Cloud Database Management Project

IST 659 Database Administration Concepts and Database Management

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Business Problem

"It's well understood that using the cloud is necessary to stay competitive, the question is when should we move our workload to the cloud?"

What is Cloud Migration & why are more businesses moving to the cloud??

Cloud migration is a way to manage data across cloud platforms, either with or instead of on-premises storage. The cloud is useful as a data storage tier for disaster recovery, backup and long-term archiving. Cloud offers several benefits:

- The cloud offers better insights from big data.
- The cloud is flexible & scalable.
- The cloud drives collaboration efficiency.
- The cloud ensures business continuity and disaster recovery
- Cloud is simple & cost-effective.

Why we selected this project ?

Through this project we aim to answer the following questions:

- What major companies have migrated to Cloud service from a traditional database?
- Which industry sectors have adopted Cloud services the most?
- After migrating to the cloud, which industry sector has seen the highest rate of growth?
- What type of cloud(multi, hybrid, single) is preferred by companies?
- What part of their budget are the companies allocating for cloud services?
- Which Cloud vendor is preferred by companies?

Conceptual Model

After getting an understanding of the problem we move towards the Analysis phase of DBLC. Here identify the entities, attributes and the relationship between these entities and represent the same in the form of an E-R diagram that represents the conceptual model of the database.

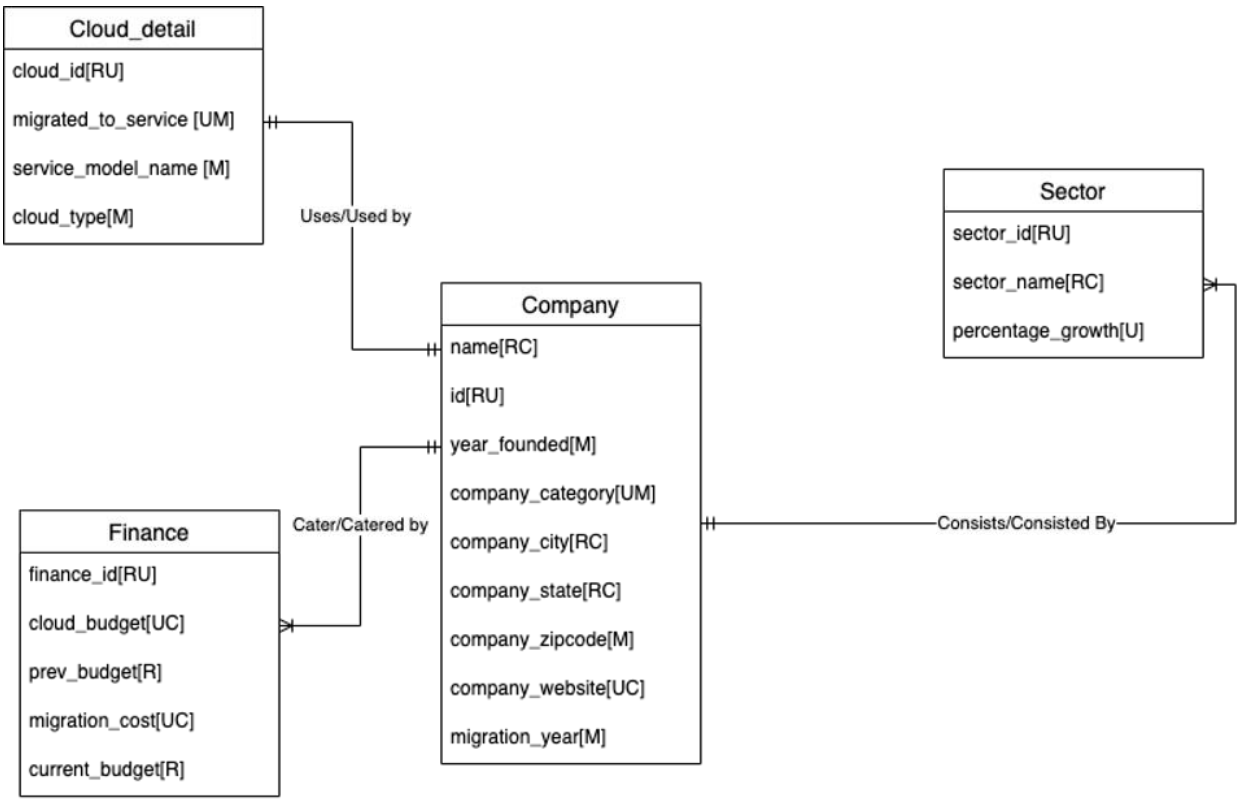
Data Entities - Company, Cloud detail, Finance, Sector

