Table, Field, Record

Basic Identification

Database management system (DBMS)

- A program which manages the structure of the database.
- Simple examples of DBMS include Filemaker and Access.
- Corporations use make larger and more complex ones: Oracle and DB2 are fairly common.

A DBMS allows users to:

- (1) create the tables and fields required
- (2) Add, delete and modify records in the tables
- (3) Print out the database contents in Reports
- (4) Allow Queries on the database.
- (5) Handles security on the database
- (6) Backs up the data so none is lost.
- (7) Multi-user access control- allows many people to open and modify the same data.

Databases Rule the World.

Databases run the world.

- All social media: Facebook, Twitter
- Student records in schools
- Banking: Debit, Accounts, Credit cards
- Cell Phone: GPS, who you call, text messages
- Governments: Licenses, Healthcare data, Tax information, Criminal records
- Inventory in companies and stores
- The Internet: websites, addressing
- Cloud computing
- Google, Bing, yahoo!
- Email servers: Gmail, Hotmail…

Pieces of a Database

- Table
- Field
- Record


123RF


no

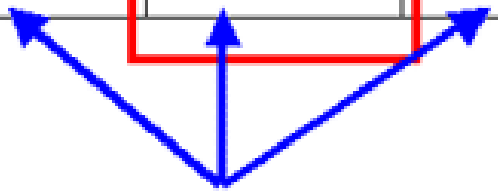
A table:

First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39
Donald	Duck	555 Quack Street	Mallard	65
Bugs	Bunny	567 Carrot Street	Rascal	58
Wiley	Coyote	999 Acme Way	Canyon	61
Cat	Woman	234 Purrfect Street	Hairball	32
Tweety	Bird	543	Itotltaw	28

Field

- Defines a category of information stored in a database.
- A column in a table.
- For example, a telephone number or a birth date.

First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39
Donald	Duck	555 Quack Street	Mallard	65
Bugs	Bunny	567 Carrot Street	Rascal	58
Wiley	Coyote	999 Acme Way	Canyon	61
Cat	Woman	234 Purrfect Street	Hairball	32
Tweety	Bird	543	Itotltaw	28



Fields

Record

- A logically connected set of one or more fields
- Describes the person, place or thing that the database is about.
- It is a row on a table.
- For example, all of the fields that make up one customer’s set of data.

