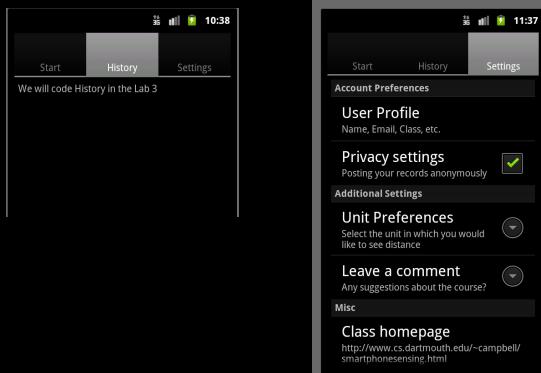




What you need to know for Lab 3

- After Lab 2 we have a settings all set but nothing in start and history tabs.
- Start allows the user to select an activity and history keeps a list of all activities undertaken in the past



what we will cover

- More UI and adapters
- Data persistence: SQLite
- Displaying activities from the SQLite

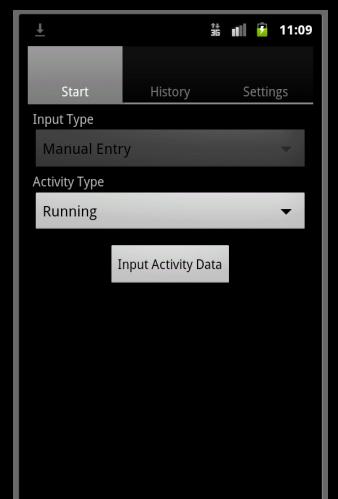
Quick look at our project for Lab 3.

There are a number of new activities and layout files: 1) ActivityManualInput and manualinput.xml; 2) ActivityDisplayEntry and display_entry; 4) history.xml associates with ActivityTabHistory; and3) DatabaseAdapter.

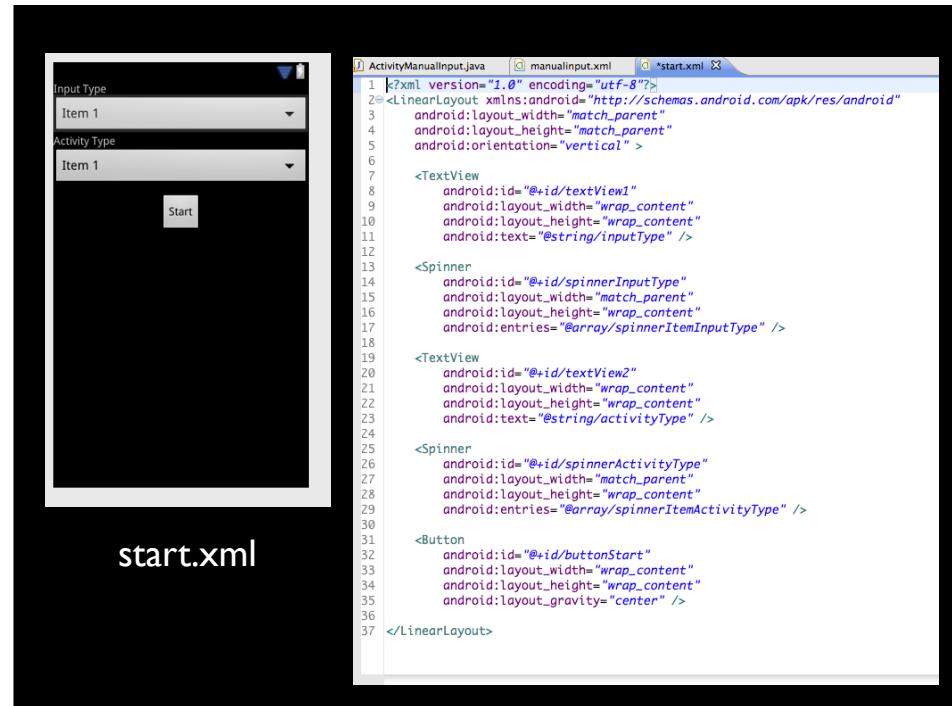
Also, we update some of the layout files we created last week: start.xml



