

# Essential SQLite3

Section	Title	Page
One	<b>Introduction to SQL</b>	2
	– Definition of SQL	3
	– Definition of a Database	4
Two	<b>Database Tables</b>	5
Three	<b>The SQLite Interface</b>	10
	– Introduction	11
	– Running SQLite	12
	– DOS commands	14
	– Copying and Pasting	17
	– Exiting SQLite	20
Four	<b>Navigation of the Database</b>	21
	– Introduction	22
	– Transient vs Persistent	23
	– Saving Transient	24
	– Opening a Persistent Database	25
	– Contents of a Database	27
	– Basic interrogation of a Table	30
	– Changing the output (header)	35
	– Changing the output (mode)	36
	– Changing the output	51
	– Running existing SQL	53
	– <i>Exercise One</i>	55
	Five	<b>Simple Queries</b>
– Introduction		61
– Metadata		62
– SQL Syntax		66
– Displaying Literals in a Select statement		69
– Displaying Current Date in a Select statement		72
– Column Aliases		73
– Ordering Data in SQL		76
– Ordering More than One Column		79
– Concatenating Columns in SQL		80
– Performing Calculations in SQL		81
– Writing SQL to a File		82
– Commenting SQL		83
– Running SQL from the Command Line		84
– Running SQL in Batch		85
– <i>Exercise Two</i>	86	
Six	<b>Using Functions</b>	93
	– Counting Records in a Table	94
	– Summing Records in a Table	96
	– Highest/Lowest/Average Records in a Table	97
	– Distinct Records in a Table	98
	– Row Functions	99
	– Changing Case	100
	– How long is a piece of string	101
	– Rounding Values	102
	– Substring	104
	– Printf	106
	– Printf with Character	108
	– Printf with String	109
– Printf with Decimal	112	

## Essential SQLite3

Section	Title	Page
	– Printf with Float	113
	– Coalesce	115
	– Ifnull	117
	– <i>Exercise Three</i>	118
<b>Seven</b>	<b>Dates in SQLite</b>	122
	– Introduction	123
	– Date function	125
	– Years/Months/Days	126
	– Start of ...	128
	– Weekday	129
	– Time Elements	131
	– julianday	133
	– UNIXEPOCH	135
	– Localtime and UTC	136
	– strftime	137
	– <i>Exercise Four</i>	142
<b>Eight</b>	<b>Limiting Data Selected with a Where Clause</b>	144
	– Limiting Data in SQL	145
	– Equals	146
	– Not Equals	147
	– Less than / Greater than	148
	– IN	150
	– Between	151
	– Wildcards (Like)	153
	– Wildcards (Glob)	155
	– Column comparison	158
	– Handling Nulls	159
	– Case Restrictions	160
	– Using Functions	161
	– Joining Where Clauses	164
	– Sub-queries using IN	166
	– Sub-queries using more than one column	168
	– Sub-queries using Correlated Sub-queries	169
	– Sub-queries using Exists	171
	– Sub-queries using Not Exists	173
	– Sub-queries using other where clauses	174
	– Using Limit	175
	– Using sqlite_master	178
	– <i>Exercise Five</i>	180
<b>Nine</b>	<b>Aggregating Values</b>	186
	– Introduction	187
	– Group By	188
	– Having	191
	– Grand Total	193
	– <i>Exercise Six</i>	194
<b>Ten</b>	<b>Joining Tables in an SQL Statement</b>	198
	– Introduction	199
	– Identifying Columns and its Table	200
	– Cartesian products	202
	– Linking Tables	203
	– Methods of joining tables	205
	– Ansi SQL86	206
	– Outer Joins	208

## Essential SQLite3

Section	Title	Page
	- Ansi SQL99	209
	- Ansi SQL99 (Natural Joins)	210
	- Ansi SQL99 (Cross Joins)	211
	- Ansi SQL99 (Using)	212
	- Ansi SQL99 (On)	213
	- Ansi SQL99 (Multiple On)	214
	- Ansi SQL99 Outer Joins	215
	- Ansi SQL99 (Left Outer Join)	218
	- Ansi SQL99 (Right Outer Join)	219
	- Ansi SQL99 (Full Outer Join)	220
	- Merging Tables in SQL	221
	- Using Union to Merge Tables in SQL	222
	- Using Union All to Merge Tables in SQL	223
	- Using Intersect to Merge Tables in SQL	224
	- Using Minus to Merge Tables in SQL	225
	- Knowledge Check	226
	- Using the Merge Syntax in SQL	231
	- Using Minus	232
	- <i>Exercise Seven</i>	233
<b>Eleven</b>	<b>More SQL Query Techniques</b>	239
	- Using Inline SQL	240
	- Using Inline SQL with Select	241
	- Using Correlated Inline SQL with Select	242
	- Using Inline SQL with From	244
	- Using Case Function	245
	- Simple Case Syntax	246
	- Searched Case Syntax	249
	- Using Case in Where Clause	251
	- Nested Case	252
	- Instr	253
	- Trimming Data	254
	- Cast	257
	- With (Common Table Expression)	258
	- <i>Exercise Eight</i>	262
<b>Twelve</b>	<b>SQLite Datatypes</b>	267
	- Introduction	268
	- Text	269
	- Integer	270
	- Numeric	271
	- Blob	272
	- Real	273
	- Typeof	274
<b>Thirteen</b>	<b>Creating Database Objects</b>	275
	- Creating Tables	276
	- Mandatory Columns	278
	- Creation Syntax for Tables	279
	- Column Defaults	283
	- Column Checks	284
	- Dropping Tables	286
	- Creating Indexes in SQL	287
	- Creation Syntax for Primary Keys	290
	- AUTOINCREMENT	296
	- Creation Syntax for Foreign Keys	299

