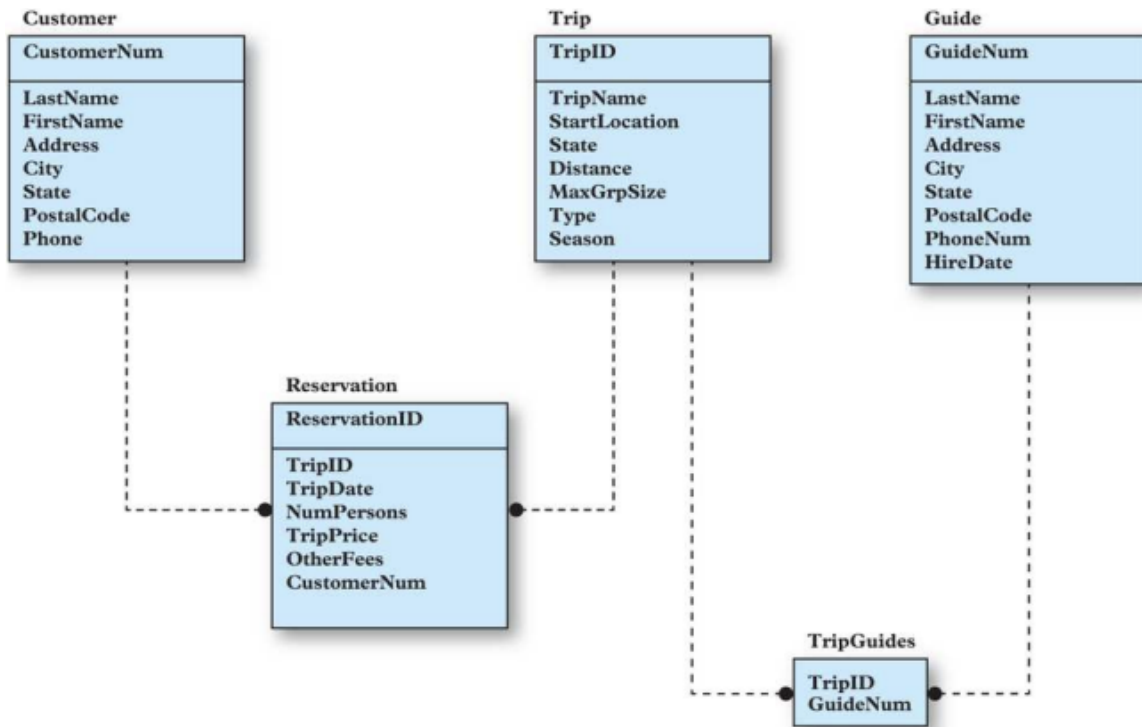- Colonial Adventure Tours

  - 작은 규모의 비즈니스

  - 동부 뉴잉글랜드지역 가이드 투어

  - 다음의 정보를 데이터 베이스에 저장한다.

    - Guides

    - Trips

    - Customers

    - Reservations

  - Q & A

    - 고객과 예약간의 관계를 이해하기 위해 다음의 질문에 답하라

    - 어떤 고객이 (예약번호) 1600010을 예약했는가

      - Resrvation에 해당하는 번호를 찾고, CustomerNum을 기억한뒤 Customer 테이블에 해당하는 번호의 이름을 출력한다.

    - Karen Busa는 어떠한 날에 예약이 있는가?

    - 각각의 E-R 다이어 그램은?

      - Customer - Reservation → 1 to many

      - Reservation - Trip → many tp 1

      - Guide - Trip → many to many 이것은 안된다.

        - Guide - *TripGuide → 1 to many

        - *TripGuide - Trip → many to 1

        - 이경우 TripGuide는 두개의 프라이빗 키를 가지게 된다. (매핑 테이블), Composite Primary Key

    - 어떤 여행들이 Susan Kiley에 의해 리드되어 지는가?

- 어떤 가이드들이 Lower Pond Trip을 리드하는가?

- Jean Luc Carson의 친구 한 명이 Tour Office에전화를 걸어 같은 여행을 예약하고 싶다고한다. 그러나 친구가 여행의 이름을 기억하지못한다. Jean이 예약한 여행의 이름은?

