used to add data points and retrieve workout metadata.

Definition at line 29 of file Run.java.

#### 7.7.4.6 distance

```
float com.activitytracker.Run.distance  [package]
```

The distance (in metres) that the user ran.

Definition at line 37 of file Run.java.

#### 7.7.4.7 duration

`float com.activitytracker.Run.duration [package]`

The length of the run in seconds.

Definition at line 33 of file Run.java.

#### 7.7.4.8 id

`int com.activitytracker.Run.id [package]`

The run's unique ID.

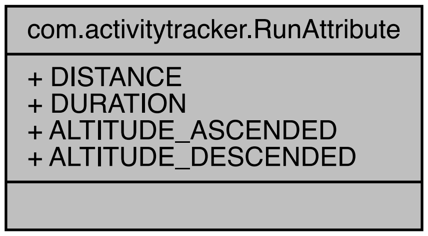
Definition at line 21 of file Run.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/Run.java

## 7.8 com.activitytracker.RunAttribute Enum Reference

Collaboration diagram for com.activitytracker.RunAttribute:



## Public Attributes

- DISTANCE
- DURATION
- ALTITUDE_ASCENDED
- ALTITUDE_DESCENDED

## 7.8.1 Detailed Description

This enumeration type is used to specify the behaviour of generalized methods, particularly in the DBManager class.

Definition at line 6 of file RunAttribute.java.

## 7.8.2 Member Data Documentation

### 7.8.2.1 ALTITUDE_ASCENDED

```
com.activitytracker.RunAttribute.ALTITUDE_ASCENDED
```

The cumulative altitude (in metres) that the user has climbed throughout their run.

Used in DBManager::getRunFloatAttribute to specify that ascended altitude should be returned.

Definition at line 24 of file RunAttribute.java.

### 7.8.2.2 ALTITUDE_DESCENDED

```
com.activitytracker.RunAttribute.ALTITUDE_DESCENDED
```

The cumulative altitude (in metres) that the user has descended throughout their run.

Used in DBManager::getRunFloatAttribute to specify that descended altitude should be returned.

Definition at line 30 of file RunAttribute.java.

#### 7.8.2.3 DISTANCE

`com.activitytracker.RunAttribute.DISTANCE`

The cumulative distance the user has run (in metres).

Used in DBManager::getRunFloatAttribute to specify that distance should be returned.

Definition at line 12 of file RunAttribute.java.

#### 7.8.2.4 DURATION

`com.activitytracker.RunAttribute.DURATION`

The duration of the user's run (in seconds).

Used in DBManager::getRunFloatAttribute to specify that duration should be returned.

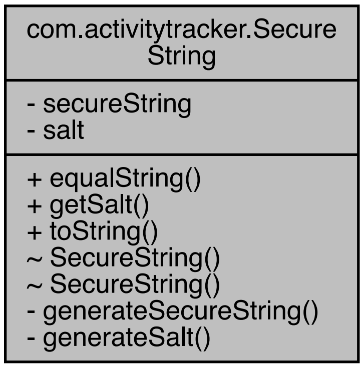
Definition at line 18 of file RunAttribute.java.

The documentation for this enum was generated from the following file:

- app/src/com/activitytracker/RunAttribute.java

## 7.9 com.activitytracker.SecureString Class Reference

Collaboration diagram for com.activitytracker.SecureString:



### Public Member Functions

- boolean equalString (final String other)
- byte [ ] getSalt ()
- String toString ()

### Package Functions

- SecureString (final String plaintext)
- SecureString (final String plaintext, final byte[ ] salt)

### Private Member Functions

- String generateSecureString (final String strToSecure, final byte[ ] salt)

### Static Private Member Functions

- static byte [ ] generateSalt () throws NoSuchAlgorithmException

### Private Attributes

- String secureString
- byte [ ] salt

## 7.9.1 Detailed Description

This class is used to securely store sensitive string-like information such as user passwords.

Definition at line 10 of file SecureString.java.

## 7.9.2 Constructor & Destructor Documentation

#### 7.9.2.1 SecureString() [1/2]

```
com.activitytracker.SecureString.SecureString (
            final String plaintext ) [package]
```

The SecureString() constructor takes as an argument a plain text string, encrypts it, and stores the encrypted string in the variable SecureString::secureString.