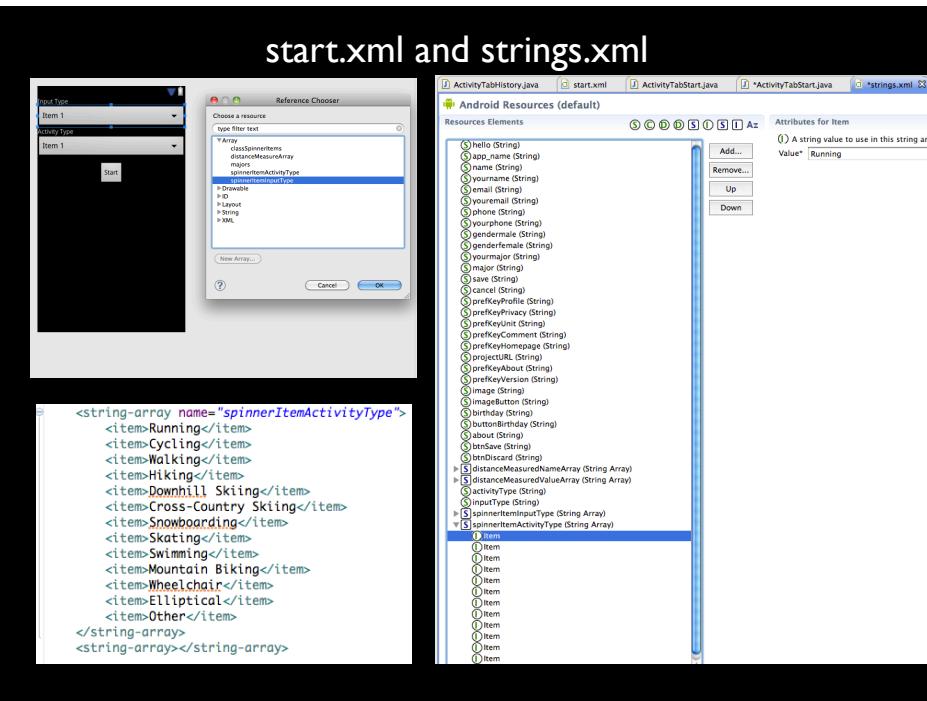
- The start activity allows automatic entry from GPS or, as in Lab3, just manual entry
 - The user selects an activity and inputs activity data.
 - Clicking InputActivityData fires an intent to ActivityManuallyInput



ActivityTabStart



start.xm



spinnerItemActivity in ActivityTabStart.java

ActivityTabStart fires intent for ActivityManualInput with extras for inputType and activityType

```

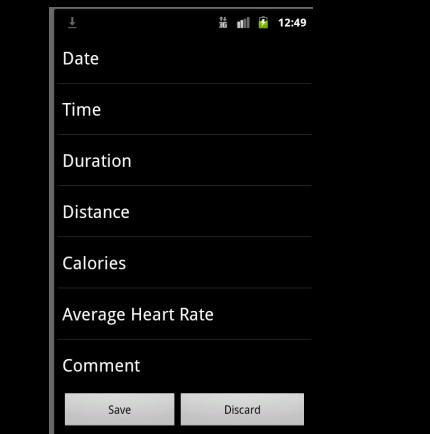
1 // ActivityTabStart.java
2
3 @Override
4 public void onCreate(Bundle savedInstanceState) {
5     super.onCreate(savedInstanceState);
6
7     mContext = this; // set the context to this activity
8     setContentView(R.layout.start);
9
10    Log.d(Globals.TAG, "entered onCreate ActivityTabStart");
11
12    // disable the GPS section of Input Type so its only Manual Entry
13
14    spinnerInputType = (Spinner) findViewById(R.id.spinnerInputType);
15    spinnerActivityType = (Spinner) findViewById(R.id.spinnerActivityType);
16
17    spinnerInputType.setSelection(1); // set to manual entry
18    spinnerInputType.setEnabled(false); // disable entry
19
20    btn = (Button) findViewById(R.id.buttonStart);
21    btn.setText("Input activity data");
22
23    View.OnClickListener myListener;
24
25    myListener = new View.OnClickListener() {
26        @Override
27        public void onClick(View v) {
28
29            // get current setting 1.0
30
31            int inputType = spinnerInputType.getSelectedItemPosition();
32
33            Bundle extras = new Bundle();
34
35            // get input selection (GPS, Manual)
36            extras.putInt("inputType", inputType);
37            // get input e.g., walking, cycling, etc.
38            extras.putInt("activityType",
39                         spinnerActivityType.getSelectedItemPosition());
40
41            Intent i;
42
43            if (inputType == 0) {
44                // TODO GPS intent
45            } else {
46                // Manual input
47                i = new Intent(mContext, ActivityManualInput.class);
48                i.putExtras(extras);
49                startActivity(i);
50            }
51        }
52    };
53
54
55    spinnerInputType.setOnItemSelectedListener(myListener);
56
57    spinnerInputType.setOnItemSelectedListener(new OnItemSelectedListener() {
58        @Override
59        public void onItemSelected(AdapterView<?> parent, View view,
60                                  int position, long id) {
61
62            if (position == 1) {
63                // Manual entry
64            } else {
65                // GPS entry
66            }
67        }
68
69        @Override
70        public void onNothingSelected(AdapterView<?> parent) {
71
72        }
73    });
74
75}