- 어떤 가이드가 Summer시즌에 Paddling여행을가이드 하는가?

- Colonial Adventure Tours의 E-R diagram을그려보시오

Customer

CustomerNum
LastName FirstName Address City State PostalCode Phone

Trip

TripID
TripName StartLocation State Distance MaxGrpSize Type Season

Guide

GuideNum
LastName FirstName Address City State PostalCode PhoneNum HireDate

Reservation

ReservationID
TripID TripDate NumPersons TripPrice OtherFees CustomerNum

TripGuides

TripID GuideNum

Guide

GuideNum	LastName	FirstName	Address	City	State	PostalCode	PhoneNum	HireDate
AM01	Abrams	Miles	54 Quest Ave.	Williamsburg	MA	01096	617-555-6032	6/3/2012
BR01	Boyers	Rita	140 Oakton Rd.	Jaffrey	NH	03452	603-555-2134	3/4/2012
DH01	Devon	Harley	25 Old Ranch Rd.	Sunderland	MA	01375	781-555-7767	1/8/2012
GZ01	Gregory	Zach	7 Moose Head Rd.	Dummer	NH	03588	603-555-8765	11/4/2012
KS01	Kiley	Susan	943 Oakton Rd.	Jaffrey	NH	03452	603-555-1230	4/8/2013
KS02	Kelly	Sam	9 Congaree Ave.	Fraconia	NH	03580	603-555-0003	6/10/2013
MR01	Marston	Ray	24 Shenandoah Rd.	Springfield	MA	01101	781-555-2323	9/14/2015
RH01	Rowan	Hal	12 Heather Rd.	Mount Desert	ME	04660	207-555-9009	6/2/2014
SL01	Stevens	Lori	15 Riverton Rd.	Coventry	VT	05825	802-555-3339	9/5/2014
UG01	Unser	Glory	342 Pineview St.	Danbury	CT	06810	203-555-8534	2/2/2015

Trip

TripID	TripName	StartLocation	State	Distance	MaxGrpSize	Type	Season
1	Arethusa Falls	Harts Location	NH	5	10	Hiking	Summer
2	Mt Ascutney - North Peak	Weathersfield	VT	5	6	Hiking	Late Spring
3	Mt Ascutney - West Peak	Weathersfield	VT	6	10	Hiking	Early Fall
4	Bradbury Mountain Ride	Lewiston-Auburn	ME	25	8	Biking	Early Fall
5	Baldpate Mountain	North Newry	ME	6	10	Hiking	Late Spring
6	Blueberry Mountain	Batchelders Grant	ME	8	8	Hiking	Early Fall
7	Bloomfield - Maidstone	Bloomfield	CT	10	6	Paddling	Late Spring
8	Black Pond	Lincoln	NH	8	12	Hiking	Summer
9	Big Rock Cave	Tamworth	NH	6	10	Hiking	Summer
10	Mt. Cardigan - Firescrew	Orange	NH	7	8	Hiking	Summer
11	Chocorua Lake Tour	Tamworth	NH	12	15	Paddling	Summer
12	Cadillac Mountain Ride	Bar Harbor	ME	8	16	Biking	Early Fall
13	Cadillac Mountain	Bar Harbor	ME	7	8	Hiking	Late Spring
14	Cannon Mtn	Franconia	NH	6	6	Hiking	Early Fall
15	Crawford Path Presidentials Hike	Crawford Notch	NH	16	4	Hiking	Summer
16	Cherry Pond	Whitefield	NH	6	16	Hiking	Spring
17	Huguenot Head Hike	Bar Harbor	ME	5	10	Hiking	Early Fall
18	Low Bald Spot Hike	Pinkam Notch	NH	8	6	Hiking	Early Fall
19	Mason's Farm	North Stratford	CT	12	7	Paddling	Late Spring
20	Lake Mephremagog Tour	Newport	VT	8	15	Paddling	Late Spring
21	Long Pond	Rutland	MA	8	12	Hiking	Summer
22	Long Pond Tour	Greenville	ME	12	10	Paddling	Summer
23	Lower Pond Tour	Poland	ME	8	15	Paddling	Late Spring
24	Mt Adams	Randolph	NH	9	6	Hiking	Summer
25	Mount Battie Ride	Camden	ME	20	8	Biking	Early Fall
26	Mount Cardigan Hike	Cardigan	NH	4	16	Hiking	Late Fall
27	Mt. Chocorua	Albany	NH	6	10	Hiking	Spring
28	Mount Garfield Hike	Woodstock	NH	5	10	Hiking	Early Fall
29	Metacomet-Monadnock Trail Hike	Pelham	MA	10	12	Hiking	Late Spring
30	McLennan Reservation Hike	Tyringham	MA	6	16	Hiking	Summer
31	Missisquoi River - VT	Lowell	VT	12	10	Paddling	Summer
32	Northern Forest Canoe Trail	Stark	NH	15	10	Paddling	Summer
33	Park Loop Ride	Mount Desert Island	ME	27	8	Biking	Late Spring
34	Pontook Reservoir Tour	Dummer	NH	15	14	Paddling	Late Spring
35	Pisgah State Park Ride	Northborough	NH	12	10	Biking	Summer
36	Pondicherry Trail Ride	White Mountains	NH	15	16	Biking	Late Spring
37	Seal Beach Harbor	Bar Harbor	ME	5	16	Hiking	Early Spring
38	Sawyer River Ride	Mount Carrigain	NH	10	18	Biking	Early Fall
39	Welch and Dickey Mountains Hike	Thorton	NH	5	10	Hiking	Summer
40	Wachusett Mountain	Princeton	MA	8	8	Hiking	Early Spring
41	Westfield River Loop	Fort Fairfield	ME	20	10	Biking	Late Spring