Salt is generated using SecureString::generateSalt().

Parameters

| | |
|---|---|
| *plaintext* | The string to be encrypted. May contain sensitive information. |

Definition at line 29 of file SecureString.java.

```
                                         {

          try {
              this.salt = generateSalt();
          }
          catch (final NoSuchAlgorithmException e) {
              System.err.println(e.getMessage());
          }
          this.secureString = generateSecureString(plaintext, this.
      salt);

      }
```

### 7.9.2.2 SecureString() [2/2]

```
com.activitytracker.SecureString.SecureString (
            final String plaintext,
            final byte [] salt )  [package]
```

The SecureString() constructor takes as an argument a plain text string and a previously-generated salt, encrypts the plain text string with the provided salt, and stores the encrypted string in the variable SecureString::secureString.

Parameters

| | |
|---|---|
| *plaintext* | The string to be encrypted. May contain sensitive information. |
| *salt* | Salt that is used to encrypt *plaintext*. This parameter is used whenever we wish to encrypt using a previously-generated salt for the purpose of encrypted string comparison. |

Definition at line 50 of file SecureString.java.

```
                                                              {

          this.salt = salt;
          this.secureString = generateSecureString(plaintext,
      salt);

      }
```

### 7.9.3 Member Function Documentation

#### 7.9.3.1 equalString()

```
boolean com.activitytracker.SecureString.equalString (
          final String other )
```

Compares the secure string to the *other* parameter for equality.

This method will likely be used to authenticate a user from a password hash existing in the database.

Parameters

| | |
|---|---|
| *other* | A (previously encrypted) string with with we compare SecureString::secureString. |

Returns

This method returns True if the hashes of both strings are the same, and False otherwise.

Definition at line 66 of file SecureString.java.

```
                                                {

        return this.secureString.equals(other);

    }
```

#### 7.9.3.2 generateSalt()

```
static byte [] com.activitytracker.SecureString.generateSalt ( ) throws No←
SuchAlgorithmException [static], [private]
```

This method generates salt for encryption of a plain text string.

Returns

Returns a byte array of length sixteen (16) containing the encryption salt.

Exceptions

| | |
|---|---|
| *NoSuchAlgorithmException* | Required as *SecureRandom.getInstace()* may throw this exception and we would like the invoking method to decide how to handle it rather than catching and dismissing it here. |

Definition at line 83 of file SecureString.java.

```
                                                                             {
           SecureRandom sr = SecureRandom.getInstance("SHA1PRNG");
           byte[] salt = new byte[16];
           sr.nextBytes(salt);
           return salt;
       }
```

#### 7.9.3.3 generateSecureString()

```
String com.activitytracker.SecureString.generateSecureString (
             final String strToSecure,
             final byte [] salt ) [private]
```

Encrypt string and return secure version.

Due to the importance of securely storing passwords, a "tried and true" method for encrypting passwords found at this link has been used.

Parameters

| | |
|---|---|
| *strToSecure* | The plain text string we wish to encrypt. |
| *salt* | The salt with which we will encrypt *strToSecure*. |

Returns

This private method returns the encrypted string to the SecureString() constructor.

Definition at line 102 of file SecureString.java.

```
                                                                                               {
           String generatedPassword = null;
           try {
               MessageDigest md = MessageDigest.getInstance("SHA-512");
```

```
106             md.update(salt);
107             byte[] strBytes = md.digest(strToSecure.getBytes());
108             StringBuilder sb = new StringBuilder();
109             for (int i = 0; i < strBytes.length; i++) {
110                 sb.append(Integer.toString((strBytes[i] & 0xff) + 0x100, 16).substring(1));
111             }
112             generatedPassword = sb.toString();
113         }
114         catch (final NoSuchAlgorithmException e) {
115             System.err.println(e.getMessage());
116         }
117         return generatedPassword;
118     }
```

#### 7.9.3.4 getSalt()

`byte [] com.activitytracker.SecureString.getSalt ( )`

**Returns**

Returns the byte array-type salt used to encrypt the text given to the object's constructor.