```

manualinput.xml



ActivityManualInput



Setup UI for ActivityManualInput in manualinput.xml

ListView and buttons

Setting up adapter to display using code

```

1 manualinput.xml
2
3 <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
4     android:layout_width="match_parent"
5     android:layout_height="match_parent"
6     android:orientation="vertical" >
7
8     <ListView
9         android:id="@+id/list"
10        android:layout_width="match_parent"
11        android:layout_height="0dp"
12        android:layout_weight="1" >
13
14     </ListView>
15
16     <LinearLayout
17         android:id="@+id/linearLayout1"
18         android:layout_width="match_parent"
19         android:layout_height="wrap_content" >
20
21         <Button
22             android:id="@+id/btnSave"
23             android:layout_width="wrap_content"
24             android:layout_height="wrap_content"
25             android:layout_weight="1"
26             android:text="@string/btnSave" />
27
28         <Button
29             android:id="@+id/btnDiscard"
30             android:layout_width="wrap_content"
31             android:layout_height="wrap_content"
32             android:layout_weight="1"
33             android:text="@string/btnDiscard" />
34
35     </LinearLayout>
36

```

change ListView id to @+id:id/list

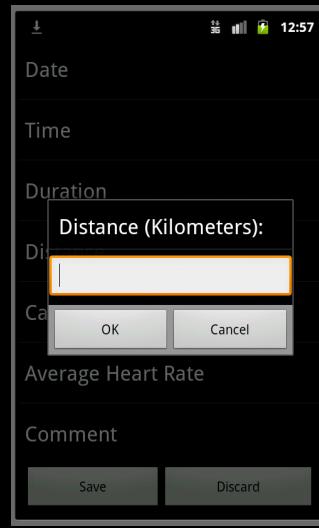
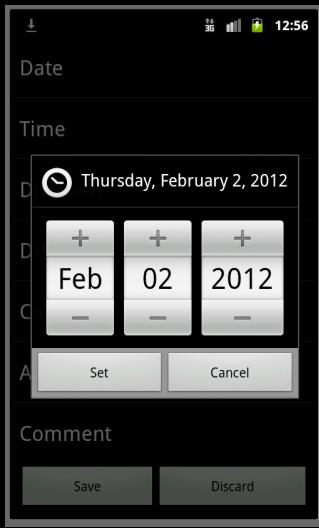
extend activity
ListActivity in ActivityManualInput

Note, layout_height =0 dp and layout_weight=1

manualinput.xml

```

1 manualinput.xml
2
3 package dartmouth.cs.myruns;
4
5 import java.util.Calendar;
6
7 public class ActivityManualInput extends ListActivity {
8
9     private static final int DIALOG_DATE_ID = 0;
10    private static final int DIALOG_TIME_ID = 1;
11    private static final int DIALOG_DURATION_ID = 2;
12    private static final int DIALOG_DISTANCE_ID = 3;
13    private static final int DIALOG_CALORIES_ID = 4;
14    private static final int DIALOG_HEARTRATE_ID = 5;
15    private static final int DIALOG_COMMENT_ID = 6;
16
17    private final String[] items = { "Date", "Time", "Duration", "Distance",
18                                    "Calories", "Heart Rate", "Comments" };
19
20    // Date member for exercise time.
21    private int mYear;
22    private int mMonth;
23    private int mDay;
24
25    private double mDistance;
26
27    @Override
28    protected void onCreate(Bundle savedInstanceState) {
29        // TODO Auto-generated method stub
30        super.onCreate(savedInstanceState);
31
32        setContentView(R.layout.manualinput);
33
34        setListAdapter(new ArrayAdapter<String>(this,
35                      android.R.layout.simple_list_item_1, items));
36
37        // get todays date and update date members.
38
39        final Calendar c = Calendar.getInstance();
40        mYear = c.get(Calendar.YEAR);
41        mMonth = c.get(Calendar.MONTH);
42        mDay = c.get(Calendar.DAY_OF_MONTH);
43
44        Log.d("MyRuns", "Today's date " + mYear + " " + mMonth + " " + mDay);
45    }
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```



Example dialogs for Date and Distance