Data Attributes :

1. Company - Company name, website, year founded, city, state, zip code, website, migration year, company id
2. Cloud detail - id, migrated to service, cloud type, service model name
3. Sector - id, sector name, percentage growth
4. Finance - cloud budget, previous budget, migration cost, current budget

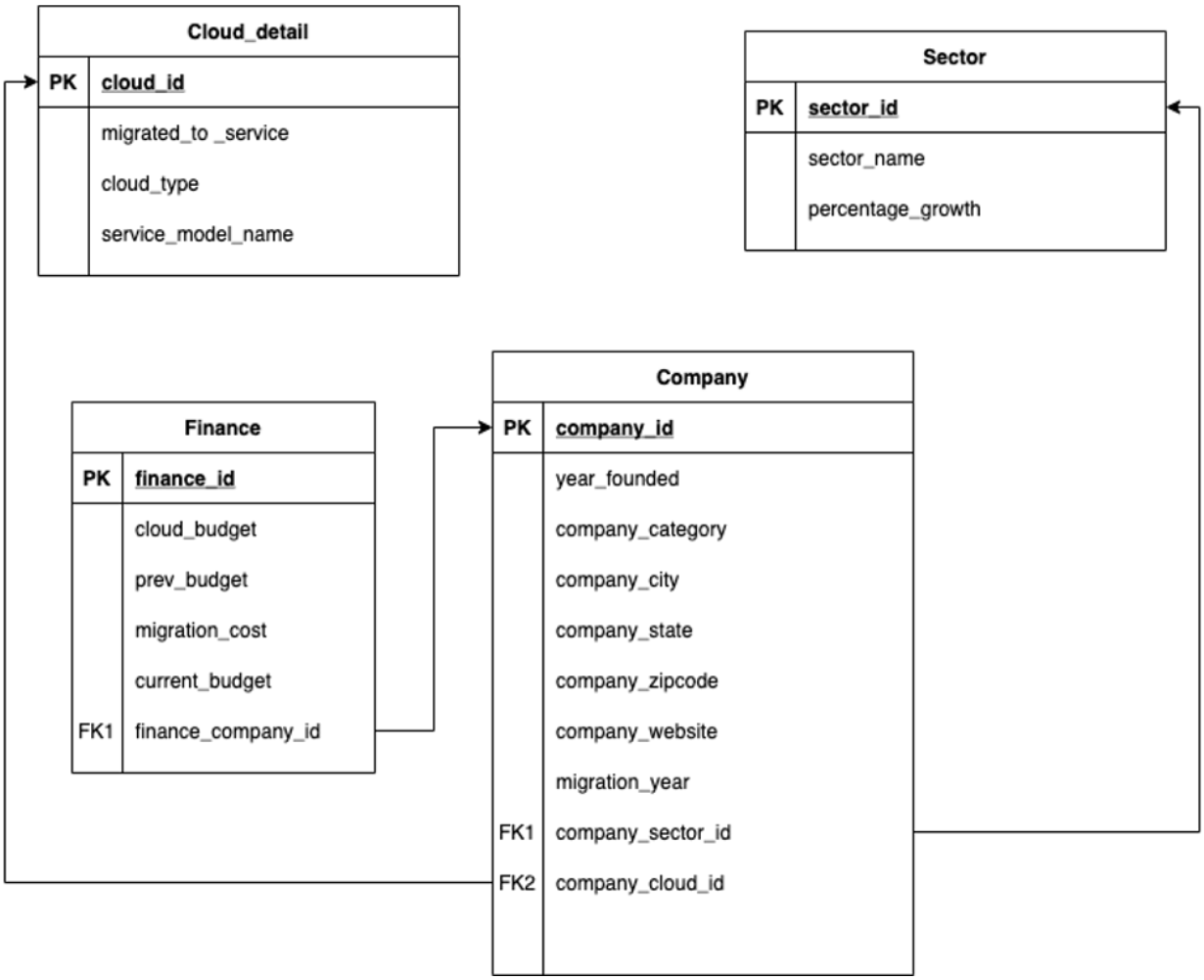
Entity relationships :