Definition at line 123 of file SecureString.java.

```
123                             {
124         return this.salt;
125     }
```

#### 7.9.3.5 toString()

`String com.activitytracker.SecureString.toString ( )`

Overrided method to return the object as a Java String.

The encrypted string will be returned, though it should be noted for completeness that this is not a full representation of the object since the salt is crucial in arriving at SecureString::secureString being returned.

**Returns**

Returns the encrypted string.

Definition at line 136 of file SecureString.java.

```
136                              {
137         return this.secureString;
138     }
```

### 7.9.4 Member Data Documentation

#### 7.9.4.1 salt

`byte [] com.activitytracker.SecureString.salt [private]`

The salt that was used to encrypt the plain text string.

Definition at line 19 of file SecureString.java.

#### 7.9.4.2 secureString

`String com.activitytracker.SecureString.secureString [private]`

The encrypted string.

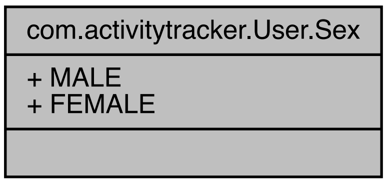
Definition at line 15 of file SecureString.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/SecureString.java

## 7.10 com.activitytracker.User.Sex Enum Reference

Collaboration diagram for com.activitytracker.User.Sex:



## Public Attributes

- MALE
- FEMALE

### 7.10.1 Detailed Description

Used to represent whether the user is male or female.

Definition at line 12 of file User.java.

### 7.10.2 Member Data Documentation

#### 7.10.2.1 FEMALE

```
com.activitytracker.User.Sex.FEMALE
```

Used to represent that the user is female.

Recall from the source code included in DBManager::init() that sex is stored in the database using a data type of BIT(1). If the user is female, we store this in the database by populating this field with a *0*.

Definition at line 26 of file User.java.

#### 7.10.2.2 MALE

```
com.activitytracker.User.Sex.MALE
```

Used to represent that the user is male.

Recall from the source code included in DBManager::init() that sex is stored in the database using a data type of BIT(1). If the user is female, we store this in the database by populating this field with a *1*.

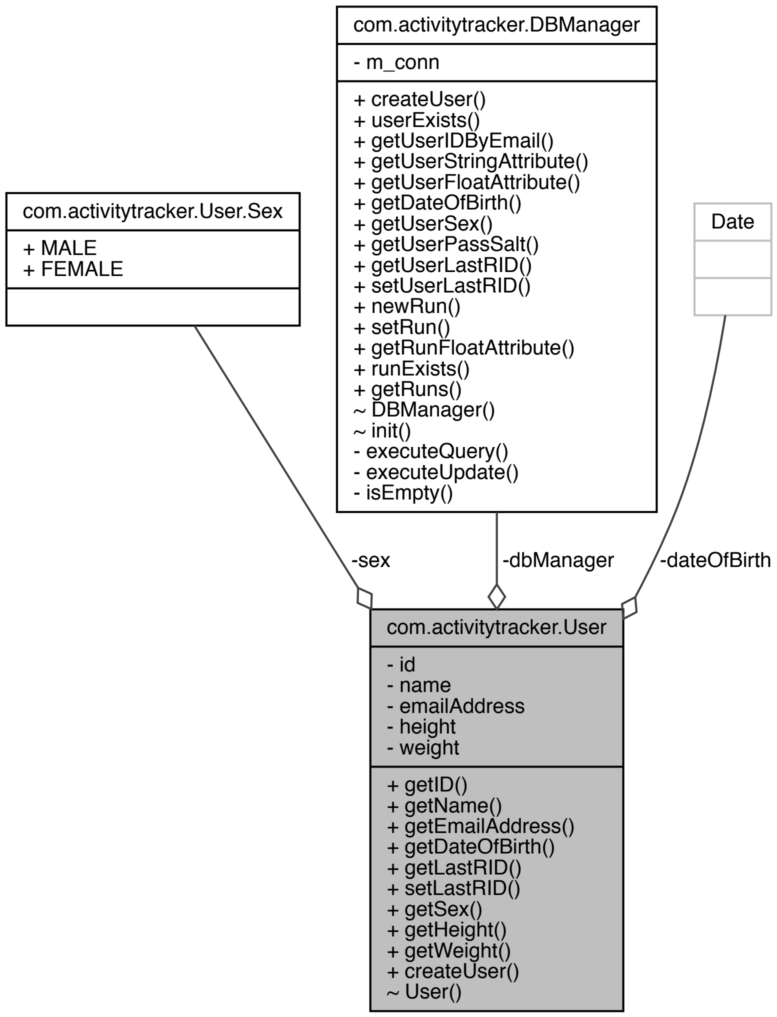
Definition at line 19 of file User.java.

