

PROGRAMMING HANDHELD SYSTEMS

CONTENTPROVIDER

TODAY'S TOPICS

CONTENTPROVIDER & CONTENTRESOLVER

CONTENTRESOLVER METHODS

CURSORLOADER

IMPLEMENTING CONTENTPROVIDERS

CONTENTPROVIDER

REPRESENTS A REPOSITORY OF STRUCTURED
DATA

ENCAPSULATES DATA SETS

ENFORCES DATA ACCESS PERMISSIONS

CONTENTPROVIDER

INTENDED FOR INTER-APPLICATION DATA
SHARING

CLIENTS ACCESS CONTENTPROVIDERS
THROUGH A CONTENTRESOLVER

CONTENTRESOLVER

PRESENTS A DATABASE-STYLE INTERFACE
FOR READING & WRITING DATA

QUERY, INSERT, UPDATE, DELETE, ETC.

PROVIDES ADDITIONAL SERVICES SUCH AS
CHANGE NOTIFICATION

CONTENTRESOLVER

GET REFERENCE TO CONTENTRESOLVER BY
CALLING `Context.getContentResolver()`

CONTENTPROVIDER & CONTENTRESOLVER

TOGETHER THESE CLASSES LET CODE RUNNING
IN ONE PROCESS ACCESS DATA MANAGED BY
ANOTHER PROCESS

ANDROID CONTENT PROVIDERS

BROWSER – BOOKMARKS, HISTORY

CALL LOG – TELEPHONE USAGE

CONTACTS – CONTACT DATA

MEDIA – MEDIA DATABASE

USERDICTIONARY – DATABASE FOR
PREDICTIVE SPELLING

MANY MORE

CONTENTPROVIDER DATA MODEL

DATA REPRESENTED LOGICALLY AS
DATABASE TABLES

_ID	artist
13	Lady Gaga
44	Frank Sinatra
45	Elvis Presley
53	Barbara Streisand

URI

CONTENT PROVIDERS REFERENCED BY
URIs

THE FORMAT OF THE URI IDENTIFIES
SPECIFIC DATA SETS MANAGED BY
SPECIFIC CONTENTPROVIDERS

FORMAT

CONTENT://AUTHORITY/PATH/ID

CONTENT – SCHEME INDICATING DATA THAT IS MANAGED BY A CONTENT PROVIDER

AUTHORITY – ID FOR THE CONTENT PROVIDER

PATH – 0 OR MORE SEGMENTS INDICATING THE TYPE OF DATA TO BE ACCESSED

ID – A SPECIFIC RECORD BEING REQUESTED

EXAMPLE: CONTACTS URI

```
ContactsContract.Contacts.CONTENT_URI =  
    "content://com.android.contacts/contacts/"
```

CONTENTRESOLVER.QUERY()

Cursor query (

Uri uri,	// ContentProvider Uri
String[] projection	// Columns to retrieve
String selection	// SQL selection pattern
String[] selectionArgs	// SQL pattern args
String sortOrder	// Sort order