```

@Override
protected void onListItemClick(ListView l, View v, int positionIsDialogId,
    long id) {
    // TODO Auto-generated method stub
    super.onListItemClick(l, v, positionIsDialogId, id);
    showDialog(positionIsDialogId);
}

@Override
protected Dialog onCreateDialog(int positionIsDialogId) {
    // TODO Auto-generated method stub
    // return super.onCreateDialog(id);

    final EditText textEntryView;

    // get stored preference (miles or km) or default
    SharedPreferences settings = PreferenceManager
        .getDefaultSharedPreferences(getApplicationContext());
    String distanceMeasure = settings.getString(
        getString(R.string.prefKeyUnit),
        getResources()
            .getStringArray(R.array.distanceMeasuredNameArray)[0]);
    switch (positionIsDialogId) {

```

Set up for creating a dialog (e.g., date, duration)
using showDialog in onListItemClick()

```

117
118    case DIALOG_DISTANCE_ID:
119
120        textEntryView = new EditText(this);
121        textEntryView.setInputType(InputType.TYPE_CLASS_NUMBER
122            | InputType.TYPE_NUMBER_FLAG_DECIMAL);
123
124        // OnClick for clicking OK
125        DialogInterface.OnClickListener OKListener = new DialogInterface.OnClickListener() {
126
127            @Override
128            public void onClick(DialogInterface dialog, int which) {
129                SharedPreferences settings = PreferenceManager
130                    .getDefaultSharedPreferences(getApplicationContext());
131
132                String distanceMeasure = settings.getString(
133                    getString(R.string.prefKeyUnit),
134                    getResources().getStringArray(
135                        R.array.distanceMeasuredNameArray)[0]);
136
137                mDistance = Double.parseDouble(textEntryView.getText()
138                    .toString());
139
140                // we always store in meters
141                mDistance *= Globals.KILO;
142                if (distanceMeasure.compareTo("Miles") == 0)
143                    mDistance *= Globals.KMMPMTILE_RATIO;
144            }
145
146        };
147
148        DialogInterface.OnClickListener CancelListener = new DialogInterface.OnClickListener() {
149
150            @Override
151            public void onClick(DialogInterface dialog, int which) {
152                textEntryView.setText("");
153            }
154        };
155
156        // builds the dialog box for distance
157        AlertDialog.Builder builder = new AlertDialog.Builder(this);
158        builder.setTitle("Distance");
159        builder.setView(textEntryView);
160        builder.setPositiveButton("OK", OKListener);
161        builder.setNegativeButton("Cancel", CancelListener);
162
163        // launch dialog
164        return builder.create();
165
166    }

```

Construct the dialog for distance and render

data persistence

SharedPreference for key/value pairs

Files (internal/external -- SD card)

Database (SQLite)

DataBaseAdapter.java