Customer

CustomerNum	LastName	FirstName	Address	City	State	PostalCode	Phone
101	Northfold	Liam	9 Old Mill Rd.	Londonderry	NH	03053	603-555-7563
102	Ocean	Arnold	2332 South St. Apt 3	Springfield	MA	01101	413-555-3212
103	Kasuma	Sujata	132 Main St. #1	East Hartford	CT	06108	860-555-0703
104	Goff	Ryan	164A South Bend Rd.	Lowell	MA	01854	781-555-8423
105	McLean	Kyle	345 Lower Ave.	Wolcott	NY	14590	585-555-5321
106	Morontoia	Joseph	156 Scholar St.	Johnston	RI	02919	401-555-4848
107	Marchand	Quinn	76 Cross Rd.	Bath	NH	03740	603-555-0456
108	Rulf	Uschi	32 Sheep Stop St.	Edinboro	PA	16412	814-555-5521
109	Caron	Jean Luc	10 Greenfield St.	Rome	ME	04963	207-555-9643
110	Bers	Martha	65 Granite St.	York	NY	14592	585-555-0111
112	Jones	Laura	373 Highland Ave.	Somerville	MA	02143	857-555-6258
115	Vaccari	Adam	1282 Ocean Walk	Ocean City	NJ	08226	609-555-5231
116	Murakami	Iris	7 Cherry Blossom St.	Weymouth	MA	02188	617-555-6665
119	Chau	Clement	18 Ark Ledge Ln.	Londonderry	VT	05148	802-555-3096
120	Gernowski	Sadie	24 Stump Rd.	Athens	ME	04912	207-555-4507
121	Bretton-Borak	Siam	10 Old Main St.	Cambridge	VT	05444	802-555-3443
122	Hefferson	Orlauh	132 South St. Apt 27	Manchester	NH	03101	603-555-3476
123	Barnett	Larry	25 Stag Rd.	Fairfield	CT	06824	860-555-9876
124	Busa	Karen	12 Foster St.	South Windsor	CT	06074	857-555-5532
125	Peterson	Becca	51 Fredrick St.	Albion	NY	14411	585-555-0900
126	Brown	Brianne	154 Central St.	Vernon	CT	06066	860-555-3234

