Project Report

On

Android Step Counter App

for

Bachelor of Technology
in
Computer Science & Engineering

Submitted By

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Above all, we bow before The Almighty for his immense blessings throughout the life.

Date: 30-11-2020   Raghav Rastogi

DECLARATION

I, Raghav Rastogi (Reg No RA1811003030184),hereby declare that this project is my own work and that it has not been displayed and will not be displayed to any other institute/university for the award of any kind of degree or diploma.

Abstract

These days everyone is very keen and very particular when it comes to health and health is directly proportional to our diet and exercise. So I am presenting to you a system which takes care of your health by monitoring three different parameters of your actions step counter, sleep intake and water intake. While registering into the system, you need to enter your age, height, weight and gender to determine BMI and calculate the sleep and water intake per day and the Step Counter uses the accelerometer sensor to get the input for counting the steps. While in water and sleep the system generates the amount of sleep and water the user to have, also the user can edit his physical attributes to as an when they are changed.

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1.1 Step Tracking

Step counter, being an active area of human daily physical activity, is an essential role in human activity determination research. As the current smartphones come with many different sensors and powerful processing capabilities, the step counting using built-in sensors in a smartphone is increasingly becoming a vital factor among many researchers. However, the step counting with a smartphone has still challenging due to many different walking behaviors and mobile phone positions. In this study, we introduce a more reliable step counter"s technique using Accelerometer sensor in a smart phone.

1.2 Sleep And Water Intake

This calculator helps you determine approximately the amount of water you must drink each day to avoid dehydration. Remember, this is only an estimate. The actual amount one needs depends on many factors like exercise, illness and fluid content in dietary intake.

Scientific research makes clear that sleep is essential at any age. Sleep powers the mind, restores the body, and fortifies virtually every system in the body.

2 Motivation and Need for this work

The motivation for this work came from the particular fact that there are many people who have health related problems and the proposed system might be helpful to solve them.And secondary there are over 89% devices which use Android so such a system will run smoothly.

3.1 Overview of Work

Created the following modules:
Modules:

- **Registration:** The user has to register into the system with his physical attributes and other details.

- **Login:** The user has to sign in and will be signed in till he signs out.

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- **Profile:** The user can update his physical attributes in the profile tab.

- **Step Counter**: The steps are counted in the background and shown in the form of line graph of the entire month.

- **Sleep Intake:** The system tells the user about his daily Sleep intake considering his physical attributes which can be changed.

- **Water Intake:** The system tells the user about his daily Water intake considering his physical attributes which can be changed.

3.2 Methodology

As the App is Launched,the Login Screen is displayed.For first time users,click on SignUp.The user is directed to Registration page.On entering his or her physical attributes like age,weight,height,gender and username,password.This data is saved in an internal SQLite Server.Now he is redirected to Login page and after authenticating his credentials he is directed to a page which has steps,water intake and sleep intake tabs. The user can now determine his/her sleep and water intake which are calculated using BMI and Hydration Calculators.Also he can put the phone in his pocket and walk.The steps on the counter will increase and the progress bar will increase.The total steps taken in a day are determined and the user can also reset them manually.Also he/she can change his/her physical attributes as and when required. I have implemented Java classes like Date,EditText,Sqlite for backend,XML for designing the screens and Shared Preferences for storing the count of steps.

4) Accuracy of the Tracker

The accuracy of the proposed system is 93% calculated on the bases of 5 different observations.The accuracy might vary from device to device.

Observations:

Actual steps walked	Count on App
15	14
23	21
48	49
68	56
152	146

Total actual steps walked=306
Mean of actual steps observation=306/5=61.2
Total count on App=286
Mean of count=57.2
So the accuracy is:57.2/61.2 *100=93.46%
(*Accuracy may vary from device to device)