The documentation for this enum was generated from the following file:

- app/src/com/activitytracker/User.java

## 7.11 com.activitytracker.User Class Reference

Collaboration diagram for com.activitytracker.User:



## Classes

- enum Sex

## Public Member Functions

- int getID ()
- String getName ()
- String getEmailAddress ()
- Date getDateOfBirth ()
- int getLastRID ()
- void setLastRID (final int rID)
- Sex getSex ()
- float getHeight ()
- float getWeight ()

## Static Public Member Functions

- static void createUser (final DBManager dbManager, final String name, final String emailAddress, final int DOBYear, final int DOBMonth, final int DOBDay, final User.↩ Sex sex, final float height, final float weight, final String plaintextPassword)

## Package Functions

- User (final DBManager dbManager, final String emailAddress, final String plaintext↩ Password) throws AuthenticationException

## Private Attributes

- int id
- String name
- String emailAddress
- Date dateOfBirth
- Sex sex
- float height
- float weight
- DBManager dbManager = null

### 7.11.1 Detailed Description

Definition at line 8 of file User.java.

### 7.11.2 Constructor & Destructor Documentation

#### 7.11.2.1 User()

```
com.activitytracker.User.User (
             final DBManager dbManager,
             final String emailAddress,
             final String plaintextPassword ) throws AuthenticationException [pack-
age]
```

Definition at line 38 of file User.java.

```
38
                         {
39
40          this.dbManager = dbManager;
41          if (this.dbManager.userExists(emailAddress)) {
42
43              this.id = dbManager.getUserIDByEmail(
      emailAddress);
44
45              String passHash = this.dbManager.getUserStringAttribute(
      UserAttribute.PASSWORD, this.id);
46              byte[] passSalt = this.dbManager.getUserPassSalt(this.id);
47
48              SecureString candidatePassword = new SecureString(plaintextPassword, passSalt);
49
50              if (candidatePassword.equalString(passHash)) {
51
52
53                  this.name = this.dbManager.getUserStringAttribute(
      UserAttribute.NAME, this.id);
54 //                 this.emailAddress = this.dbManager.getEmailAddress(this.id);
55                  this.emailAddress = emailAddress;
56                  this.dateOfBirth = this.dbManager.
      getDateOfBirth(this.id);
57                  this.sex = this.dbManager.getUserSex(this.id);
58                  this.height = this.dbManager.
      getUserFloatAttribute(UserAttribute.HEIGHT, this.id);
59                  this.weight = this.dbManager.
      getUserFloatAttribute(UserAttribute.WEIGHT, this.id);
60
61                  System.out.println("Authentication succeeded for " + this.name);
62
63              }
64              else {
65
66                  throw new AuthenticationException("Incorrect password.");
67
68              }
69          }
70          else {
71
72              throw new NoSuchElementException("No such user exists.");
73
74          }
75
76      }
```

## 7.11.3 Member Function Documentation

### 7.11.3.1 createUser()

```
static void com.activitytracker.User.createUser (
          final DBManager dbManager,
          final String name,
          final String emailAddress,
          final int DOBYear,
          final int DOBMonth,
          final int DOBDay,
          final User.Sex sex,
          final float height,
          final float weight,
          final String plaintextPassword ) [static]
```

Definition at line 78 of file User.java.

```
                                                                          {

        SecureString securePassword = new SecureString(plaintextPassword);


        dbManager.createUser(
                name,
                emailAddress,
                DOBYear,
                DOBMonth,
                DOBDay,
                sex,
                height,
                weight,
                securePassword
        );

    }
```