First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39
Donald	Duck	555 Quack Street	Mallard	65
Bugs	Bunny	567 Carrot Street	Rascal	58
Wiley	Coyote	999 Acme Way	Canyon	61
Cat	Woman	234 Purrfect Street	Hairball	32
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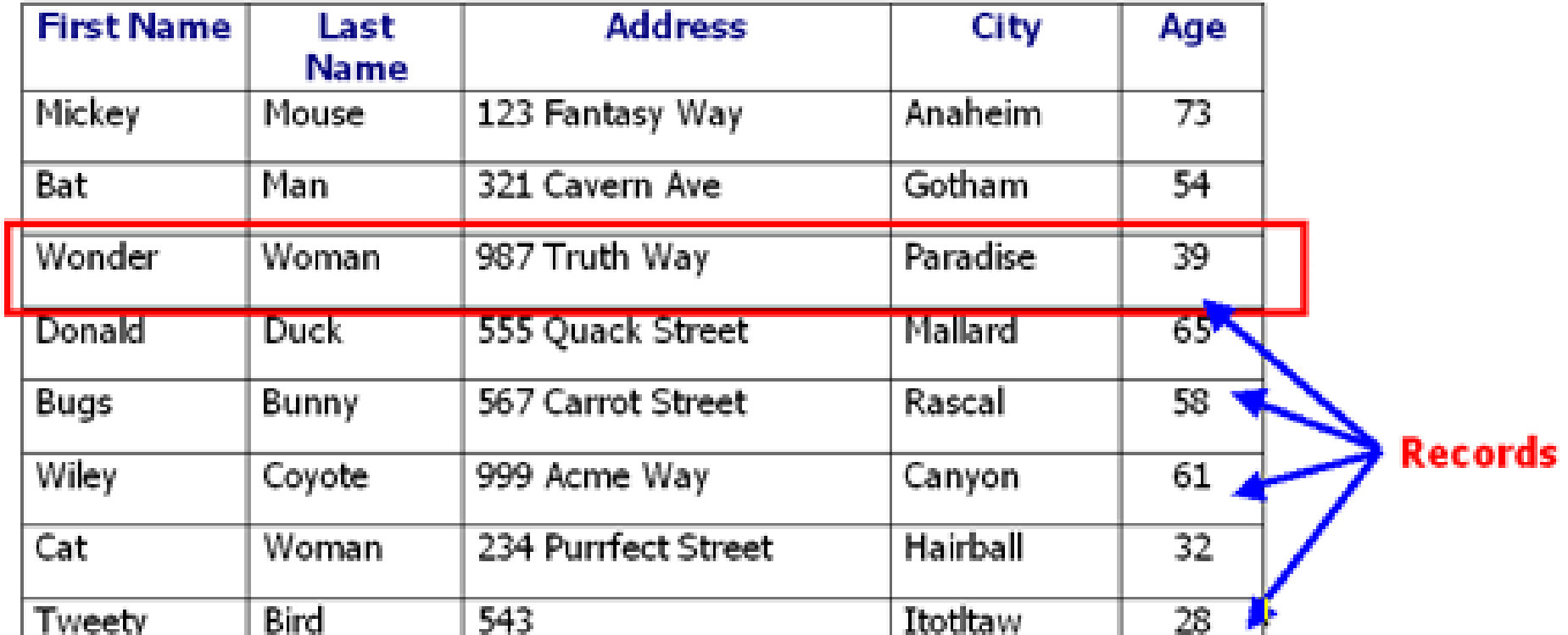
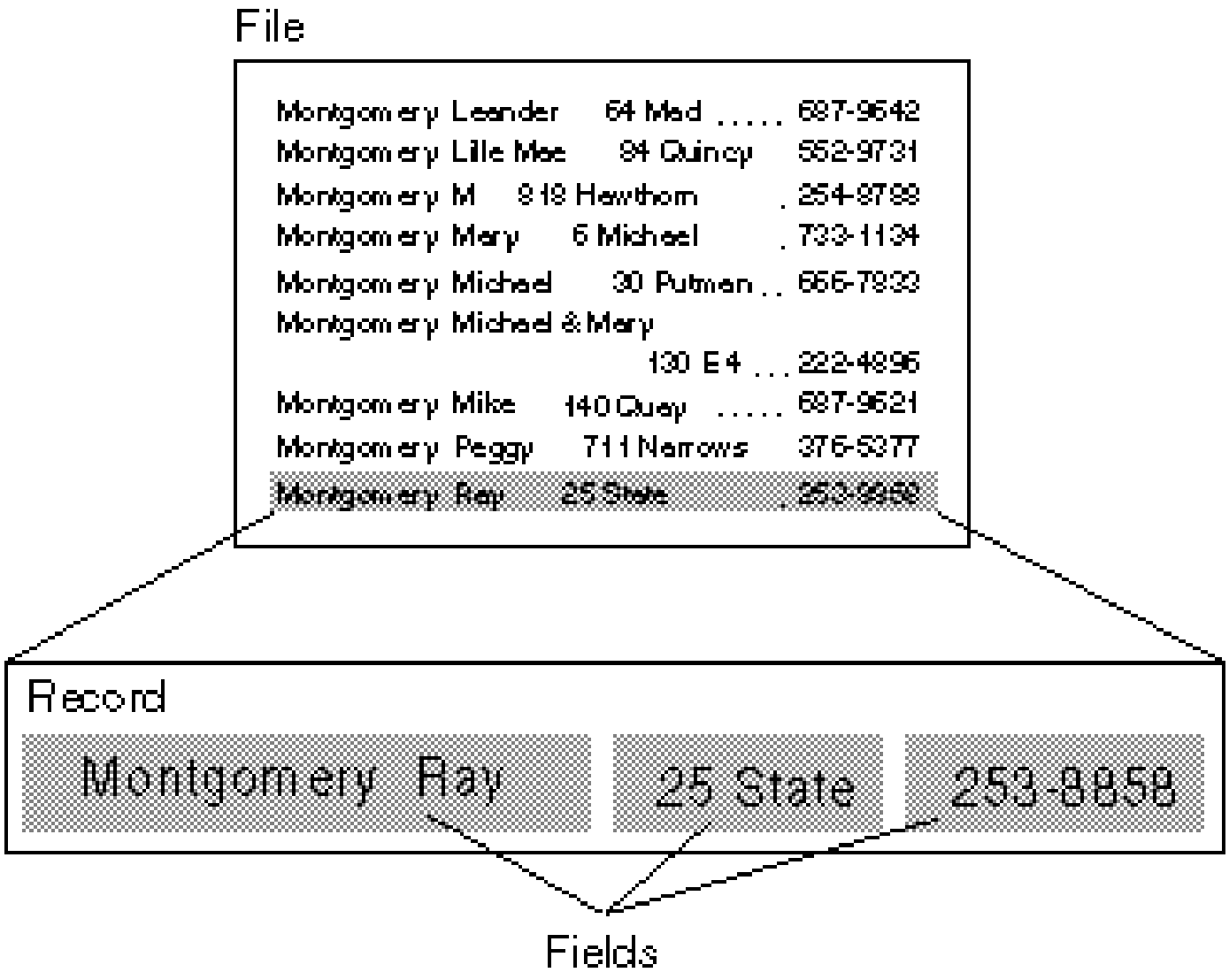