5) Hardware Requirements

Processor-i3 or above
Hard-Disk-5Gb
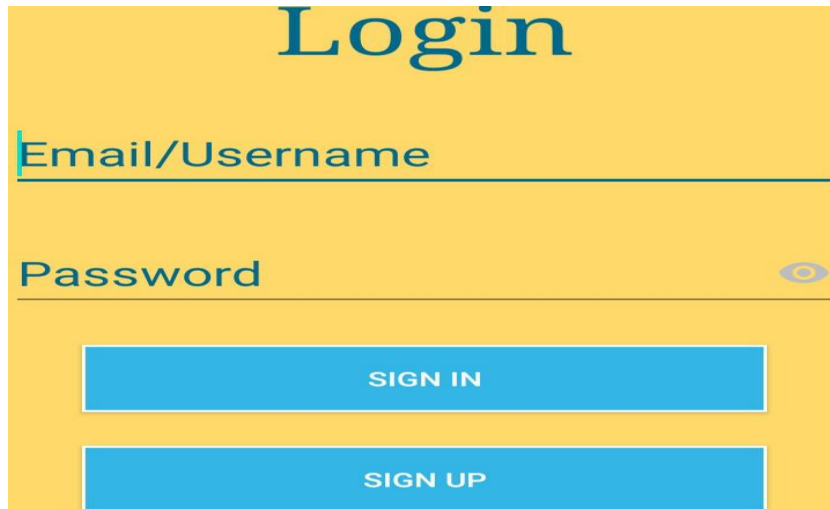Memory-1Gb
Android Phone with Kitkat or Higher

6) Software Requirement
Operating System:Windows 8 or above
Android Studio (Version 2.1 or above)
JDK-8 or above.

7) Refrences:
https://developer.android.com/
https://nevonprojects.com/
https://www.sqlitetutorial.net/
https://www.javatpoint.com

8)GUI Screens

Age
_____

Height(in cms)
_____

Weight(in kg)
_____

Gender   ◯ Male   ◯ Female

Phone Number
_____

Email-ID/Username
_____

Password   👁
_____

Comform Password   👁
_____

SUBMIT

Age　　　　Height(cm)　　　Weight(kg)

20　　　　　172　　　　　80.0

DETERMINE　　　　　EDIT

8 Hrs

Daily Intake Of Sleep

STEPS	WATER	SLEEP

Age	Height(cm)	Weight(kg)
20	172	80.0

DETERMINE **EDIT**
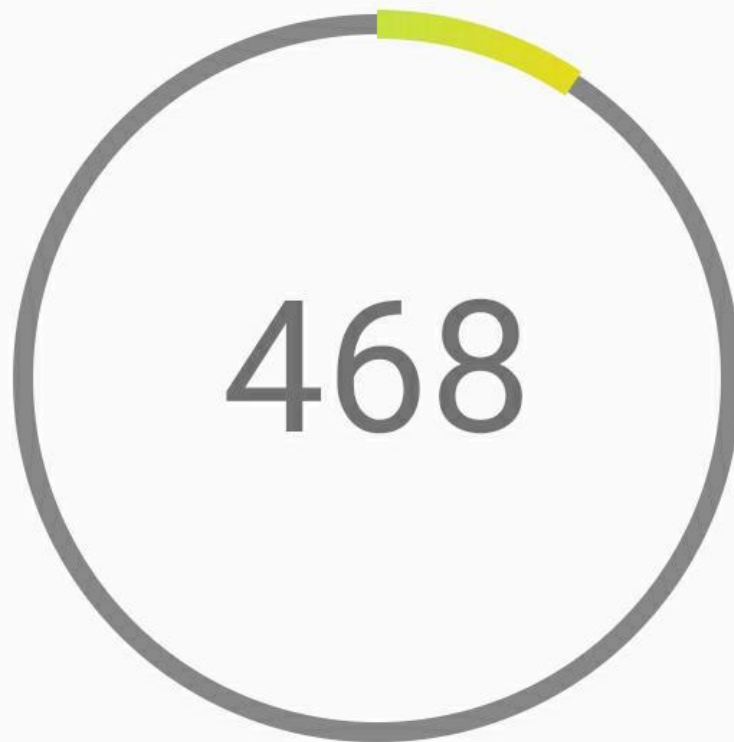
3.5 Litres

Daily Intake of water

STEPS　　　　WATER　　　　SLEEP

Today's Count

468

RESET

9)CODING:

MainActivity.java

```java
package android.example.stepcounter;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.widget.Toolbar;
import java.util.Calendar;
import java.util.Date;
import java.util.TimeZone;
public class MainActivity extends AppCompatActivity {
    EditText name;
    EditText Password;
    Button SignIn;
    Button SignUp;
    SQLiteDatabase db;
    Date date;

String username,password;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        name = findViewById(R.id.editText1);
        Password = findViewById(R.id.editText2);
        SignIn = findViewById(R.id.signin);
        SignUp = findViewById(R.id.signup);

      db=openOrCreateDatabase("Biodata",MODE_PRIVATE,null);
        //create table(create query)
        db.execSQL("create table IF NOT EXISTS form(id int PRIMARY KEY,age
varchar(20),height varchar(20),weight varchar(20),gender varchar(20),pno
varchar(20),mail varchar(20),pass varchar(20))");
        SignIn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {

                sendTOtabs();
            }
        });
        SignUp.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent intent = new Intent(MainActivity.this, registration.class);
                startActivity(intent);
            }
```

```java
            });
        }
    private void sendTOtabs() {
        username=name.getText().toString().trim();
        password=Password.getText().toString().trim();
        //login query
        Cursor cursor=db.rawQuery("select mail,pass from form where mail='"+username+"'
and pass='"+password+"'",null);
        if (cursor.moveToNext())
        {
            Intent obj =new Intent(MainActivity.this,tabs.class);
            startActivity(obj);
            cursor.close();
        }
        else
            Toast.makeText(getApplicationContext(),"Incorrect username or
Password",Toast.LENGTH_LONG).show();
            }

}
```

Registration.java

```java
package android.example.stepcounter;

import androidx.annotation.NonNull;
import androidx.annotation.RequiresApi;
import androidx.appcompat.app.ActionBar;
import androidx.appcompat.app.AppCompatActivity;

import java.util.UUID;
import android.app.Activity;
import android.content.Intent;
import android.database.sqlite.SQLiteDatabase;
import android.os.Build;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Toast;
import android.widget.Toolbar;

public class registration extends AppCompatActivity {

    EditText age,height,weight,pno,mail,pass,cnfpass;
    RadioGroup radioGroup;
    RadioButton m,f;
    Button submit;
    SQLiteDatabase db;
    String age1,height1,weight1,mail1,pass1,cnfpass1;
    String pno1;
    String gen;
    @Override
```

```java
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_registration);
        ActionBar actionBar= getSupportActionBar();
        actionBar.setTitle("Registration");
        age=findViewById(R.id.age);
        height=findViewById(R.id.height);
        weight=findViewById(R.id.weight);
        mail=findViewById(R.id.mail);
        pno=findViewById(R.id.pno);
        pass=findViewById(R.id.pass);
        cnfpass=findViewById(R.id.confpass);
        radioGroup=findViewById(R.id.gender);
        m=findViewById(R.id.male);
        f=findViewById(R.id.female);
        submit=findViewById(R.id.submit);
        db=openOrCreateDatabase("Biodata",MODE_PRIVATE,null);

        submit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                assignData();
            }
        });


    }

    private void assignData() {
        //get fields from edittexts
        UUID id=UUID.randomUUID();
         age1=age.getText().toString().trim();
         height1=height.getText().toString().trim();
         weight1=weight.getText().toString().trim();
         mail1=mail.getText().toString().trim();
         pass1=pass.getText().toString().trim();
         cnfpass1=cnfpass.getText().toString().trim();
         pno1=pno.toString().trim();

        if(m.isChecked())
            gen="Male";
        else if(f.isChecked())
            gen="Female";
        if(age1.equals("")||
height1.equals("")||weight1.equals("")||gen.equals("")||pno1.equals("")||mail1.equals("
")||pass1.equals(""))
            Toast.makeText(this,"Enter all the details",Toast.LENGTH_LONG).show();
      else   if(!pass1.equals(cnfpass1))
            Toast.makeText(this,"Password does not match",Toast.LENGTH_LONG).show();
        else if(!age1.matches("[0-9]+"))
            Toast.makeText(this,"Enter a valid age",Toast.LENGTH_LONG).show();
        else if (!height1.matches("[0-9]+"))
            Toast.makeText(this,"Enter a valid height",Toast.LENGTH_LONG).show();
     //  else  if(!weight1.matches("[0-9]+.[0-9]+"))
        else  if(!weight1.matches("^\\d+?\\.\\d+?$"))
            Toast.makeText(this,"Enter a valid weight",Toast.LENGTH_LONG).show();
```

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```java
        else
        {
            //insert query
db.execSQL("insert into form
values('"+id+","+age1+"','"+height1+"','"+weight1+"','"+gen+"','"+pno1+"','"+mail1+"','
"+pass1+"')");
Intent intent=new Intent(registration.this,MainActivity.class);
startActivity(intent);


