

## SQLite/purchase.py (Page 1 of 1)

```

1: #!/usr/bin/env python
2:
3: #-----
4: # purchase.py
5: # Author: Bob Dondero
6: #-----
7:
8: import sys
9: import contextlib
10: import sqlite3
11:
12: #-----
13:
14: DATABASE_URL = 'file:bookstore.sqlite?mode=rw'
15:
16: def main():
17:
18:     if len(sys.argv) != 3:
19:         print('Usage: python ' + sys.argv[0] + ' isbn custid',
20:               file=sys.stderr)
21:         sys.exit(1)
22:
23:     isbn = sys.argv[1]
24:     custid = sys.argv[2]
25:
26:     try:
27:         with sqlite3.connect(DATABASE_URL, isolation_level=None,
28:                               uri=True) as connection:
29:
30:             with contextlib.closing(connection.cursor()) as cursor:
31:
32:                 cursor.execute('BEGIN')
33:
34:                 stmt_str = "UPDATE orders SET quantity = quantity+1 "
35:                 stmt_str += "WHERE isbn = ? AND custid = ?"
36:                 cursor.execute(stmt_str, [isbn, custid])
37:
38:                 stmt_str = "UPDATE books SET quantity = quantity-1 "
39:                 stmt_str += "WHERE isbn = ?"
40:                 cursor.execute(stmt_str, [isbn])
41:
42:                 cursor.execute('COMMIT')
43:                 print('Transaction committed.')
44:
45:     except Exception as ex:
46:         print(ex, file=sys.stderr)
47:         sys.exit(1)
48:
49: #-----
50:
51: if __name__ == '__main__':
52:     main()

```

## SQLite/recovery.py (Page 1 of 1)

```

1: #!/usr/bin/env python
2:
3: #-----
4: # recovery.py
5: # Author: Bob Dondero
6: #-----
7:
8: import sys
9: import random
10: import contextlib
11: import sqlite3
12:
13: #-----
14:
15: DATABASE_URL = 'file:bookstore.sqlite?mode=rw'
16:
17: def main():
18:
19:     if len(sys.argv) != 1:
20:         print('Usage: python ' + sys.argv[0], file=sys.stderr)
21:         sys.exit(1)
22:
23:     try:
24:         with sqlite3.connect(DATABASE_URL, isolation_level=None,
25:                               uri=True) as connection:
26:
27:             with contextlib.closing(connection.cursor()) as cursor:
28:
29:                 for i in range(20):
30:
31:                     cursor.execute('BEGIN')
32:
33:                     stmt_str = "UPDATE orders "
34:                     stmt_str += "SET quantity = quantity+1 "
35:                     stmt_str += "WHERE isbn = '123' "
36:                     stmt_str += "AND custid = '222'"
37:                     cursor.execute(stmt_str)
38:
39:                     # Simulate a HW/SW failure occurring randomly,
40:                     # on average every 5th time through the loop.
41:                     if random.randrange(5) == 0:
42:                         print('Simulated failure with i = %d' % i)
43:                         cursor.execute('ROLLBACK')
44:                         print('Transaction %d rolled back.' % i)
45:                         continue
46:
47:                     stmt_str = "UPDATE books "
48:                     stmt_str += "SET quantity = quantity-1 "
49:                     stmt_str += "WHERE isbn = '123'"
50:                     cursor.execute(stmt_str)
51:
52:                     cursor.execute('COMMIT')
53:                     print('Transaction %d committed.' % i)
54:
55:     except Exception as ex:
56:         print(ex, file=sys.stderr)
57:         sys.exit(1)
58:
59: #-----
60:
61: if __name__ == '__main__':
62:     main()

```

## SQLite/bookstorefancy.sql (Page 1 of 2)

```

1: PRAGMA foreign_keys = ON;
2:
3: DROP TABLE IF EXISTS orders;
4: DROP TABLE IF EXISTS customers;
5: DROP TABLE IF EXISTS authors;
6: DROP TABLE IF EXISTS books;
7: DROP TABLE IF EXISTS zipcodes;
8:
9: -----
10:
11: CREATE TABLE books (
12:     isbn TEXT NOT NULL,
13:     title TEXT,
14:     quantity INTEGER,
15:     PRIMARY KEY (isbn));
16:
17: INSERT INTO books (isbn, title, quantity)
18:     VALUES ('123','The Practice of Programming',500);
19: INSERT INTO books (isbn, title, quantity)
20:     VALUES ('234','The C Programming Language',800);
21: INSERT INTO books (isbn, title, quantity)
22:     VALUES ('345','Algorithms in C',650);
23:
24: -----
25:
26: CREATE TABLE authors (
27:     isbn TEXT NOT NULL,
28:     author TEXT NOT NULL,
29:     PRIMARY KEY (isbn, author),
30:     FOREIGN KEY (isbn) REFERENCES books(isbn));
31:
32: INSERT INTO authors (isbn, author)
33:     VALUES ('123','Kernighan');
34: INSERT INTO authors (isbn, author)
35:     VALUES ('123','Pike');
36: INSERT INTO authors (isbn, author)
37:     VALUES ('234','Kernighan');
38: INSERT INTO authors (isbn, author)
39:     VALUES ('234','Ritchie');
40: INSERT INTO authors (isbn, author)
41:     VALUES ('345','Sedgewick');
42:
43: -----
44:
45: CREATE TABLE zipcodes (
46:     zipcode TEXT NOT NULL,
47:     city TEXT,
48:     state TEXT,
49:     PRIMARY KEY (zipcode));
50:
51: INSERT INTO zipcodes (zipcode, city, state)
52:     VALUES ('08540','Princeton', 'NJ');
53: INSERT INTO zipcodes (zipcode, city, state)
54:     VALUES ('02138','Cambridge', 'MA');
55: INSERT INTO zipcodes (zipcode, city, state)
56:     VALUES ('02142','Cambridge', 'MA');
57:
58: -----
59:
60: CREATE TABLE customers (
61:     custid TEXT NOT NULL,
62:     custname TEXT,
63:     street TEXT,
64:     zipcode TEXT,
65:     PRIMARY KEY (custid),

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## SQLite/bookstorefancy.sql (Page 2 of 2)

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66:     FOREIGN KEY (zipcode) REFERENCES zipcodes(zipcode));
67:
68: INSERT INTO customers (custid, custname, street, zipcode)
69:     VALUES ('111','Princeton', '114 Nassau St', '08540');
70: INSERT INTO customers (custid, custname, street, zipcode)
71:     VALUES ('222','Harvard', '1256 Mass Ave', '02138');
72: INSERT INTO customers (custid, custname, street, zipcode)
73:     VALUES ('333','MIT', '292 Main St', '02142');
74:
75: -----
76:
77: CREATE TABLE orders (
78:     isbn TEXT NOT NULL,
79:     custid TEXT NOT NULL,
80:     quantity INTEGER,
81:     PRIMARY KEY (isbn, custid),
82:     FOREIGN KEY (isbn) REFERENCES books(isbn),
83:     FOREIGN KEY (custid) REFERENCES customers(custid));
84:
85: INSERT INTO orders (isbn, custid, quantity)
86:     VALUES ('123','222',20);
87: INSERT INTO orders (isbn, custid, quantity)
88:     VALUES ('345','222',100);
89: INSERT INTO orders (isbn, custid, quantity)
90:     VALUES ('123','111',30);

```