Reservation

ReservationID	TripID	TripDate	NumPersons	TripPrice	OtherFees	CustomerNum
1600001	40	3/26/2016	2	$55.00	$0.00	101
1600002	21	6/8/2016	2	$95.00	$0.00	101
1600003	28	9/12/2016	1	$35.00	$0.00	103
1600004	26	10/16/2016	4	$45.00	$15.00	104
1600005	39	6/25/2016	5	$55.00	$0.00	105
1600006	32	6/18/2016	1	$80.00	$20.00	106
1600007	22	7/9/2016	8	$75.00	$10.00	107
1600008	28	9/12/2016	2	$35.00	$0.00	108
1600009	38	9/11/2016	2	$90.00	$40.00	109
1600010	2	5/14/2016	3	$25.00	$0.00	102
1600011	3	9/15/2016	3	$25.00	$0.00	102
1600012	1	6/12/2016	4	$15.00	$0.00	115
1600013	8	7/9/2016	1	$20.00	$5.00	116
1600014	12	10/1/2016	2	$40.00	$5.00	119
1600015	10	7/23/2016	1	$20.00	$0.00	120
1600016	11	7/23/2016	6	$75.00	$15.00	121
1600017	39	6/18/2016	3	$20.00	$5.00	122
1600018	38	9/18/2016	4	$85.00	$15.00	126
1600019	25	8/29/2016	2	$110.00	$25.00	124
1600020	28	8/27/2016	2	$35.00	$10.00	124
1600021	32	6/11/2016	3	$90.00	$20.00	112
1600022	21	6/8/2016	1	$95.00	$25.00	119
1600024	38	9/11/2016	1	$70.00	$30.00	121
1600025	38	9/11/2016	2	$70.00	$45.00	125
1600026	12	10/1/2016	2	$40.00	$0.00	126
1600029	4	9/19/2016	4	$105.00	$25.00	120
1600030	15	7/25/2016	6	$60.00	$15.00	104

- Solmaris Condominium Group manages condominium complexes

  - Located in Florida

  - Two locations : Solmaris Ocean and Solmaris Bayside

  - Maintains common areas and provides maintenance services

- Database used to store data

  - 소유주와 콘도유닛간의 관계를 이해하기위해다음의 질문에 답해봅시다

    - 누가 405 유닛을 소유하고 있는가?

    - Bill Anderson은 어떠한 유닛을 소유하고있는가?

    - 서비스 요청과 콘도유닛간의 관계를 이해하기위해 다음의 질문에 답해봅시다

    - 부엌에 화재가 있었던 유닛은 어디인가?
      그리고 누가 이 유닛을 소유하고 있는가?