        }

    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.menuback,menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        int id=item.getItemId();
        backTologinPage();
        return super.onOptionsItemSelected(item);
    }

    private void backTologinPage() {
        Intent intent=new Intent(registration.this,MainActivity.class);
        startActivity(intent);
    }
}
```

FragSleep.java

```java
package android.example.stepcounter;

import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;


import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;

public class FragSleep extends Fragment {
    SQLiteDatabase db1;
    private TextView textView33,textView44,textView55;
    private EditText age2,height2,weight2;
    private String age11,height11,weight11;
    private Button determine1,edit1;
```

```java
    private TextView dailyIntake2,hours;
    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup
container, @Nullable Bundle savedInstanceState) {
        return inflater.inflate(R.layout.frag_sleep, container, false);
    }


    @Override
    public void onViewCreated(@NonNull View view, @Nullable Bundle savedInstanceState)
{
        super.onViewCreated(view, savedInstanceState);
        textView33=(TextView)getActivity().findViewById(R.id.textView3);
        textView44=(TextView)getActivity().findViewById(R.id.textView4);
        textView55=(TextView)getActivity().findViewById(R.id.textView5);
        age2=(EditText) getActivity().findViewById(R.id.ageA);
        weight2=(EditText)getActivity().findViewById(R.id.weightA);
        height2=(EditText)getActivity().findViewById(R.id.heightA);
        determine1=(Button)getActivity().findViewById(R.id.determine2);
        dailyIntake2=getActivity().findViewById(R.id.dailyIntake2);
        hours=getActivity().findViewById(R.id.hours);
        edit1=(Button)getActivity().findViewById(R.id.edit2);
        db1=getActivity().openOrCreateDatabase("Biodata", Context.MODE_PRIVATE,null);
        Cursor cursor1=db1.rawQuery("Select *from form",null);
        while (cursor1.moveToNext()) {
            age11 = cursor1.getString(1);
            height11 = cursor1.getString(2);
            weight11 = cursor1.getString(3);
        }
        cursor1.close();
        age2.setText( "   " +age11.trim());
        height2.setText("  " +height11.trim());
        weight2.setText("  "+weight11.trim());
        age2.setEnabled(false);
        height2.setEnabled(false);
        weight2.setEnabled(false);
        dailyIntake2.setVisibility(View.INVISIBLE);
        hours.setVisibility(View.INVISIBLE);

        edit1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                age2.setEnabled(true);
                height2.setEnabled(true);
                weight2.setEnabled(true);
            }
        });
        determine1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                calcSleepIntake();
            }
        });
    }
    private void calcSleepIntake()
    {
        age2.setEnabled(false);
        height2.setEnabled(false);
        weight2.setEnabled(false);
        String getAGE=age2.getText().toString().trim();
```

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```java
        int heightH=Integer.parseInt(height2.getText().toString());
        int weightW=Integer.parseInt(weight2.getText().toString());
        int bmi=weightW/(heightH*heightH);
        int sleepIntake = 0;
    //  bmi=Integer.parseInt(getAGE);
        if(bmi<=1)
            sleepIntake=14;
        else if(bmi>1&&bmi<=2)
            sleepIntake=13;
        else if(bmi>2&&bmi<=3)
            sleepIntake=12;
        else if(bmi>3&&bmi<=5)
            sleepIntake=11;
        else if(bmi>5&&bmi<=13)
            sleepIntake=10;
        else if(bmi>13&&bmi<17)
            sleepIntake=9;
        else if(bmi>17&&bmi<=25)
            sleepIntake=8;
        else if(bmi>25&&bmi<=64)
            sleepIntake=7;
        else if(bmi>64)
            sleepIntake=7;
  hours.setText(sleepIntake+" Hrs");
        hours.setVisibility(View.VISIBLE);
  dailyIntake2.setVisibility(View.VISIBLE);

    }

}
```