1. Company-Finance : One to many relationship
2. Company-Sector : One to many relationship
3. Company-Cloud detail : One to many relationship


Cloud_detail
cloud_id[RU]
migrated_to_service [UM]
service_model_name [M]
cloud_type[M]
Uses/Used by
Company
name[RC]
id[RU]
year_founded[M]
company_category[UM]
company_city[RC]
company_state[RC]
company_zipcode[M]
company_website[UC]
migration_year[M]
Sector
sector_id[RU]
sector_name[RC]
percentage_growth[U]
Consists/Consisted By
Finance
finance_id[RU]
cloud_budget[UC]
prev_budget[R]
migration_cost[UC]
current_budget[R]
Cater/Catered by

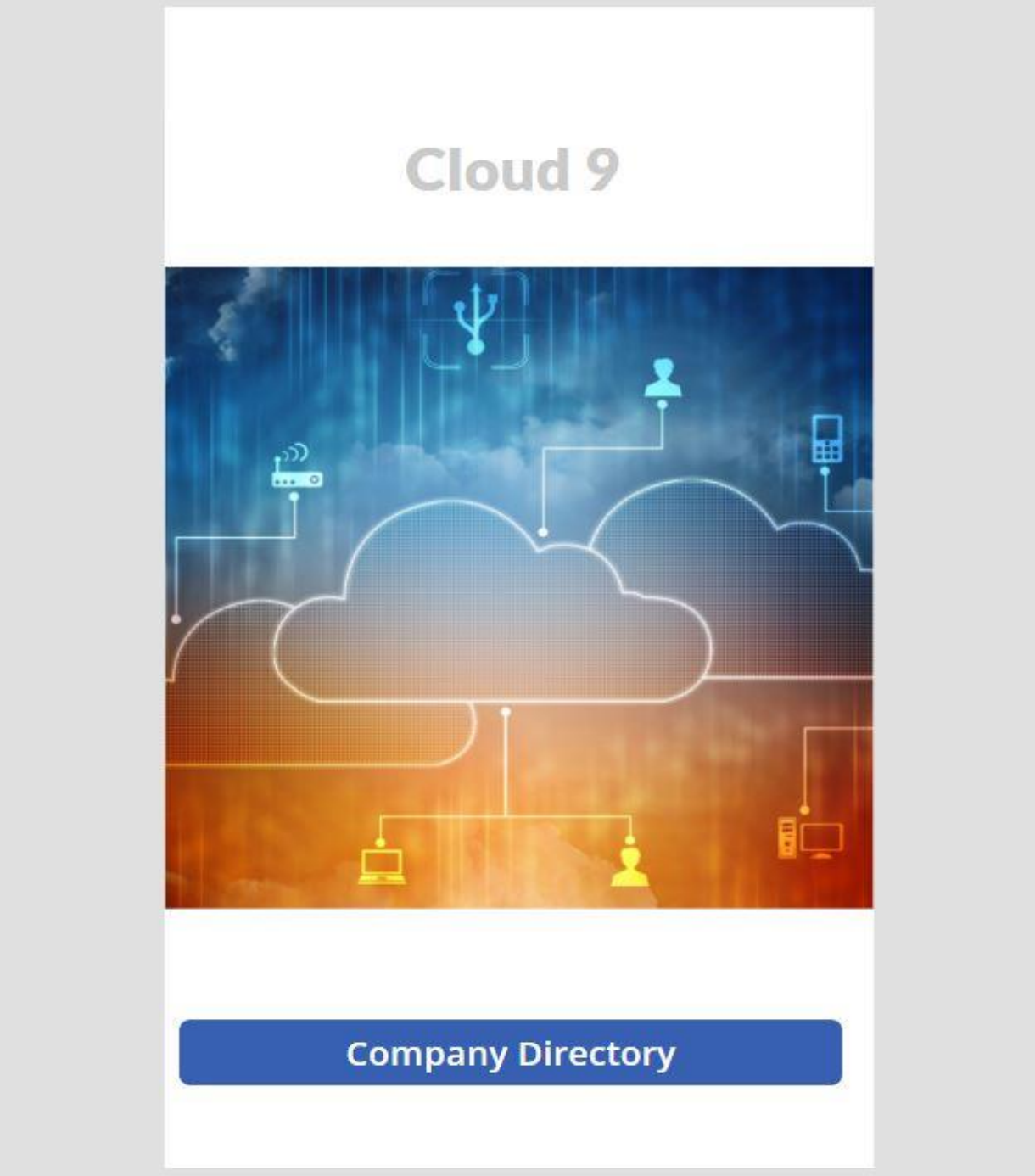
Logical Data Model

1. Company
    a. Primary Key: company_id
    b. Foreign keys: company_sector_id & company_cloud_id
2. Cloud_detail
    a. Primary Key: cloud_id
3. Sector
    a. Primary Key: sector_id
4. Finance
    a. Primary Key: finance_id
    b. Foreign Key: finance_company_id