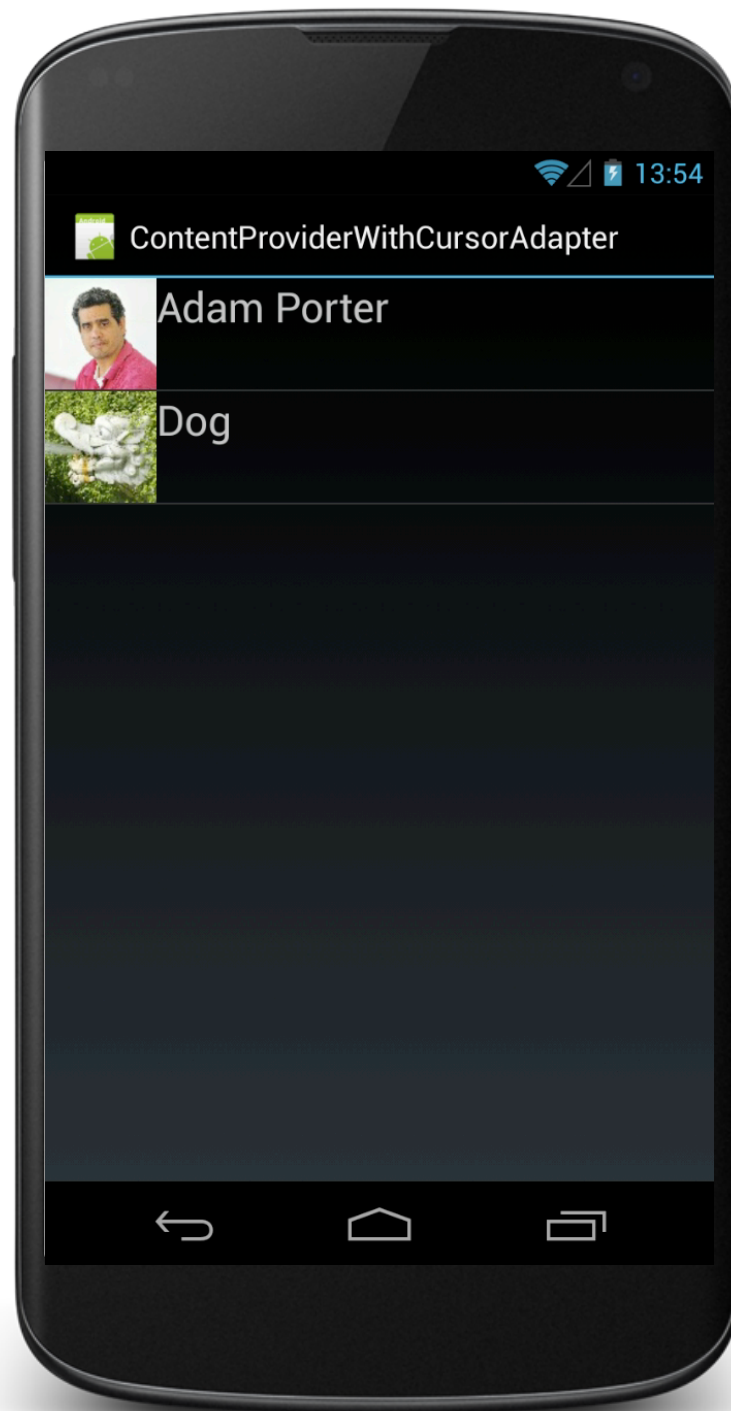
)

RETURNS A CURSOR FOR ITERATING OVER
THE SET OF RESULTS

CONTENTPROVIDERWITHCURSORADAPTER

EXTRACTS CONTACT INFORMATION FROM
THE ANDROID CONTACTS CONTENTPROVIDER

DISPLAYS EACH CONTACT'S NAME AND
PHOTO, IF AVAILABLE



Demonstration of the
ContentProviderWithCursorAdapter
project in the IDE

CURSORLOADER

CONDUCTING INTENSIVE OPERATIONS ON THE MAIN THREAD CAN AFFECT APPLICATION RESPONSIVENESS

CURSORLOADER USES AN ASYNCTASK TO PERFORM QUERIES ON A BACKGROUND THREAD

USING A CURSORLOADER

IMPLEMENT LOADERMANAGER'S
LOADERCALLBACKS INTERFACE

CREATE AND INITIALIZE A CURSOR LOADER

initLoader()

INITIALIZE AND ACTIVATE A LOADER

```
Loader<D> initLoader(  
    int id,  
    Bundle args,  
    LoaderCallbacks<D> callback)
```

LOADERCALLBACKS

CALLED TO INSTANTIATE AND RETURN A
NEW LOADER FOR THE SPECIFIED ID

```
Loader<D> onCreateLoader (  
    int id,  
    Bundle args)
```

LOADERCALLBACKS

CALLED WHEN A PREVIOUSLY CREATED
LOADER HAS FINISHED LOADING

```
void onLoadFinished(  
    Loader<D> loader,  
    D data)
```