FragWater.java

```java
package android.example.stepcounter;

import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import java.util.UUID;

import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;

public class FragWater extends Fragment {
    private SQLiteDatabase db;
    private TextView textView3,textView4,textView5;
    private EditText age,height,weight;
    private String age1,height1,weight1;
    private Button determine,edit;
    private TextView litres,dailyIntake;
```

```java
    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup
container, @Nullable Bundle savedInstanceState) {
        return inflater.inflate(R.layout.frag_water, container, false);
    }

    @Override
    public void onViewCreated(@NonNull View view, @Nullable Bundle savedInstanceState)
{
        super.onViewCreated(view, savedInstanceState);
        textView3 = (TextView) getActivity().findViewById(R.id.a);
        textView4 = (TextView) getActivity().findViewById(R.id.w);
        textView5 = (TextView) getActivity().findViewById(R.id.h);
        litres= (TextView)getActivity().findViewById(R.id.litres);
        dailyIntake=(TextView)getActivity().findViewById(R.id.dailyIntake);

        age = (EditText) getActivity().findViewById(R.id.ageB);
        weight = (EditText) getActivity().findViewById(R.id.weightB);
        height = (EditText) getActivity().findViewById(R.id.heightB);
        determine = (Button) getActivity().findViewById(R.id.determine);
        edit = (Button) getActivity().findViewById(R.id.edit);
        db = getActivity().openOrCreateDatabase("Biodata", Context.MODE_PRIVATE, null);
        Cursor cursor = db.rawQuery("Select *from form", null);
        while (cursor.moveToNext()) {
            age1 = cursor.getString(1);
            height1 = cursor.getString(2);
            weight1 = cursor.getString(3);
        }

        cursor.close();
        age.setText("   " + age1.trim());
        height.setText("   " + height1.trim());
        weight.setText("   " + weight1.trim());
        age.setEnabled(false);
        height.setEnabled(false);
        weight.setEnabled(false);
        litres.setVisibility(View.INVISIBLE);
        dailyIntake.setVisibility(View.INVISIBLE);

        edit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                age.setEnabled(true);
                height.setEnabled(true);
                weight.setEnabled(true);
            }
        });
        determine.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                calcWaterIntake();
            }
        });


    }
```

```java
    private void calcWaterIntake()
    {
        age.setEnabled(false);
        height.setEnabled(false);
        weight.setEnabled(false);
String acw=weight.getText().toString().trim();
float acwV=Float.parseFloat(acw);
double waterIntake_W=0;
if(acwV<=30)
    waterIntake_W=1.0;
else if(acwV>30&&acwV<=45)
    waterIntake_W=1.5;
else if(acwV>45&&acwV<=49.9)
    waterIntake_W=1.98;
else if(acwV>49.9&&acwV<=54.9)
    waterIntake_W=2.1;
else if (acwV>54.9&&acwV<=58.9)
waterIntake_W=2.5;
else if (acwV>58.9&&acwV<=63.5)
    waterIntake_W=2.7;
else if(acwV>63.5&&acwV<=68.9)
    waterIntake_W=2.9;
else if(acwV>68.9&&acwV<=72.57)
    waterIntake_W=3.1;
else if (acwV>72.57&&acwV<=77)
    waterIntake_W=3.3;
else if(acwV>77&&acwV<=81.6)
    waterIntake_W=3.5;
else if(acwV>81.6&&acwV<=86)
    waterIntake_W=3.75;
else if(acwV>86&&acwV<=90.7)
    waterIntake_W=3.9;
else if(acwV>90.7&&acwV<=95.25)
    waterIntake_W=4.1;
else if(acwV>95.25&&acwV<=99.79)
    waterIntake_W=4.3;
else if(acwV>99.79&&acwV<=104.3)
    waterIntake_W=4.55;
else if(acwV>104.3&&acwV<=108.86)
    waterIntake_W=4.76;
else if (acwV>108.86&&acwV<=115)
    waterIntake_W=4.96;
else if (acwV>115&&acwV<=150)
    waterIntake_W=5;
else if(acwV>150)
    waterIntake_W=6;
else
    Toast.makeText(getActivity(),"Enter Proper Details",Toast.LENGTH_SHORT).show();
litres.setText(waterIntake_W+" Litres");
litres.setVisibility(View.VISIBLE);
dailyIntake.setVisibility(View.VISIBLE);




    }
}
```

