Introduction to

Databases with SQL

Writing

71541 MUSEUM OF FINE ARTS, BOSTON, MASS.

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Create

Read

Update

Delete

Insert

id	title	accession_number	acquired

Profusion of flowers

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12

Farmers working at dawn

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12
2	Farmers working at dawn	11.6152	1911-08-03

Spring outing

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12
2	Farmers working at dawn	11.6152	1911-08-03
3	Spring outing	14.76	1914-01-08

```
INSERT INTO table (column0, …)
VALUES
(value0, …);
```

```
INSERT INTO table (column0, …)
VALUES
(value0, …),
(value1, …),
…;
```

```
id,title,accession_number,acquired
1,Profusion of flowers,56.257,1956-04-12
2,Farmers working at dawn,11.6152,1911-08-03
3,Spring outing,14.76,1914-01-08
4,Imaginative landscape,56.496,
5,Peonies and butterfly,06.1899,1906-01-01
```

```
.import
```

```
.import --csv --skip 1
```

```
id,title,accession_number,acquired
1,Profusion of flowers,56.257,1956-04-12
2,Farmers working at dawn,11.6152,1911-08-03
3,Spring outing,14.76,1914-01-08
4,Imaginative landscape,56.496,
5,Peonies and butterfly,06.1899,1906-01-01
```

```
title,accession_number,acquired
Profusion of flowers,56.257,1956-04-12
Farmers working at dawn,11.6152,1911-08-03
Spring outing,14.76,1914-01-08
Imaginative landscape,56.496,
Peonies and butterfly,06.1899,1906-01-01
```

```
INSERT INTO table0 (column0, …)
SELECT column0, … FROM table1;
```

Delete

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12
2	Farmers working at dawn	11.6152	1911-08-03
3	Spring outing	14.76	1914-01-08
4	Imaginative landscape	56.496	NULL
5	Peonies and butterfly	06.1899	1906-01-01
6	Tile Lunette	06.2437	1906-11-08
7	Statuette of a shrew	01.105	1901-02-11

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12
2	Farmers working at dawn	11.6152	1911-08-03
3	Spring outing	14.76	1914-01-08
4	Imaginative landscape	56.496	NULL
5	Peonies and butterfly	06.1899	1906-01-01
6	Tile Lunette	06.2437	1906-11-08
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4	Imaginative landscape	56.496	NULL
5	Peonies and butterfly	06.1899	1906-01-01
6	Tile Lunette	06.2437	1906-11-08
7	Statuette of a shrew	01.105	1901-02-11

```
DELETE FROM table WHERE condition;
```

id	title	accession_number	acquired
1	Profusion of flowers	56.257	1956-04-12
2	Farmers working at dawn	11.6152	1911-08-03
5	Peonies and butterfly	06.1899	1906-01-01
6	Tile Lunette	06.2437	1906-11-08
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id	title	accession_number	acquired
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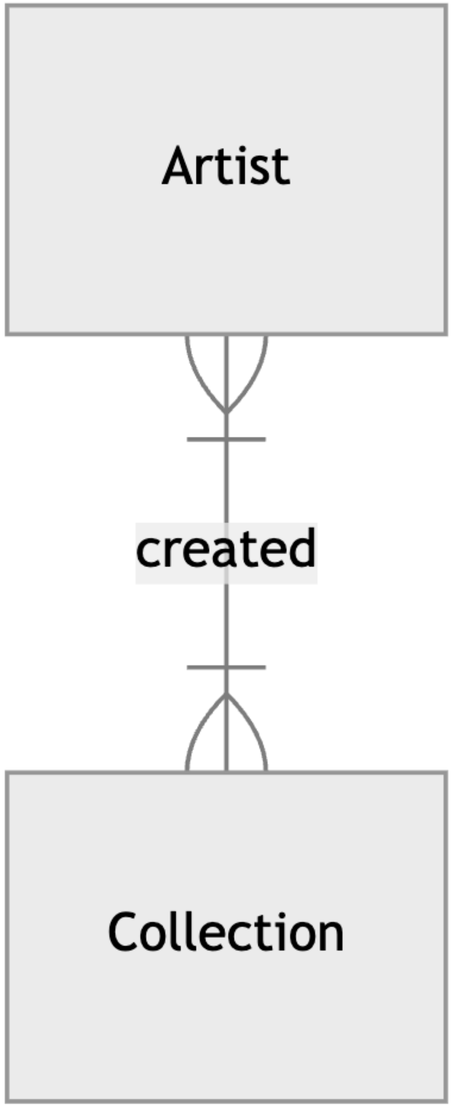
Foreign Key Constraints


Artist
created
Collection

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
1	2
2	3
3	1
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
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2	3
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collections

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2	3
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collections

id	title
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2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
4	Zhou Chen

created

artist_id	collection_id
1	2
2	3
3	1
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE …
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE RESTRICT
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE NO ACTION
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE SET NULL
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE SET DEFAULT
```

```
FOREIGN KEY("artist_id") REFERENCES "artists"("id")
ON DELETE CASCADE
```

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
2	3
3	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
2	3
3	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
4	Zhou Chen

created

artist_id	collection_id
2	3
3	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
4	Zhou Chen

created

artist_id	collection_id
2	3
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

Update

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
2	3
3	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
2	3
3	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

artists

id	name
1	Li Yin
2	Qian Weicheng
3	Unidentified artist
4	Zhou Chen

created

artist_id	collection_id
2	3
1	1
1	2
4	4

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

```
UPDATE table
SET column0 = value0, …
WHERE condition;
```

Triggers

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

transactions

id	title	action

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Spring outing

transactions

id	title	action

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...

transactions

id	title	action

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...

transactions

id	title	action
1	Spring outing	sold

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...

transactions

id	title	action
1	Spring outing	sold

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Peonies and ...

transactions

id	title	action
1	Spring outing	sold

collections

id	title
1	Farmers working ...
2	Imaginative land...
3	Profusion of ...
4	Peonies and ...

transactions

id	title	action
1	Spring outing	sold
2	Peonies and ...	bought

```
CREATE TRIGGER name
```

```
CREATE TRIGGER name

AFTER
```

```
CREATE TRIGGER name

BEFORE
```

```
CREATE TRIGGER name
BEFORE INSERT ON table
```

```
CREATE TRIGGER name
BEFORE UPDATE OF column ON table
```

```
CREATE TRIGGER name
BEFORE DELETE ON table
```

```
CREATE TRIGGER name
BEFORE DELETE ON table
FOR EACH ROW
```

```
CREATE TRIGGER name
BEFORE DELETE ON table
FOR EACH ROW
BEGIN
```

```
CREATE TRIGGER name
BEFORE DELETE ON table
FOR EACH ROW
BEGIN
    …;
```

```
CREATE TRIGGER name
BEFORE DELETE ON table
FOR EACH ROW
BEGIN
    …;
END;
```

Soft Deletions

collections

id	title	deleted
1	Farmers working ...	0
2	Imaginative land...	0
3	Profusion of ...	0
4	Peonies and ...	0

collections

id	title	deleted
1	Farmers working ...	0
2	Imaginative land...	0
3	Profusion of ...	0
4	Peonies and ...	0

collections

id	title	deleted
1	Farmers working ...	1
2	Imaginative land...	0
3	Profusion of ...	0
4	Peonies and ...	0

Introduction to

Databases with SQL

Writing