## Essential SQLite3

Section	Title	Page
	– On Delete / On Update	304
	– CASCADE	307
	– SET NULL	308
	– NO ACTION	309
	– RESTRICT	310
	– SET DEFAULT	311
	– Creation Syntax for Unique Indexes	312
	– Create Non-Unique Index syntax	317
	– Dropping Indexes	319
	– Renaming Tables	320
	– Adding Columns	321
	– Creating Temporary Tables	322
	– Problems with Tables in SQLite	324
<b>Fourteen</b>	<b>Database Views</b>	326
	– Introduction	327
	– Creating Views	330
	– Dropping Views	333
	– <i>Exercise Nine</i>	334
<b>Fifteen</b>	<b>Populating Tables</b>	336
	– Rules	337
	– Syntax	339
	– General Comments	345
	– Updating Records Rules	346
	– Updating Syntax	347
	– Deleting Records	349
	– Replace Syntax	350
	– Changes and Total Changes	353
	– ROWID	354
	– <i>Exercise Ten</i>	356
<b>Sixteen</b>	<b>Database Schemas</b>	362
	– Attach Databases	364
	– Referencing Attached Databases	365
	– Detach Databases	366
<b>Seventeen</b>	<b>Importing and Exporting Data</b>	367
<b>Eighteen</b>	<b>Committing Change</b>	371
	– Savepoints	376
	– Release	378
<b>Nineteen</b>	<b>SQLite startup</b>	379
<b>Twenty</b>	<b>Table Triggers</b>	383
	– Introduction	384
	– Events	386
	– When Conditions	388
	– Suggested Named Conventions	389
	– Syntax	390
	– Using Of with Update	392
	– When	393
	– Processing	394
	– Referencing Columns	395
	– Using Case Function	399
	– Using When Function	402
	– Processing with Raise	403
	– Processing with Raise (Ignore)	405
	– Processing with Raise (Rollback)	407

## Essential SQLite3

Section	Title	Page
	– Processing with Raise (Abort)	409
	– Processing with Raise (Fail)	411
	– Problems with Triggers	413
	– Viewing	416
	– Dropping	417
	– Instead of Triggers	418
	– Enabling / Disabling Triggers	423
	– Temp Triggers	426
	– <i>Exercise Eleven</i>	427
<b>Twenty One</b>	<b>Images in SQLite (Blobs)</b>	435
	– Readfile	437
	– Writefile	438
<b>Twenty Two</b>	<b>Miscellaneous Database Utilities</b>	439
	– Timer	440
	– Vacuum	442
	– Auto Vacuum	448
	– Cloning	449
	– Backup	450
	– Database Info	451
	– Dumping	452
	– Database Version	456
	– SQLite Version	457
	– Expression Based Index	458
<b>Twenty Three</b>	<b>DB Browser</b>	460
	– Introduction	461
	– Browse Table	466
	– Browse Table (Filtering)	468
	– Browse Table (Inserting/Deleting)	472
	– Modify Table	473
	– Delete Table	475
	– Copy Create statement	476
	– Export as CSV File	477
	– Browse Data	483
	– Edit Pragmas	484
	– Execute SQL	485
	– Other Options in DB Browser	491
<b>Twenty Four</b>	<b>SQLiteStudio</b>	492
	– Introduction	493
	– Topography	494
	– Add a Database	495
	– Opening Elements	497
	– Structure	499
	– Data	502
	– Data (Filtering)	506
	– Data (Filter by text)	507
	– Data (Filter by Regular Expression)	508
	– Data (Filter by SQL Expression)	516
	– Data (Exporting)	517
	– Data (Importing)	525
	– Data (Populate Table)	527
	– Data (Generate query)	529
	– Constraints	534
	– Indexes	535

## Essential SQLite3

Section	Title	Page
	- Triggers	537
	- DDL	539
	- Views	540
	- Other Options	542
	- <i>Exercise Twelve</i>	545

### Appendices

- Appendix S1 – SQL Functions**
- Appendix S2 – Dot Commands**
- Appendix S3 – Pragma settings**

### Delegate Questionnaire