FragSteps.java

```java
package android.example.stepcounter;

import android.content.Context;
import android.example.stepcounter.R;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TextView;

import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;
import android.content.SharedPreferences;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;

import android.os.Bundle;
import android.widget.TextView;

import com.mikhaellopez.circularprogressbar.CircularProgressBar;

import java.util.Calendar;
import java.util.Date;
import java.util.TimeZone;

import kotlin.Unit;

import static androidx.core.content.ContextCompat.getSystemService;

public class FragSteps extends Fragment {


    public TextView tv,tv1;
    SensorManager sensorManager;
    private double magni;
    private Integer stepcount = 0;
    Button reset;


    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup
container, @Nullable Bundle savedInstanceState) {
        return inflater.inflate(R.layout.frag_steps, container, false);
    }

    @Override
    public void onViewCreated(@NonNull View view, @Nullable Bundle savedInstanceState)
{
        super.onViewCreated(view, savedInstanceState);
        tv1=(TextView)getActivity().findViewById(R.id.text);
```

```java
        reset=(Button)getActivity().findViewById(R.id.reset) ;
    tv =(TextView)getActivity().findViewById(R.id.tv);
        sensorManager =
(SensorManager)getActivity().getSystemService(Context.SENSOR_SERVICE);
        assert sensorManager != null;
        Sensor sensor = sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER);
        CircularProgressBar circularProgressBar
=getActivity().findViewById(R.id.circularProgressBar);


circularProgressBar.setProgressDirection(CircularProgressBar.ProgressDirection.TO_RIGHT)
;
        // Sensor sensor = sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER);
        circularProgressBar.setOnIndeterminateModeChangeListener(isEnable -> {
            // Do something
            return Unit.INSTANCE;
        });

        circularProgressBar.setOnProgressChangeListener(progress -> {
            // Do something
            return Unit.INSTANCE;
        });

        SensorEventListener obj = new SensorEventListener() {
            @Override
            public void onSensorChanged(SensorEvent sensorEvent) {
                if (sensorEvent != null) {
                    float x_accelerometer = sensorEvent.values[0];
                    float y_accelerometer = sensorEvent.values[1];
                    float z_accelerometer = sensorEvent.values[2];
                    double magnitude = Math.sqrt(x_accelerometer * x_accelerometer +
y_accelerometer * y_accelerometer + z_accelerometer * z_accelerometer);
                    double magniDelta = magnitude - magni;
                    magni = magnitude;
                    if (magniDelta > 6) {
                        stepcount++;
                    }
                    Calendar A= Calendar.getInstance();
                    int a=A.get(Calendar.HOUR_OF_DAY);
                    int b=A.get(Calendar.MINUTE);


                    if(a==0&&b==00)
                        stepcount=0;
                    tv.setText(stepcount.toString());
                    circularProgressBar.setProgressWithAnimation(stepcount, (Long) 50);
                    circularProgressBar.setProgressMax(5000f);
                    reset.setOnClickListener(new View.OnClickListener() {
                        @Override
                        public void onClick(View view) {
                            stepcount=0;

                        }
                    });

                }
            }


            @Override
```

```java
        public void onAccuracyChanged(Sensor sensor, int i) {

        }
    };
    sensorManager.registerListener(obj, sensor, SensorManager.SENSOR_DELAY_NORMAL);
}
    @Override
    public void onPause() {
        super.onPause();
        SharedPreferences sharedPreferences
=this.getActivity().getPreferences(Context.MODE_PRIVATE);
        SharedPreferences.Editor ed = sharedPreferences.edit();
        ed.clear();
        ed.putInt("X", stepcount);
        ed.apply();
    }
    @Override
    public void onStop() {
        super.onStop();
        SharedPreferences sharedPreferences
=this.getActivity().getPreferences(Context.MODE_PRIVATE);
        SharedPreferences.Editor ed = sharedPreferences.edit();
        ed.clear();
        ed.putInt("X", stepcount);
        ed.apply();
    }

    @Override
    public void onResume() {
        super.onResume();
        SharedPreferences sharedPreferences
=this.getActivity().getPreferences(Context.MODE_PRIVATE);
        stepcount = sharedPreferences.getInt("X", 0);
    }

}
```
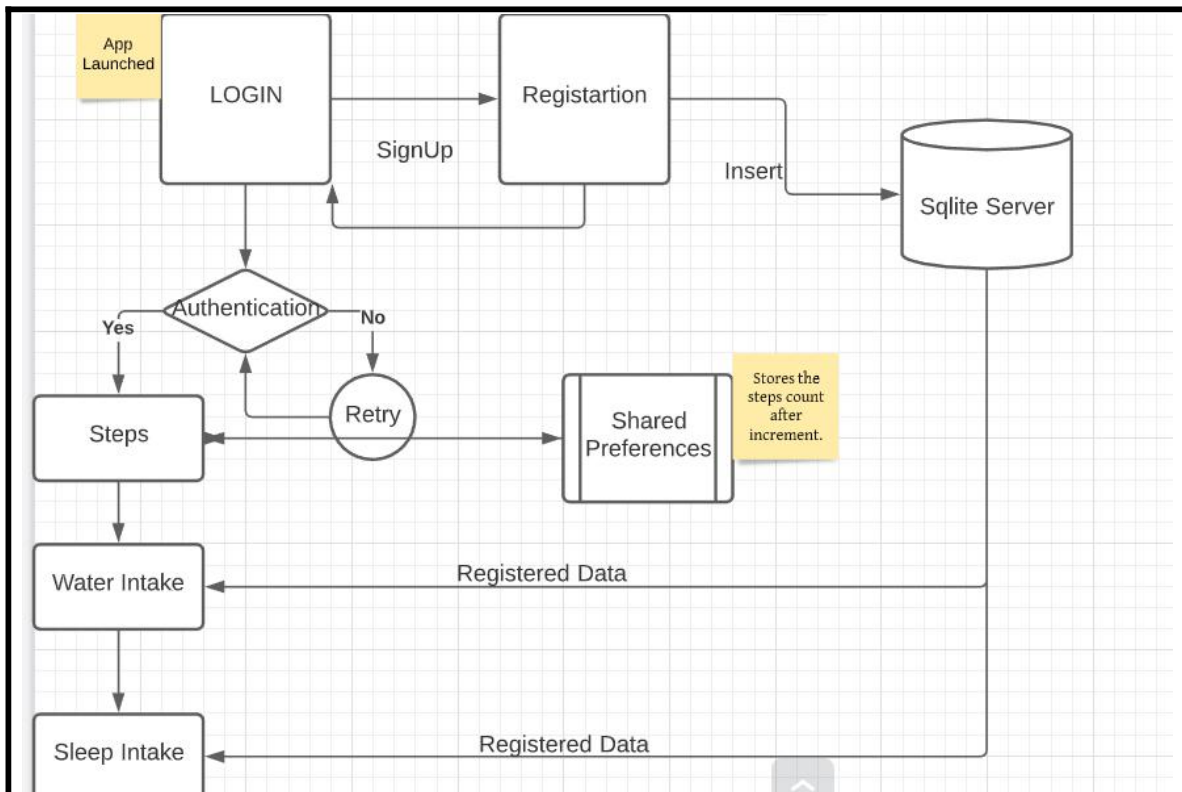
11) Data Flow Diagram