### 7.11.3.2 getDateOfBirth()

```
Date com.activitytracker.User.getDateOfBirth ( )
```

Definition at line 111 of file User.java.

```
                              {
        return this.dateOfBirth;
    }
```

#### 7.11.3.3 getEmailAddress()

`String com.activitytracker.User.getEmailAddress ( )`

Definition at line 107 of file User.java.

```
                                    {
        return this.emailAddress;
    }
```

#### 7.11.3.4 getHeight()

`float com.activitytracker.User.getHeight ( )`

Definition at line 123 of file User.java.

```
                              {
        return this.height;
    }
```

#### 7.11.3.5 getID()

`int com.activitytracker.User.getID ( )`

Definition at line 99 of file User.java.

```
                          {
        return this.id;
    }
```

#### 7.11.3.6 getLastRID()

`int com.activitytracker.User.getLastRID ( )`

Definition at line 115 of file User.java.

```
{ return this.dbManager.getUserLastRID(this.id); }
```

#### 7.11.3.7 getName()

`String com.activitytracker.User.getName ( )`

Definition at line 103 of file User.java.

```
                             {
        return this.name;
    }
```

#### 7.11.3.8 getSex()

`Sex com.activitytracker.User.getSex ( )`

Definition at line 119 of file User.java.

```
                         {
        return this.sex;
    }
```

#### 7.11.3.9 getWeight()

`float com.activitytracker.User.getWeight ( )`

Definition at line 127 of file User.java.

```
                              {
        return this.weight;
    }
```

#### 7.11.3.10 setLastRID()

```
void com.activitytracker.User.setLastRID (
          final int rID )
```

Definition at line 117 of file User.java.

```
{ this.dbManager.setUserLastRID(this.id, rID); }
```

### 7.11.4 Member Data Documentation

#### 7.11.4.1 dateOfBirth

```
Date com.activitytracker.User.dateOfBirth [private]
```

Definition at line 32 of file User.java.

#### 7.11.4.2 dbManager

```
DBManager com.activitytracker.User.dbManager = null [private]
```

Definition at line 36 of file User.java.

#### 7.11.4.3 emailAddress

```
String com.activitytracker.User.emailAddress [private]
```

Definition at line 31 of file User.java.

#### 7.11.4.4 height

`float com.activitytracker.User.height [private]`

Definition at line 34 of file User.java.

#### 7.11.4.5 id

`int com.activitytracker.User.id [private]`

Definition at line 29 of file User.java.

#### 7.11.4.6 name

`String com.activitytracker.User.name [private]`

Definition at line 30 of file User.java.

#### 7.11.4.7 sex

`Sex com.activitytracker.User.sex [private]`

Definition at line 33 of file User.java.

#### 7.11.4.8 weight

`float com.activitytracker.User.weight [private]`

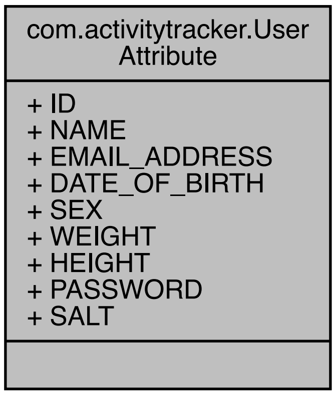
Definition at line 35 of file User.java.

The documentation for this class was generated from the following file:

- app/src/com/activitytracker/User.java

## 7.12 com.activitytracker.UserAttribute Enum Reference

Collaboration diagram for com.activitytracker.UserAttribute:



### Public Attributes

- ID
- NAME
- EMAIL_ADDRESS
- DATE_OF_BIRTH
- SEX
- WEIGHT
- HEIGHT
- PASSWORD
- SALT

### 7.12.1 Detailed Description

This enumeration type is used to specify the behaviour of generalized methods, particularly in the DBManager class.

Definition at line 6 of file UserAttribute.java.