```
ActivityTabHistory.java ActivityManualInput.java DataBaseAdapter.java
23 public class DataBaseAdapter {
24     private static final String DATABASE_NAME = "MyRunDB";
25     private static final String TABLE_NAME_ENTRIES = "entries";
26
27     private static final int DATABASE_VERSION = 1;
28
29     public static final String KEY_ROWID = Globals.KEY_ROWID; // "-_L";
30     public static final String KEY_INPUT_TYPE = Globals.KEY_INPUT_TYPE; // "input_type";
31     public static final String KEY_ACTIVITY_TYPE = Globals.KEY_ACTIVITY_TYPE; // "activity_type";
32     public static final String KEY_DATE_TIME = Globals.KEY_DATE_TIME; // "date_time";
33     public static final String KEY_DURATION = Globals.KEY_DURATION; // "duration";
34     public static final String KEY_DISTANCE = Globals.KEY_DISTANCE; // "distance";
35     public static final String KEY_AVG_SPEED = Globals.KEY_AVG_SPEED; // "avg_speed";
36     public static final String KEY_AVG_SPEED = Globals.KEY_AVG_SPEED; // "KEY_AVG_SPEED";
37     public static final String KEY_CALORIES = Globals.KEY_CALORIES; // "calories";
38     public static final String KEY_CLIMB = Globals.KEY_CLIMB; // "climb";
39     public static final String KEY_AVG_HEARTRATE = Globals.KEY_AVG_HEARTRATE; // "avg_heartrate";
40     public static final String KEY_COMMENT = Globals.KEY_COMMENT; // "comment";
41     public static final String KEY_PRIVACY = Globals.KEY_PRIVACY; // "avg_privacy";
42     public static final String KEY_GPS_DATA = Globals.KEY_GPS_DATA; // "gps_data";
43
44     private static final String CREATE_TABLE_ENTRIES = "CREATE TABLE IF NOT EXISTS "
45         + "entries (id INTEGER PRIMARY KEY AUTOINCREMENT, "
46         + "input_type INTEGER NOT NULL, "
47         + "activity_type INTEGER NOT NULL, "
48         + "date_time DATETIME NOT NULL, "
49         + "duration INTEGER NOT NULL, "
50         + "distance FLOAT, "
51         + "avg_pace INTEGER, "
52         + "avg_speed INTEGER, "
53         + "calories INTEGER, "
54         + "avg_heartrate INTEGER, "
55         + "comment TEXT, "
56         + "privacy INTEGER, " + "gps_data BLOB " + ")";
57
58     // Variable to hold the database instance
59     private SQLiteDatabase db;
60     // Context of the application using the database.
61     // private final Context context;
62     // Database open/upgrade helper
63     private DBHelper dbHelper;
64
65     public DataBaseAdapter(Context context) {
66         dbHelper = new DBHelper(context, DATABASE_NAME, null, DATABASE_VERSION);
67     }
68
69 }
```

set up all pair/values (e.g., key_input_type) and
create_table_entries that forms

```
    mInput, mAttribute);
    DatabaseAdapter db = new DatabaseAdapter(mContext);
    db.open();
    long id = db.insertEntry(mInputType, mActivityType,
                           mDateTime, mDuration, mDistance, mCalories,
                           mComment);
    db.close();
    Toast.makeText(getApplicationContext(),
        "Entry #" + id + " saved.", Toast.LENGTH_SHORT)
    .show();
    finish();
}
```

Operations on the DB from ActivityManualInput

```
private static class DBHelper extends SQLiteOpenHelper {
    public DBHelper(Context context, String name, CursorFactory factory,
                    int version) {
        super(context, name, factory, version);
    }
    // Called when no database exists in disk and the helper class needs
    // to create a new one.
    @Override
    public void onCreate(SQLiteDatabase db) {
        try {
            db.execSQL(CREATE_TABLE_ENTRIES);
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

helper class creates a new database when constructed
using the db.execSQL(create_table_entries)

```

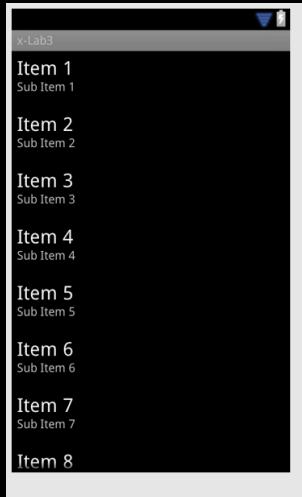
9
10 public DatabaseAdapter(Context context) {
11     dbHelper = new DBHelper(context, DATABASE_NAME, null, DATABASE_VERSION);
12 }
13
14 public DatabaseAdapter open() throws SQLException {
15     db = dbHelper.getWritableDatabase();
16     return this;
17 }
18
19 public void close() {
20     db.close();
21 }
22
23 public long insertEntry(int inputType, int activityType, GregorianCalendar time, long durationInSeconds,
24     int calories, String comment){
25
26     ContentValues value = new ContentValues();
27
28     value.put(KEY_INPUT_TYPE, inputType);
29     value.put(KEY_ACTIVITY_TYPE, activityType);
30     value.put(KEY_DATE_TIME, time.getTimeInMillis()/1000);
31     value.put(KEY_DURATION, durationInSeconds);
32     value.put(KEY_DISTANCE, distanceInMeters);
33     value.put(KEY_CALORIES, calories);
34     value.put(KEY_COMMENT, comment);
35
36     return db.insert(TABLE_NAME_ENTRIES, null, value);
37 }
38
39
40

```

Setting up the database, open() and insertEntry()