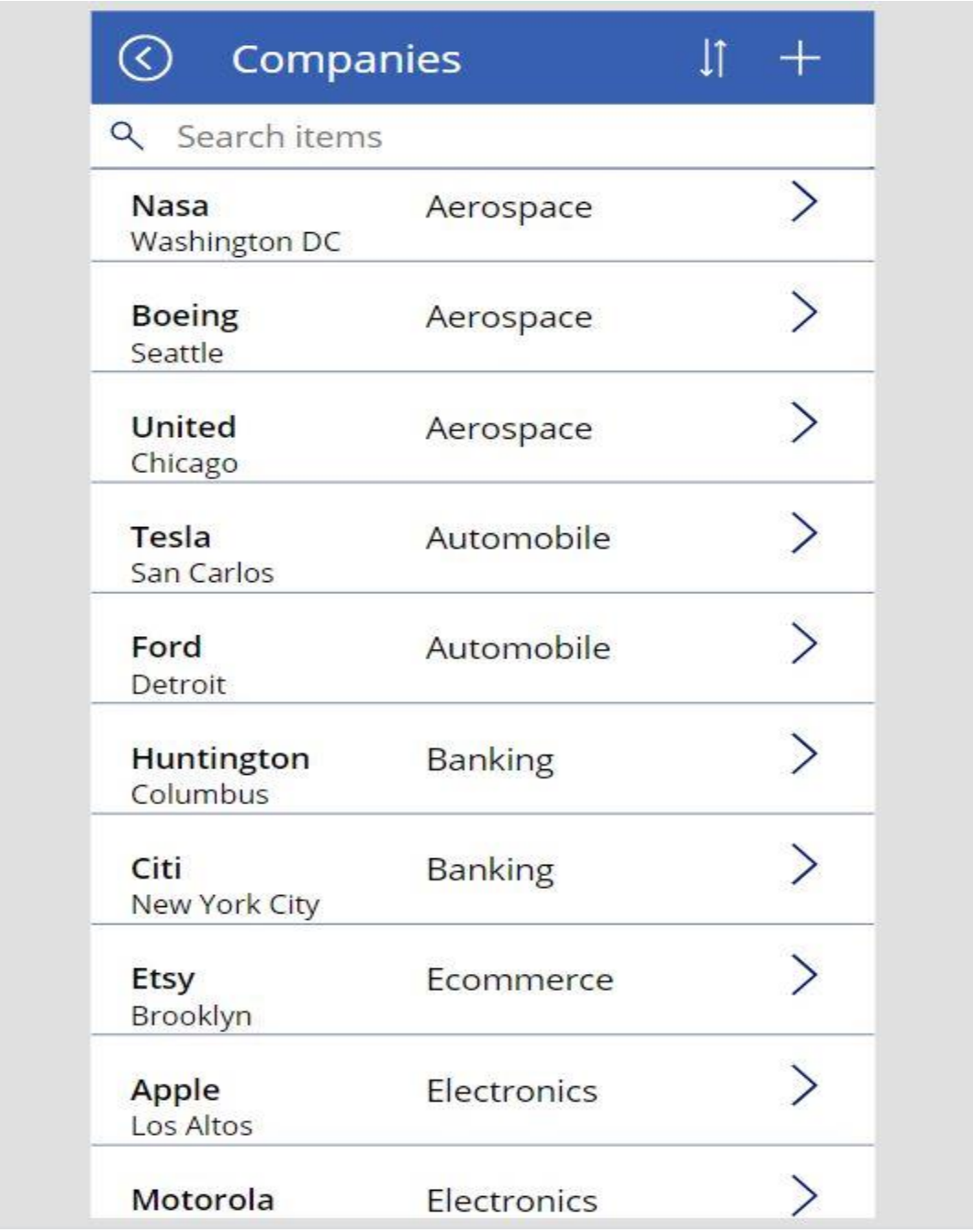


Application Screens

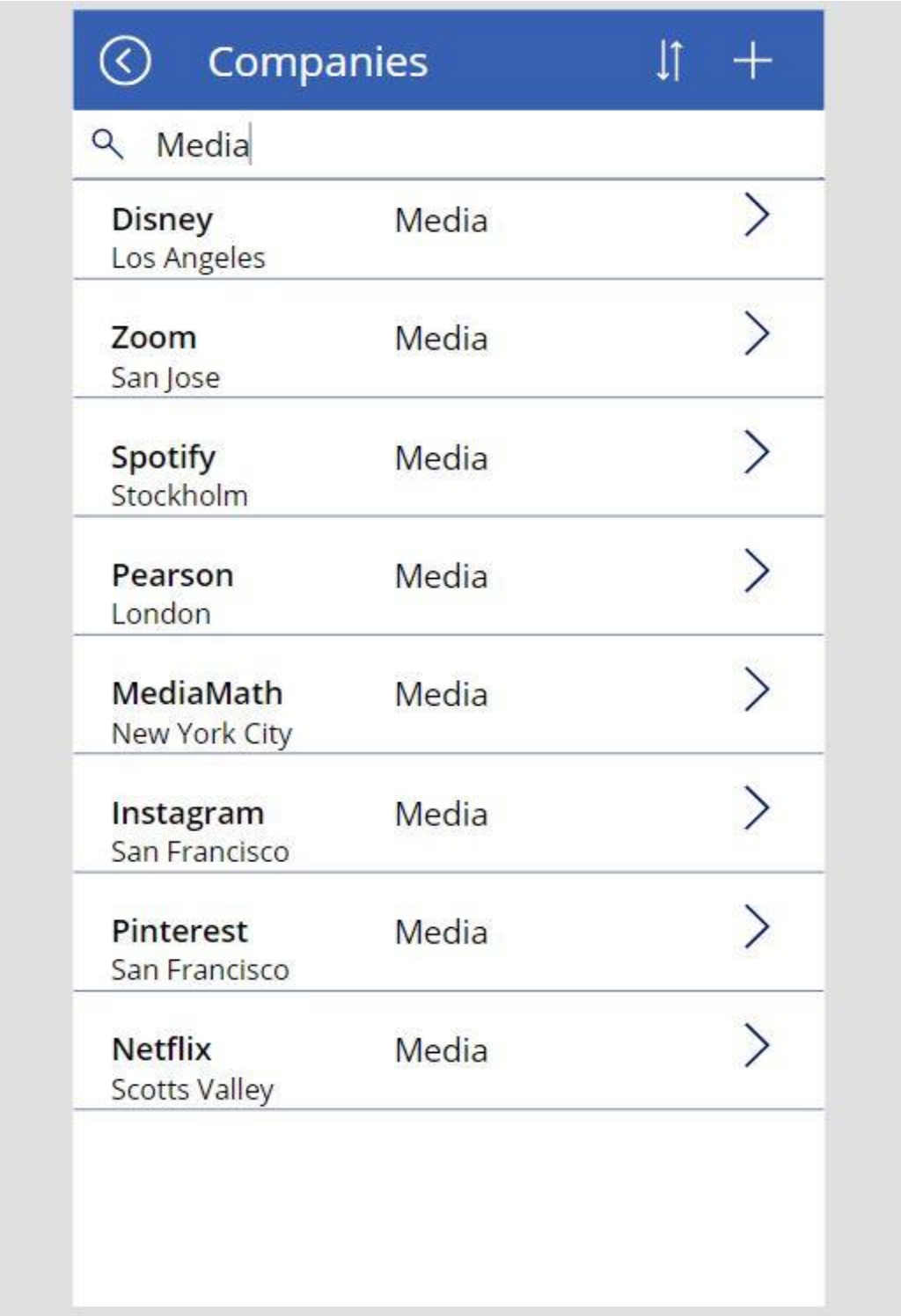
1) **Main Screen**



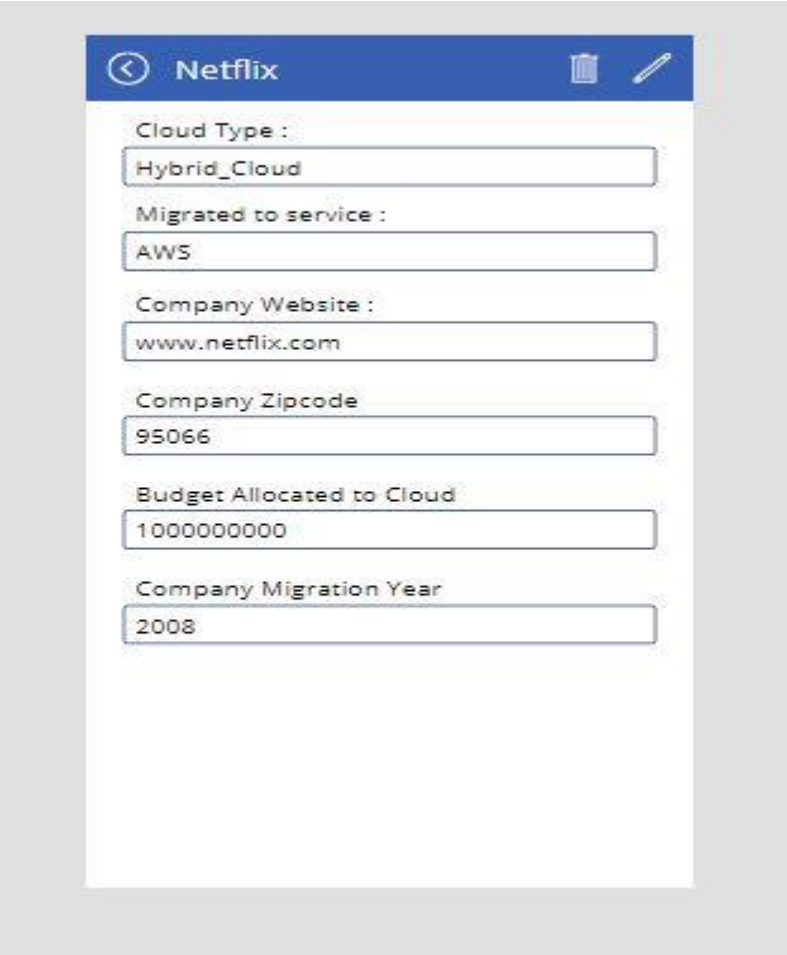
2) Companies List



3) Search based on company category



4) Company Details



5) Adding a Company which has recently moved to Cloud

SQL scripts

Up/Down Script

```
--DOWN
if exists (select * from INFORMATION_SCHEMA.TABLE_CONSTRAINTS where CONSTRAINT_NAME='fk_financess_finance_company_id')
    alter table finances drop constraint fk_financess_finance_company_id
 drop table if exists finances

if exists (select * from INFORMATION_SCHEMA.TABLE_CONSTRAINTS where CONSTRAINT_NAME='fk_companyys_cloud_id')
    alter table companyy drop CONSTRAINT fk_companyys_cloud_id, fk_companyys_sector_id
 drop table if exists companyy


drop table if exists sector_detail

drop table if exists cloud_details



--UP Metadata
GO
create table companyy(
    company_id int IDENTITY not null,
    company_name varchar(50) not null,
    company_year_founded int not null,
    company_category varchar(50) not null,
    company_city varchar(20) not null,
    company_state char(2) not null,
```

```
essages
4:41:06 PM      Started executing query at Line 7