KeyField

- The field that uniquely identifies a record.
- It is used to distinguish between two similar records.
- Without a keyfield, information can not easily be found. Repetitions get lost.
- It is often a number that is assigned to each record, like a student number or a credit card number.


File
Montgomery Leander 64 Mad 687-9642
Montgomery Lilie Mae 84 Quincy 552-9731
Montgomery M 818 Hawthorn . 254-8788
Montgomery Mary 6 Michael . 733-1134
Montgomery Michael 30 Putnam .. 666-7833
Montgomery Michael & Mary
130 E4 ... 222-4896
Montgomery Mike 140 Quay 687-9621
Montgomery Peggy 711 Narrows 376-5377
Montgomery Ray 25 State . 253-8858
Record
Montgomery Ray
25 State
253-8858
Fields

1. How many tables? What are their names?

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

ProjectId	ProjectName
1214	Antigravity
1709	Teleportation
1737	Time Travel

Experiment

ProjectId	ExperimentId	NumInvolved	ExperimentDate	Hours
1214	1	1	NULL	1.5
1214	2	1	1889-11-01	14.3
1709	1	3	1891-01-22	7.0
1709	2	1	1891-02-23	7.2
1737	1	1	1900-07-05	-1.0
1737	2	2	1900-07-05	-1.5

Involved

ProjectId	ExperimentId	InvolvedId	Login
1214	1	1	mlom
1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

2. How many fields in Person?

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

ProjectId	ProjectName
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Involved

ProjectId	ExperimentId	InvolvedId	Login
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1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

3. How many fields in Involved?

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

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1709	2	1	1891-02-23	7.2
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1737	2	2	1900-07-05	-1.5

Involved

ProjectId	ExperimentId	InvolvedId	Login
1214	1	1	mlom
1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

4. How many records in Project?

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

ProjectId	ProjectName
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Experiment

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1214	2	1	1889-11-01	14.3
1709	1	3	1891-01-22	7.0
1709	2	1	1891-02-23	7.2
1737	1	1	1900-07-05	-1.0
1737	2	2	1900-07-05	-1.5

Involved

ProjectId	ExperimentId	InvolvedId	Login
1214	1	1	mlom
1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

5. How many records in Person?

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

ProjectId	ProjectName
1214	Antigravity
1709	Teleportation
1737	Time Travel

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ProjectId	ExperimentId	NumInvolved	ExperimentDate	Hours
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1709	1	3	1891-01-22	7.0
1709	2	1	1891-02-23	7.2
1737	1	1	1900-07-05	-1.0
1737	2	2	1900-07-05	-1.5

Involved

ProjectId	ExperimentId	InvolvedId	Login
1214	1	1	mlom
1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

6. How many tables? What are their names?

Student

StudID	StudName	Age
1	Stan Dupp	15
2	Sarah Soda	16
3	Ida Knowe	15

Teacher

TeacherID	TName	DeptID
18	Al Beback	2002
20	Sid Down	2002
19	N. E. Body	2003

Department

ID	Name	Office
2002	Business	101
2003	Math	123

Course

Code	Credits	CName	PreReq
ICS3U0	1	Grade 11 Computer Programming	None
ICS4U0	1	Grade 12 Computer Programming	ICS3U0
HSB4M7	2	Integrated Technology in a Global Society	ICS208
ICS208	1	MYP Grade 10 Computer Programming	None