- 콘도 유닛 204는 어떠한 카테고리의 서비스를요청했는가?
  Solmaris Condominium의 E-R diagram을그려보시오

Location
LocationNum
LocationName
Address
City
State
PostalCode

Owner
OwnerNum
LastName
FirstName
Address
City
State
PostalCode

ServiceCategory
CategoryNum
CategoryDescription

CondoUnit
CondoID
LocationNum
UnitNum
SqrFt
Bdrms
Baths
CondoFee
OwnerNum

ServiceRequest
ServiceID
CondoID
CategoryNum
Description
Status
EstHours
SpentHours
NextServiceDate
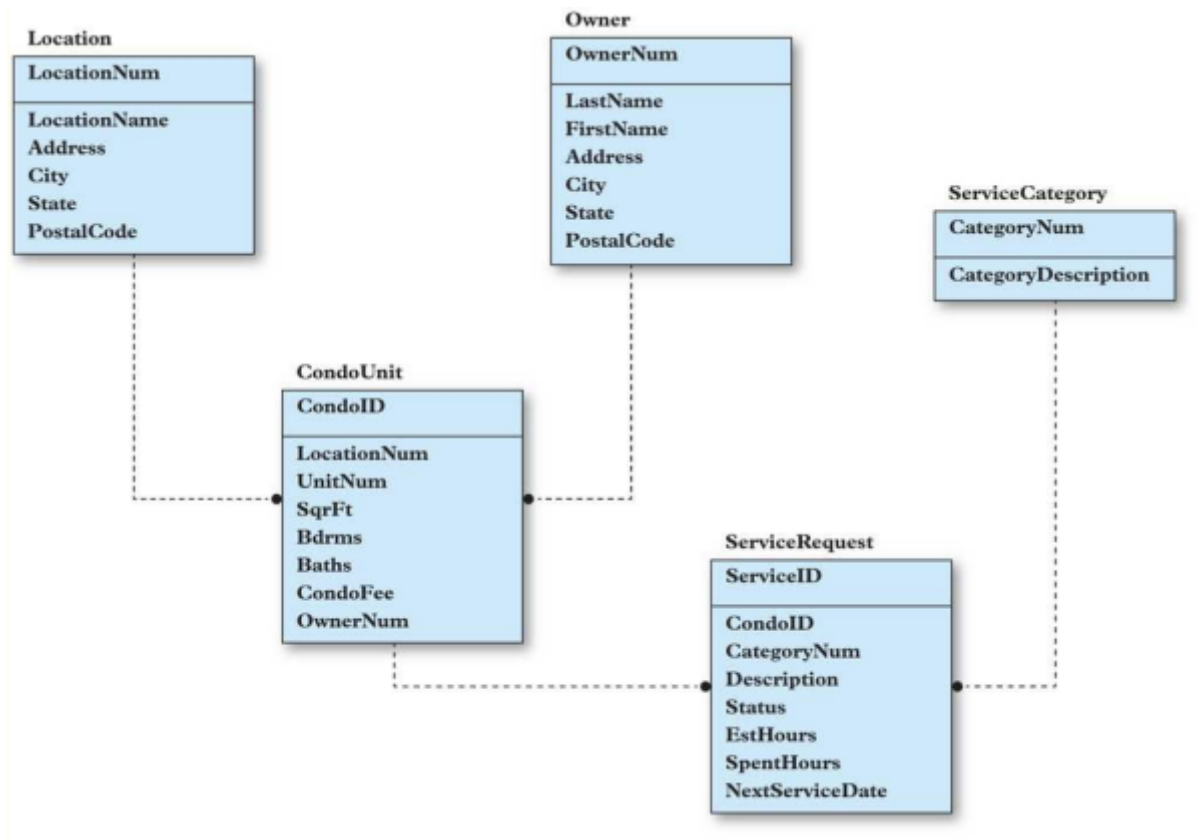
Location

LocationNum	LocationName	Address	City	State	PostalCode
1	Solmaris Ocean	100 Ocean Ave.	Bowton	FL	31313
2	Solmaris Bayside	405 Bayside Blvd.	Glander Bay	FL	31044

Owner

OwnerNum	LastName	FirstName	Address	City	State	PostalCode
AD057	Adney	Bruce and Jean	100 Ocean Ave.	Bowton	FL	31313
AN175	Anderson	Bill	18 Wilcox St.	Brunswick	GA	31522
BL720	Blake	Jack	2672 Condor St.	Mills	SC	29707
EL025	Elend	Bill and Sandy	100 Ocean Ave.	Bowton	FL	31313
FE182	Feenstra	Daniel	7822 Coventry Dr.	Rivard	FL	31062
JU092	Juarez	Maria	892 Oak St.	Kaleva	FL	31521
KE122	Kelly	Alyssa	527 Waters St.	Norton	MI	49441
NO225	Norton	Peter and Caitlin	281 Lakewood Ave.	Lawndale	PA	19111
RO123	Robinson	Mike and Jane	900 Spring Lake Dr.	Springs	MI	49456
SM072	Smeltz	Jim and Cathy	922 Garland Dr.	Lewiston	FL	32765
TR222	Trent	Michael	405 Bayside Blvd.	Glander Bay	FL	31044
WS032	Wilson	Henry and Karen	25 Nichols St.	Lewiston	FL	32765

CondoUnit

CondoID	LocationNum	UnitNum	SqrFt	Bdrms	Baths	CondoFee	OwnerNum
1	1	102	675	1	1	$475	AD057
2	1	201	1,030	2	1	$550	EL025
3	1	306	1,575	3	2	$625	AN175
4	1	204	1,164	2	2	$575	BL720
5	1	405	1,575	3	2	$625	FE182
6	1	401	1,030	2	2	$550	KE122
7	1	502	745	1	1	$490	JU092
8	1	503	1,680	3	3	$670	RO123
9	2	A03	725	1	1	$190	TR222
10	2	A01	1,084	2	1	$235	NO225
11	2	B01	1,084	2	2	$250	SM072
12	2	C01	750	1	1	$190	AN175
13	2	C02	1,245	2	2	$250	WS032
14	2	C06	1,540	3	2	$300	RO123