LOADERCALLBACKS

CALLED WHEN A PREVIOUSLY CREATED
LOADER IS RESET

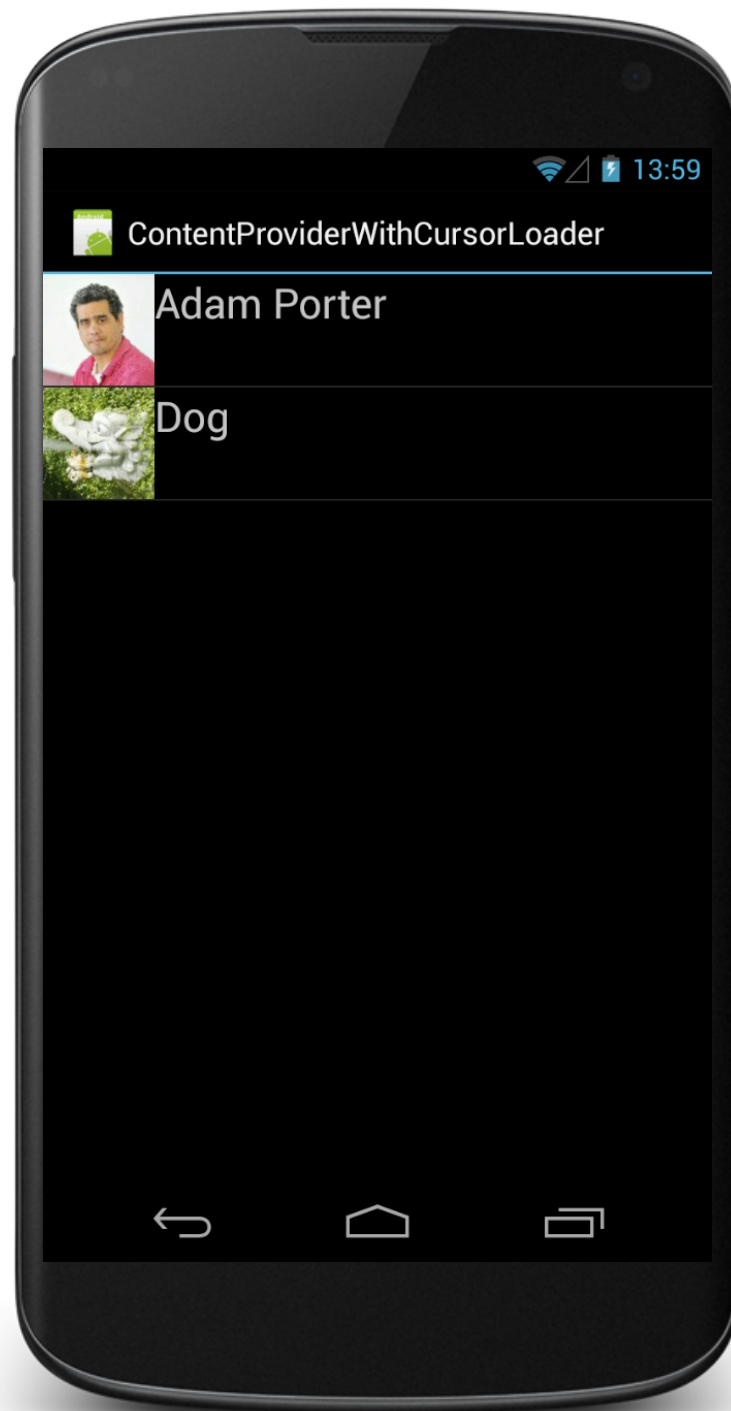
```
void onLoaderReset (  
    Loader<D> loader)
```

CONTENTPROVIDERWITHCURSORLOADER

EXTRACTS CONTACT INFORMATION FROM
THE ANDROID CONTACTS CONTENTPROVIDER

DISPLAYS EACH CONTACT'S NAME AND
PHOTO, IF AVAILABLE

BUT IT USES A CURSORLOADER WHEN
QUERYING THE CONTENTPROVIDER



Demonstration of the
ContentProviderWithCursorLoader
project in the IDE

ContentResolver.delete()

```
int delete (  
    Uri url,                // content Uri  
    String where,           // SQL sel. pattern  
    String[] selectArgs     // SQL pattern args  
)
```

RETURNS THE NUMBER OF ROWS
DELETED

ContentResolver.insert()

```
Uri insert (  
    Uri url,                // content Uri  
    ContentValues values    // values  
)
```

RETURNS THE URI OF THE INSERTED
ROW

ContentResolver.update()

```
Uri update(  
    Uri url,                // content Uri  
    ContentValues values    // new field values  
    String where,           // SQL sel. pattern  
    String[] selectionArgs  // SQL pattern args  
)
```