## 7.12.2 Member Data Documentation

#### 7.12.2.1 DATE_OF_BIRTH

`com.activitytracker.UserAttribute.DATE_OF_BIRTH`

Currently not used as no generalized method retrieves the user's DOB.

Definition at line 26 of file UserAttribute.java.

#### 7.12.2.2 EMAIL_ADDRESS

`com.activitytracker.UserAttribute.EMAIL_ADDRESS`

The user's email address.

Used in DBManager::getUserStringAttribute to specify that the user's email address should be returned.

Definition at line 22 of file UserAttribute.java.

#### 7.12.2.3 HEIGHT

`com.activitytracker.UserAttribute.HEIGHT`

The user's height (in metres).

Used in DBManager::getUserFloatAttribute to specify that the user's email height should be returned.

Definition at line 42 of file UserAttribute.java.

#### 7.12.2.4 ID

`com.activitytracker.UserAttribute.ID`

Currently not used as no generalized method retrieves the user's ID.

Definition at line 10 of file UserAttribute.java.

#### 7.12.2.5 NAME

`com.activitytracker.UserAttribute.NAME`

The user's full name.

Used in DBManager::getUserStringAttribute to specify that the user's name should be returned.

Definition at line 16 of file UserAttribute.java.

#### 7.12.2.6 PASSWORD

`com.activitytracker.UserAttribute.PASSWORD`

The user's encrypted password hash.

Used in DBManager::getUserStringAttribute to specify that the user's password hash should be returned.

Definition at line 48 of file UserAttribute.java.

#### 7.12.2.7 SALT

`com.activitytracker.UserAttribute.SALT`

Currently not used as no generalized method retrieves the user's password encryption salt.

Definition at line 52 of file UserAttribute.java.

#### 7.12.2.8 SEX

`com.activitytracker.UserAttribute.SEX`

Currently not used as no generalized method retrieves the user's sex.

Definition at line 30 of file UserAttribute.java.

#### 7.12.2.9 WEIGHT

`com.activitytracker.UserAttribute.WEIGHT`

The user's weight (in kilograms).

Used in DBManager::getUserFloatAttribute to specify that the user's email weight should be returned.

Definition at line 36 of file UserAttribute.java.

The documentation for this enum was generated from the following file:

- app/src/com/activitytracker/UserAttribute.java

# Chapter 8

# File Documentation

## 8.1 app/src/com/activitytracker/ActivityTracker.java File Reference

### Classes

- class com.activitytracker.ActivityTracker

### Packages

- package com.activitytracker

## 8.2 app/src/com/activitytracker/CreateUserWindow.java File Reference

### Classes

- class com.activitytracker.CreateUserWindow

### Packages

- package com.activitytracker

## 8.3 app/src/com/activitytracker/DBManager.java File Reference

### Classes

- class com.activitytracker.DBManager

### Packages

- package com.activitytracker

## 8.4 app/src/com/activitytracker/Iteration3Test.java File Reference

### Classes

- class com.activitytracker.Iteration3Test

### Packages

- package com.activitytracker

## 8.5 app/src/com/activitytracker/LoginWindow.java File Reference

### Classes

- class com.activitytracker.LoginWindow

### Packages

- package com.activitytracker

## 8.6 app/src/com/activitytracker/MainWindow.java File Reference

### Classes

- class com.activitytracker.MainWindow

### Packages

- package com.activitytracker

## 8.7 app/src/com/activitytracker/Run.java File Reference

### Classes

- class com.activitytracker.Run

### Packages

- package com.activitytracker

## 8.8 app/src/com/activitytracker/RunAttribute.java File Reference

### Classes

- enum com.activitytracker.RunAttribute

### Packages

- package com.activitytracker

## 8.9 app/src/com/activitytracker/SecureString.java File Reference

### Classes

- class com.activitytracker.SecureString

### Packages

- package com.activitytracker

## 8.10 app/src/com/activitytracker/User.java File Reference

### Classes

- class com.activitytracker.User
- enum com.activitytracker.User.Sex

### Packages

- package com.activitytracker

## 8.11 app/src/com/activitytracker/UserAttribute.java File Reference

### Classes

- enum com.activitytracker.UserAttribute

### Packages

- package com.activitytracker

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