ServiceCategory

CategoryNum	CategoryDescription
1	Plumbing
2	Heating/Air Conditioning
3	Painting
4	Electrical Systems
5	Carpentry
6	Janitorial

ServiceRequest

Service ID	Condo ID	Category Num	Description	Status	Est Hours	Spent Hours	Next ServiceDate
1	2	1	Back wall in pantry has mold indicating water seepage. Diagnose and repair.	Service rep has verified the problem. Plumbing contractor has been called.	4	2	10/12/2015
2	5	2	Air conditioning doesn't cool.	Service rep has verified problem. Air conditioning contractor has been called.	3	1	10/12/2015
3	4	6	Hardwood floors must be refinished.	Service call has been scheduled.	8	0	10/16/2015
4	1	4	Switches in kitchen and adjoining dining room are reversed.	Open	1	0	10/13/2015
5	2	5	Molding in pantry must be replaced.	Cannot schedule until water leak is corrected.	2	0	
6	14	3	Unit needs to be repainted due to previous tenant damage.	Scheduled	7	0	10/19/2015
7	11	4	Tenant complained that using microwave caused short circuits on two occasions.	Service rep unable to duplicate problem. Tenant to notify condo management if problem recurs.	1	1	
8	9	3	Kitchen must be repainted. Walls discolored due to kitchen fire.	Scheduled	5	0	10/16/2015
9	7	6	Shampoo all carpets.	Open	5	0	10/19/2015
10	9	5	Repair window sills.	Scheduled	4	0	10/20/2015

- 데이터 관리에 있어서 NonDatabase Approach의 문제점

  - Redundancy

  - Difficulties

  - Accessing related data

  - Limited security features

  - Limited data Sharing features

  - And potential size limitations

- Entity

  - Person

  - Place

- Object

- Event

- Or idea for which you want to store and process data

- Attribute, field, or column

  - characteristic or property of an entity

- Relationship

  - an association between entities

- One-to-many Relationship

  - each occurrence of first entity is related to many occurrences of the second entity and each occurrence of the second entity is related to only one occurrence of the first entity

- Database

  - structure that can store information about multiple types of entities, attributes of entities, and relationships among entities

- TAL Distributors

  - requires information about reps, customers, items, orders, and order lines

- Entity-relationship (E-R) diagram

  - represents a database visually by using various symbols

- Database management system (DBMS)

  - program through which users interact with a database lets you create forms and reports quickly and easily and obtain answers to questions about the data

- Advantages of database processing

  - getting more information from the same amount of data, sharing data, balancing conflicting requirements, controlling redundancy, facilitating consistency, improving integrity, expanding security, increasing productivity, and providing data independence

- Disadvantages of database processing

  - larger file size, increased complexity, greater impact of failure, and more difficult recovery

- Colonial Adventure Tours needs to store information about
  - guides, trips, customers, and reservations
- Solmaris Condominium Group needs to store information about
  - condo locations, owners, condo units, service categories, and service requests
- Relation
  - two-dimensional table
    - 각각의 셀의 입력 값은 하나야 한다.
    - 각각의 컬럼은 각기 다른 이름이어야 한다.
    - 한 컬럼의 값들은 모두 같은 속성의 값들이다
    - 컬럼들의 순서는 중요하지 않다.
    - 각 행은 다르다
    - 행들의 순서는 중요하지 않다.
- Relational Database
  - Relation들의 집합체
  - 테이블의 각 Cell에는 하나의 값만 허용한다.
- Unnormalized Relation
  - 하나 이상의 값을 가질 때
  - 각각의 컬럼은 각기 다른 이름이어야 한다.
  - 한 컬럼의 값들은 모두 같은 속성의 값들이다
  - 컬럼들의 순서는 중요하지 않다.
  - 각 행은 다르다
  - 행들의 순서는 중요하지 않다.

- Relation Model
- QBE Query By Example
  - MS Access를 말하는 것과 같다.
  - 유저 친화적으로 만들어졌기 때문.

- - what is criteria?
- Relation Algebra