RETURNS THE NUMBER OF ROWS UPDATED

CONTENTPROVIDERINSERTCONTACTS

APPLICATION READS CONTACT
INFORMATION FROM THE ANDROID
CONTACTS CONTENTPROVIDER

INSERTS SEVERAL NEW CONTACTS INTO
CONTACTS CONTENTPROVIDER

DISPLAYS OLD AND NEW CONTACTS

DELETES THESE NEW CONTACTS ON EXIT



Demonstration of the
ContentProviderInsertContacts
project in the IDE

CREATING A CONTENTPROVIDER

IMPLEMENT A STORAGE SYSTEM FOR
THE DATA

DEFINE A CONTRACT CLASS TO SUPPORT
USERS OF YOUR CONTENTPROVIDER

IMPLEMENT A CONTENTPROVIDER
SUBCLASS

DECLARE AND CONFIGURE CONTENT
PROVIDER IN ANDROIDMANIFEST.XML

CONTENTPROVIDERCUSTOM

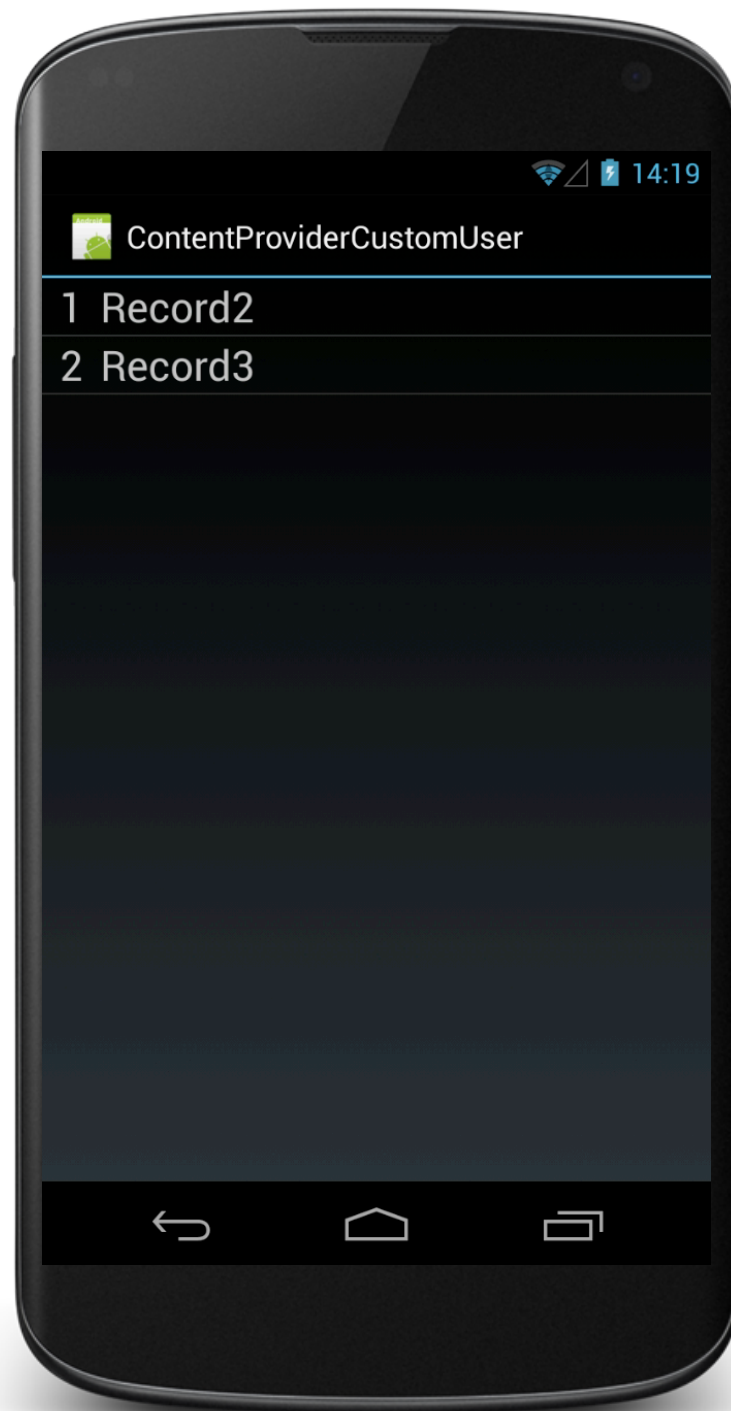
APPLICATION DEFINES A CONTENTPROVIDER
FOR ID/STRING PAIRS

Demonstration of the
ContentProviderCustom
project in the IDE

CONTENTPROVIDERCUSTOMUSER

READS ID/STRING PAIRS FROM THE
CONTENTPROVIDER WE JUST EXAMINED

DISPLAYS THE DATA IN A LISTVIEW



Demonstration of the
ContentProviderCustomUser
project in the IDE

NEXT TIME

SERVICE