ActivityTabHistory is extended from ListActivity



history.xml ListView,
use @android:id/list

```

117 public Cursor fetchEntries() {
118     return db.query(TABLE_NAME_ENTRIES, new String[] { KEY_ROWID,
119         KEY_ACTIVITY_TYPE, KEY_DATE_TIME, KEY_DURATION, KEY_DISTANCE },
120         null, null, null, null, null);
121 }
122

```

fetchEntries()

```

27
28 public class ActivityTabHistory extends ListActivity {
29
30     private DatabaseAdapter mDb;
31     private Context mContext;
32     private ActivityEntriesCursorAdapter mAdapter;
33     private Cursor mActivityEntryCursor;
34
35     private int mRowIndexIndex;
36     private int mActivityIndex;
37     private int mTimeIndex;
38     private int mDurationIndex;
39     private int mDistanceIndex;
40
41     @Override
42     public void onCreate(Bundle savedInstanceState) {
43
44         super.onCreate(savedInstanceState);
45
46         setContentView(R.layout.history);
47         mContext = this;
48
49         mDb = new DatabaseAdapter(this);
50         mDb.open();
51         mActivityEntryCursor = mDb.fetchEntries();
52
53         mRowIndexIndex = mActivityEntryCursor.getColumnIndex(DatabaseAdapter.KEY_ROWID);
54         mActivityIndex = mActivityEntryCursor.getColumnIndex(DatabaseAdapter.KEY_ACTIVITY_TYPE);
55         mTimeIndex = mActivityEntryCursor.getColumnIndex(DatabaseAdapter.KEY_DATE_TIME);
56         mDurationIndex = mActivityEntryCursor.getColumnIndex(DatabaseAdapter.KEY_DURATION);
57         mDistanceIndex = mActivityEntryCursor.getColumnIndex(DatabaseAdapter.KEY_DISTANCE);
58
59         startManagingCursor(mActivityEntryCursor);
60         mAdapter = new ActivityEntriesCursorAdapter(
61             this, mActivityEntryCursor);
62         setListAdapter(mAdapter);
63     }
64

```

History uses a cursor and adapter to manage data

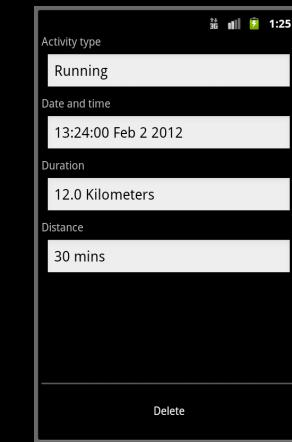
```

62
63 @Override
64 protected void onListItemClick(ListView l, View v, int position, long id) {
65
66     String activityTypes[] = getResources().getStringArray(R.array.spinnerItemActivityType);
67
68     mActivityEntryCursor.moveToPosition(position);
69
70     int i = mActivityEntryCursor.getInt(mActivityEntryCursor.getColumnIndex(Globals.KEY_ACTIVITY_TYPE));
71
72     Bundle extras = new Bundle();
73
74     extras.putLong(Globals.KEY_ROWID, mActivityEntryCursor.getLong(mRowIndex));
75     extras.putString(Globals.KEY_ACTIVITY_TYPE, parseActivityType(mActivityEntryCursor.getInt(mActivityIndex)));
76     extras.putString(Globals.KEY_DATE_TIME, parseTime(mActivityEntryCursor.getLong(mTimeIndex), false));
77     extras.putString(Globals.KEY_DURATION, parseDistance(mActivityEntryCursor.getDouble(mDistanceIndex)));
78     extras.putString(Globals.KEY_DISTANCE, parseDuration(mActivityEntryCursor.getInt(mDurationIndex)));
79
80     Intent intent = new Intent(mContext, ActivityDisplayEntry.class);
81     intent.putExtras(extras);
82
83     startActivity(intent);
84
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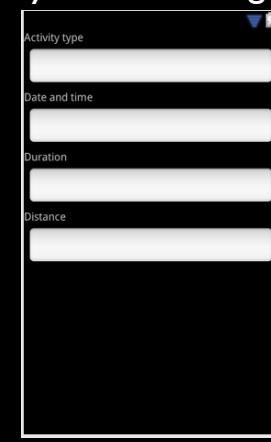
```

The intent used to start `ActivityDisplayEntry` uses extras to pass the data fetched from the cursor/ database

Displaying activities: in our design `ActivityTabHistory` reads the DB and passes (via extras and intent) the data to `ActivityDisplayEntry` for rendering



ActivityDisplayEntry



display_entries.xml

Let's look at the code