Registered

StudentID	SchedID
1	101
1	102
2	101
2	104
3	105
3	104
3	101
1	103
2	103
3	103

Schedule

SchedID	Term	Period	CourseCode	TeacherID	RoomNum
101	S2009	1	ICS208	20	133
102	S2010	2	ICS208	20	133
103	W2009	1	HSB4M7	18	107
104	S2010	3	ICS4U0	18	133
105	W2009	4	ICS3U0	19	105

7. How many fields in Student?

Student

StudID	StudName	Age
1	Stan Dupp	15
2	Sarah Soda	16
3	Ida Knowe	15

Teacher

TeacherID	TName	DeptID
18	Al Beback	2002
20	Sid Down	2002
19	N. E. Body	2003

Department

ID	Name	Office
2002	Business	101
2003	Math	123

Course

Code	Credits	CName	PreReq
ICS3U0	1	Grade 11 Computer Programming	None
ICS4U0	1	Grade 12 Computer Programming	ICS3U0
HSB4M7	2	Integrated Technology in a Global Society	ICS208
ICS208	1	MYP Grade 10 Computer Programming	None

Registered

StudentID	SchedID
1	101
1	102
2	101
2	104
3	105
3	104
3	101
1	103
2	103
3	103

Schedule

SchedID	Term	Period	CourseCode	TeacherID	RoomNum
101	S2009	1	ICS208	20	133
102	S2010	2	ICS208	20	133
103	W2009	1	HSB4M7	18	107
104	S2010	3	ICS4U0	18	133
105	W2009	4	ICS3U0	19	105

8. How many records in Course?

Student

StudID	StudName	Age
1	Stan Dupp	15
2	Sarah Soda	16
3	Ida Knowe	15

Teacher

TeacherID	TName	DeptID
18	Al Beback	2002
20	Sid Down	2002
19	N. E. Body	2003

Department

ID	Name	Office
2002	Business	101
2003	Math	123

Course

Code	Credits	CName	PreReq
ICS3U0	1	Grade 11 Computer Programming	None
ICS4U0	1	Grade 12 Computer Programming	ICS3U0
HSB4M7	2	Integrated Technology in a Global Society	ICS208
ICS208	1	MYP Grade 10 Computer Programming	None

Registered

StudentID	SchedID
1	101
1	102
2	101
2	104
3	105
3	104
3	101
1	103
2	103
3	103

Schedule

SchedID	Term	Period	CourseCode	TeacherID	RoomNum
101	S2009	1	ICS208	20	133
102	S2010	2	ICS208	20	133
103	W2009	1	HSB4M7	18	107
104	S2010	3	ICS4U0	18	133
105	W2009	4	ICS3U0	19	105

9. Who is in the math department?

Student

StudID	StudName	Age
1	Stan Dupp	15
2	Sarah Soda	16
3	Ida Knowe	15

Teacher

TeacherID	TName	DeptID
18	Al Beback	2002
20	Sid Down	2002
19	N. E. Body	2003

Department

ID	Name	Office
2002	Business	101
2003	Math	123

Course

Code	Credits	CName	PreReq
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ICS4U0	1	Grade 12 Computer Programming	ICS3U0
HSB4M7	2	Integrated Technology in a Global Society	ICS208
ICS208	1	MYP Grade 10 Computer Programming	None

Registered

StudentID	SchedID
1	101
1	102
2	101
2	104
3	105
3	104
3	101
1	103
2	103
3	103

Schedule

SchedID	Term	Period	CourseCode	TeacherID	RoomNum
101	S2009	1	ICS208	20	133
102	S2010	2	ICS208	20	133
103	W2009	1	HSB4M7	18	107
104	S2010	3	ICS4U0	18	133
105	W2009	4	ICS3U0	19	105