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12) Research done on Motion Sensor(Type_Accelerometer)

The Android platform provides several sensors that let you monitor the motion of a device.

The sensors' possible architectures vary by sensor type:

- The gravity, linear acceleration, rotation vector, significant motion, step counter, and step detector sensors are either hardware-based or software-based.

- The accelerometer and gyroscope sensors are always hardware-based.

Most Android-powered devices have an accelerometer, and many now include a gyroscope. The availability of the software-based sensors is more variable because they often rely on one or more hardware sensors to derive their data. Depending on the device, these software-based sensors can derive their data either from the accelerometer and magnetometer or from the gyroscope.

Motion sensors are useful for monitoring device movement, such as tilt, shake, rotation, or swing.

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The linear acceleration sensor provides you with a three-dimensional vector representing acceleration along each device axis, excluding gravity. You can use this value to perform gesture detection. The value can also serve as input to an inertial navigation system, which uses dead reckoning. I have implemented this sensor to track the steps taken by the user.

Sensor	Sensor event data	Description
TYPE_ACCELEROMETER	SensorEvent. values[0]	Acceleration force along the x axis (including gravity).
	SensorEvent. values[1]	Acceleration force along the y axis (including gravity).
	SensorEvent. values[2]	Acceleration force along the z axis (including gravity).

You typically use this sensor when you want to obtain acceleration data without the influence of gravity. For example, you could use this sensor to see how fast your car is going. The linear acceleration sensor always has an offset, which you need to remove. The simplest way to do this is to build a calibration step into your application. During calibration you can ask the user to set the device on a table, and then read the offsets for all three axes. You can then subtract that offset from the acceleration sensor's direct readings to get the actual linear acceleration.

The sensor coordinate system is the same as the one used by the acceleration sensor, as are the units of measure (m/s^2).

10)Conclusions:

The project has been completed successfully with maximum satisfaction. The constraints are met and overcome successfully.The system is designed like it was decided in the design phase.The project gives a good idea on developing a user friendly app and the system is very flexible,robust and enables the user to use it without any inconveinience.The project is more informative and helpful for understanding concepts of android,sensors and databases.