                Commands completed successfully.
                Total execution time: 00:00:00.037
```

```
--UP Metadata
GO
create table companyy(
    company_id int IDENTITY not null,
    company_name varchar(50) not null,
    company_year_founded int not null,
    company_category varchar(50) not null,
    company_city varchar(20) not null,
    company_state char(2) not null,
    company_zipcode int not null,
    company_website varchar(50) not null,
    company_migration_year int not null,
    company_sector_id int not null,
    company_cloud_id int not null,
    CONSTRAINT pk_companys_company_id primary key(company_id),
    constraint u_companys_company_email UNIQUE(company_website),
 )
 GO

create table cloud_details(
    cloud_id int identity not null,
    migrated_to_service varchar(20) not null,
    cloud_type varchar(20) not null,
    service_model_name varchar(20) not null,
    CONSTRAINT pk_contractors_contractor_id primary key(cloud_id)
 )
 GO

create table sector_detail(
    sector_id int identity not null,
    sector_name varchar(50) not null,
    sector_percentage_growth float not null,
```

```
lessages
4:42:44 PM      Started executing query at Line 24
                Commands completed successfully.
4:42:44 PM      Started executing query at Line 26
                Commands completed successfully.
4:42:44 PM      Started executing query at Line 42
                Commands completed successfully.
4:42:44 PM      Started executing query at Line 51
                Commands completed successfully.
```

```
Ln 72, Col 1 (1527 selected)  Spaces: 4  UTF-8  CRLF  SQL  0 rows  MSSQL  00:00:00
```

Insert Queries

```
84
85
86  --- UP
87
88  Insert into cloud_details values ('AWS','Hybrid Cloud','IaaS')
89  Insert into cloud_details values ('AWS','Public Cloud','SaaS')
90  Insert into cloud_details values ('AWS','Private Cloud','IaaS')
91  Insert into cloud_details values ('Microsoft Azure','Hybrid Cloud','SaaS')
92  Insert into cloud_details values ('Microsoft Azure','Public Cloud','PaaS')
93  Insert into cloud_details values ('Microsoft Azure','Private Cloud','IaaS')
94  Insert into cloud_details values ('Google Cloud','Hybrid Cloud','SaaS')
95  Insert into cloud_details values ('Google Cloud','Public Cloud','PaaS')
96  Insert into cloud_details values ('Google Cloud','Private Cloud','IaaS')