10. Who is 15 years old?

Student

StudID	StudName	Age
1	Stan Dupp	15
2	Sarah Soda	16
3	Ida Knowe	15

Teacher

TeacherID	TName	DeptID
18	Al Beback	2002
20	Sid Down	2002
19	N. E. Body	2003

Department

ID	Name	Office
2002	Business	101
2003	Math	123

Course

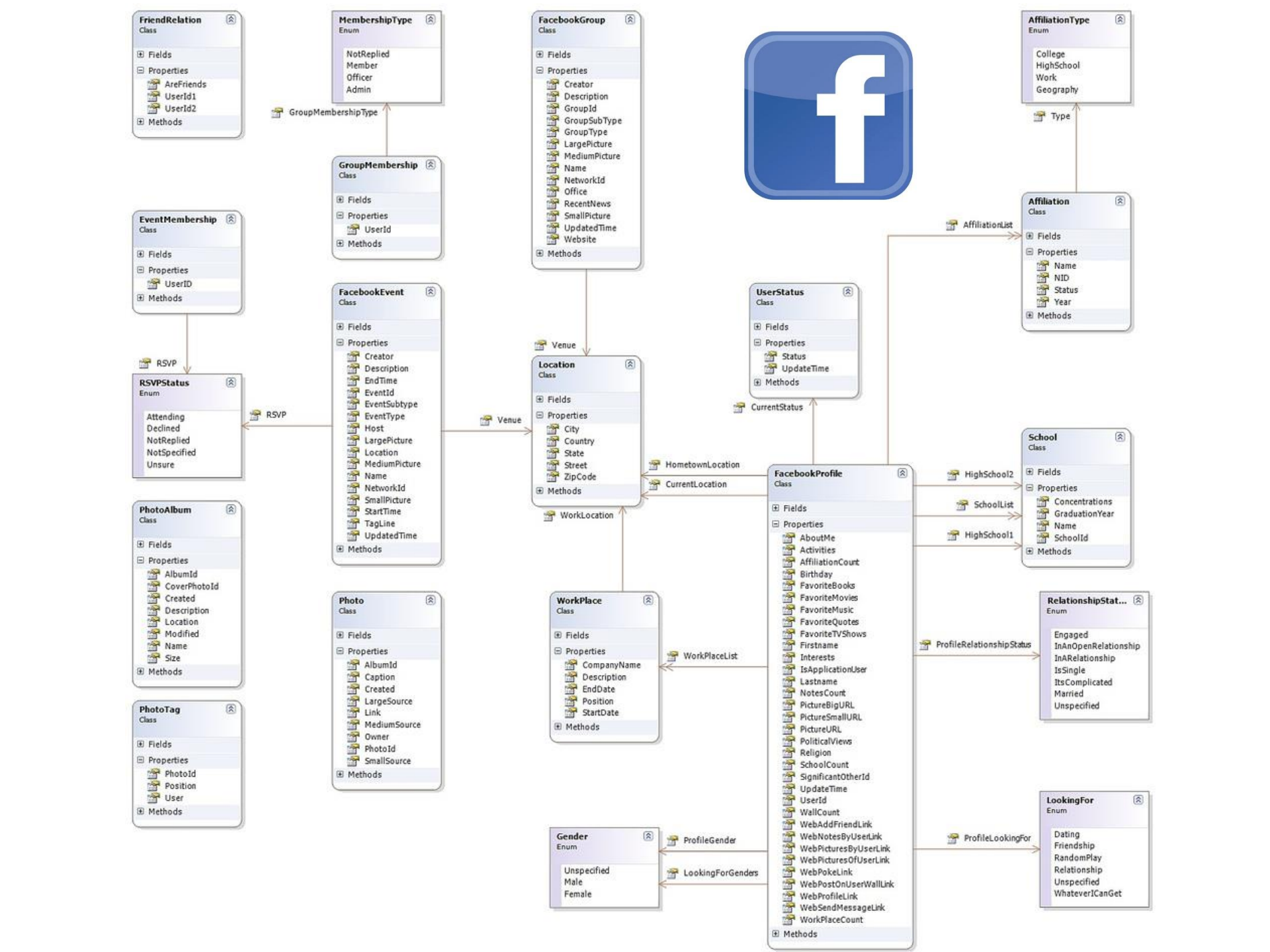
Code	Credits	CName	PreReq
ICS3U0	1	Grade 11 Computer Programming	None
ICS4U0	1	Grade 12 Computer Programming	ICS3U0
HSB4M7	2	Integrated Technology in a Global Society	ICS208
ICS208	1	MYP Grade 10 Computer Programming	None

Registered

StudentID	SchedID
1	101
1	102
2	101
2	104
3	105
3	104
3	101
1	103
2	103
3	103

Schedule

SchedID	Term	Period	CourseCode	TeacherID	RoomNum
101	S2009	1	ICS208	20	133
102	S2010	2	ICS208	20	133
103	W2009	1	HSB4M7	18	107
104	S2010	3	ICS4U0	18	133
105	W2009	4	ICS3U0	19	105


