

# Database Structure & Adv. Joins

# Basic rules of database structure

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- ▶ Order doesn't matter
  - ▶ The information should not be dependent on the order of the rows or the order of the columns
- ▶ No duplicate rows
- ▶ Every row-column combination contains one value
- ▶ One field per type of information



# Basic rules of database structure

ID	New Code	OldCode	ScientificName	Taxa	CommonName
1	AB	BS, BT	Amphispiza bilineata	Bird	black-throated spar
2	AH	AH	Ammospermophilus harrisi	Rodent-n	
3	AS	AS, GS	Ammodramus savannarum	Bird	
4	BA	BA	Baiomys taylori	Rodent	Baiomys taylori
5	CB	CW	Campylorhynchus brunneicap	Bird	cactus wren
6	CM	LB	Calamospiza melanocorys	Bird	lark bunting
7	CQ	SQ	Callipepla squamata	Bird	scaled quail
8	CS	CS	Crotalus scutalatus	Reptile	snake
9	CT	CT	Cnemidophorus tigris	Reptile	lizard
10	CU	CU	Cnemidophorus uniparens	Reptile	lizard
11	CV	CV	Crotalus viridis	Reptile	rattle snake
12	DM	DM	Dipodomys merriami	Rodent	
13	DO	DO, D0	Dipodomys ordii	Rodent	
14	DS	DS	Dipodomys spectabilis	Rodent	
15	DX	D, D?, DU, D	Dipodomys sp.	Rodent	Dipo spp.
16	EO		Eumeces obsoletus	Reptile	great plains skink

Record 1 of 36 \*

# Basic rules of database structure

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<b>Scientific Name</b>	<b>New SpeciesID</b>	<b>Old SpeciesID</b>
Amphispiza bilineata	AB	BS, BT
Ammospermophilis harrisi	AH	AH
Ammodramus savanarrum	AS	AS, GS



<b>Scientific Name</b>	<b>New SpID</b>	<b>Old SpID</b>	<b>Old SpID 2</b>
Amphispiza bilineata	AB	BS	BT
Ammospermophilis harrisi	AH	AH	
Ammodramus savanarrum	AS	AS	GS



# Basic rules of database structure

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<b>Scientific Name</b>	<b>New SpeciesID</b>
Amphispiza bilineata	AB
Ammospermophilis harrisi	AH
Ammodramus savanarrum	AS

<b>New SpID</b>	<b>Old SpID</b>
AB	BS
AB	BT
AH	AH
AS	AS
AS	GS



# Basic rules of database structure

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- ▶ A table should not contain redundant information

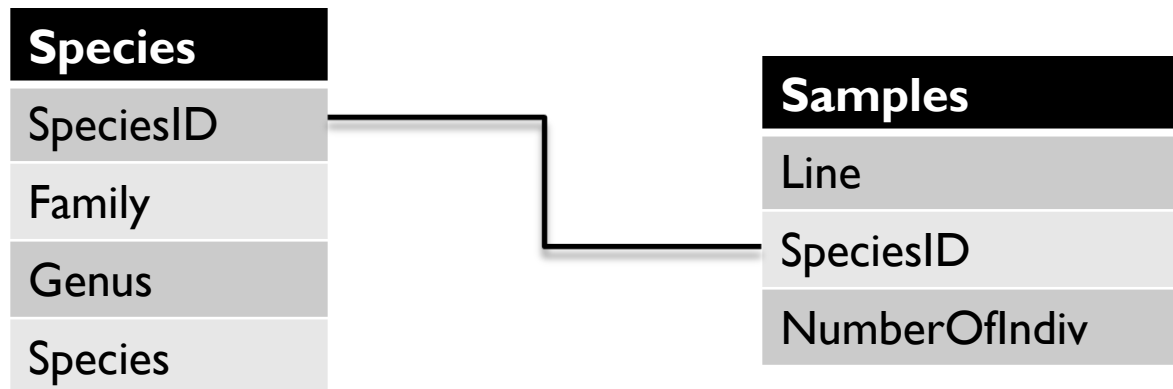
Line	Family	Genus	Species	N(Ind.)
6	ACERACEAE	ACER	SACCHARINUM	1
8	ACERACEAE	ACER	SACCHARINUM	1
9	ACERACEAE	ACER	SACCHARINUM	1
5	ACERACEAE	ACER	SACCHARUM	1
7	ACERACEAE	ACER	SACCHARUM	1
9	ACERACEAE	ACER	SACCHARUM	6
5	CAPRIFOLIACEAE	VIBURNUM	LENTAGO?	2
1	CORNACEAE	CORNUS	FLORIDA	4
10	CORNACEAE	CORNUS	FLORIDA	5
2	CORNACEAE	CORNUS	FLORIDA	1
3	CORNACEAE	CORNUS	FLORIDA	3
4	CORNACEAE	CORNUS	FLORIDA	5
5	CORNACEAE	CORNUS	FLORIDA	1
6	CORNACEAE	CORNUS	FLORIDA	6
7	CORNACEAE	CORNUS	FLORIDA	2
8	CORNACEAE	CORNUS	FLORIDA	5
9	CORNACEAE	CORNUS	FLORIDA	4
10	CUPRESSACEAE	JUNIPERUS	VIRGINIANA	2
10	FABACEAE	CERCIS	CANADENSIS	1
2	FABACEAE	CERCIS	CANADENSIS	1

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# Types of Joins

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- ▶ **Inner**

- ▶ Returns rows where there is a match in both tables

- ▶ **Left**

- ▶ Returns all rows from the left table even if there is no match in the right table

- ▶ **Right**

- ▶ Returns all rows from the right table even if there is no match in the left table

- ▶ **Full**

- ▶ Returns where there is a match in one of the tables



# Nested Joins

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- ▶ Tables can be strung together using joins so that two tables are only connected to each other through a third table