FriendRelation
Class
Fields
Properties
AreFriends
UserId1
UserId2
Methods
MembershipType
Enum
NotReplied
Member
Officer
Admin
GroupMembershipType
GroupMembership
Class
Fields
Properties
UserId
Methods
FacebookGroup
Class
Fields
Properties
Creator
Description
GroupId
GroupSubType
GroupType
LargePicture
MediumPicture
Name
NetworkId
Office
RecentNews
SmallPicture
UpdatedTime
Website
Methods
AffiliationType
Enum
College
HighSchool
Work
Geography
Type
Affiliation
Class
Fields
Properties
Name
NID
Status
Year
Methods
AffiliationList
EventMembership
Class
Fields
Properties
UserID
Methods
RSVP
RSVPStatus
Enum
Attending
Declined
NotReplied
NotSpecified
Unsure
RSVP
FacebookEvent
Class
Fields
Properties
Creator
Description
EndTime
EventId
EventSubtype
EventType
Host
LargePicture
Location
MediumPicture
Name
NetworkId
SmallPicture
StartTime
TagLine
UpdatedTime
Methods
Venue
Venue
Location
Class
Fields
Properties
City
Country
State
Street
ZipCode
Methods
WorkLocation
UserStatus
Class
Fields
Properties
Status
UpdateTime
Methods
CurrentStatus
HometownLocation
CurrentLocation
FacebookProfile
Class
Fields
Properties
AboutMe
Activities
AffiliationCount
Birthday
FavoriteBooks
FavoriteMovies
FavoriteMusic
FavoriteQuotes
FavoriteTVShows
Firstname
Interests
IsApplicationUser
Lastname
NotesCount
PictureBigURL
PictureSmallURL
PictureURL
PoliticalViews
Religion
SchoolCount
SignificantOtherId
UpdateTime
UserId
WallCount
WebAddFriendLink
WebNotesByUserLink
WebPicturesByUserLink
WebPicturesOfUserLink
WebPokeLink
WebPostOnUserWallLink
WebProfileLink
WebSendMessageLink
WorkPlaceCount
Methods
HighSchool2
SchoolList
HighSchool1
School
Class
Fields
Properties
Concentrations
GraduationYear
Name
SchoolId
Methods
PhotoAlbum
Class
Fields
Properties
AlbumId
CoverPhotoId
Created
Description
Location
Modified
Name
Size
Methods
Photo
Class
Fields
Properties
AlbumId
Caption
Created
LargeSource
Link
MediumSource
Owner
PhotoId
SmallSource
Methods
WorkPlace
Class
Fields
Properties
CompanyName
Description
EndDate
Position
StartDate
Methods
WorkPlaceList
RelationshipStat...
Enum
Engaged
InAnOpenRelationship
InARelationship
IsSingle
ItsComplicated
Married
Unspecified
ProfileRelationshipStatus
PhotoTag
Class
Fields
Properties
PhotoId
Position
User
Methods
Gender
Enum
Unspecified
Male
Female
ProfileGender
LookingForGenders
LookingFor
Enum
Dating
Friendship
RandomPlay
Relationship
Unspecified
Whatever1CanGet
ProfileLookingFor

What data types existed in Javascript (aka code.org)?

Num and Text

Access has a lot more….

Text	Ida	Knowe	459-	L4R 5T6
Number	34	24.5		
Currency	$192.89			
Link	www.gorskicopmsci.ca			
Date	12/19/2018	7:34 AM		
Image				

ID	CatName	MinAge	MaxAge	Cost
1	Swim A55	55	69	2.25
2	Swim Adult	18	54	2.75
3	Swim Child/Youth	0	13	2.00
4	Swim Member	0	200	0.00
5	Swim Privileged Senior	70	200	0.00
6	Swim Teen	14	17	2.25

ID	CatName	MinAge	MaxAge	Cost
1	Swim A55	55	69	2.25
2	Swim Adult	18	54	2.75
3	Swim Child/Youth	0	13	2.00
4	Swim Member	0	200	0.00
5	Swim Privileged Senior	70	200	0.00
6	Swim Teen	14	17	2.25

Try #3 on 4.2 now to test your understanding.

3. Classify each piece of data with the most appropriate type.
(word bank: text, number, currency, link, date, image)

(a)	cat		(h)	235.3	
(b)	0.2344		(i)	Frogs are green.	
(c)	-89		(j)	www.bcss.com	
(d)	$56.34		(k)	(905) 451-4756	
(e)	K		(l)	Mon Dec 4, 2017	
(f)	L6V 4N2		(m)	💻 [a picture]	
(g)	12/2/2017		(n)	www.google.ca	