97  Insert into cloud_details values ('IBM','Hybrid Cloud','PaaS')
98  Insert into cloud_details values ('IBM','Public Cloud','SaaS')
99  Insert into cloud_details values ('IBM','Private Cloud','IaaS')
100 Insert into cloud_details values ('Oracle','Hybrid Cloud','SaaS')
101 Insert into cloud_details values ('Oracle','Public Cloud','IaaS')
102 Insert into cloud_details values ('Oracle','Private Cloud','PaaS')
103
104
105 Insert into sector_detail values ('Media',10)
106 Insert into sector_detail values ('Technology',30.2)
107 Insert into sector_detail values ('Ecommerce',15.6)
108 Insert into sector_detail values ('Electronics',20.3)
109 Insert into sector_detail values ('Professional services',11)
110 Insert into sector_detail values ('Pharma',29)
111 Insert into sector_detail values ('Aerospace',9)
112 Insert into sector_detail values ('Products',17)
113 Insert into sector_detail values ('Automobile',7)
114 Insert into sector_detail values ('Retailer',22.4)
115 Insert into sector_detail values ('Service Provider',10)
116 Insert into sector_detail values ('Payment service',35)
117 Insert into sector_detail values ('Banking',12)
118 Insert into sector_detail values ('Food',27.8)
```

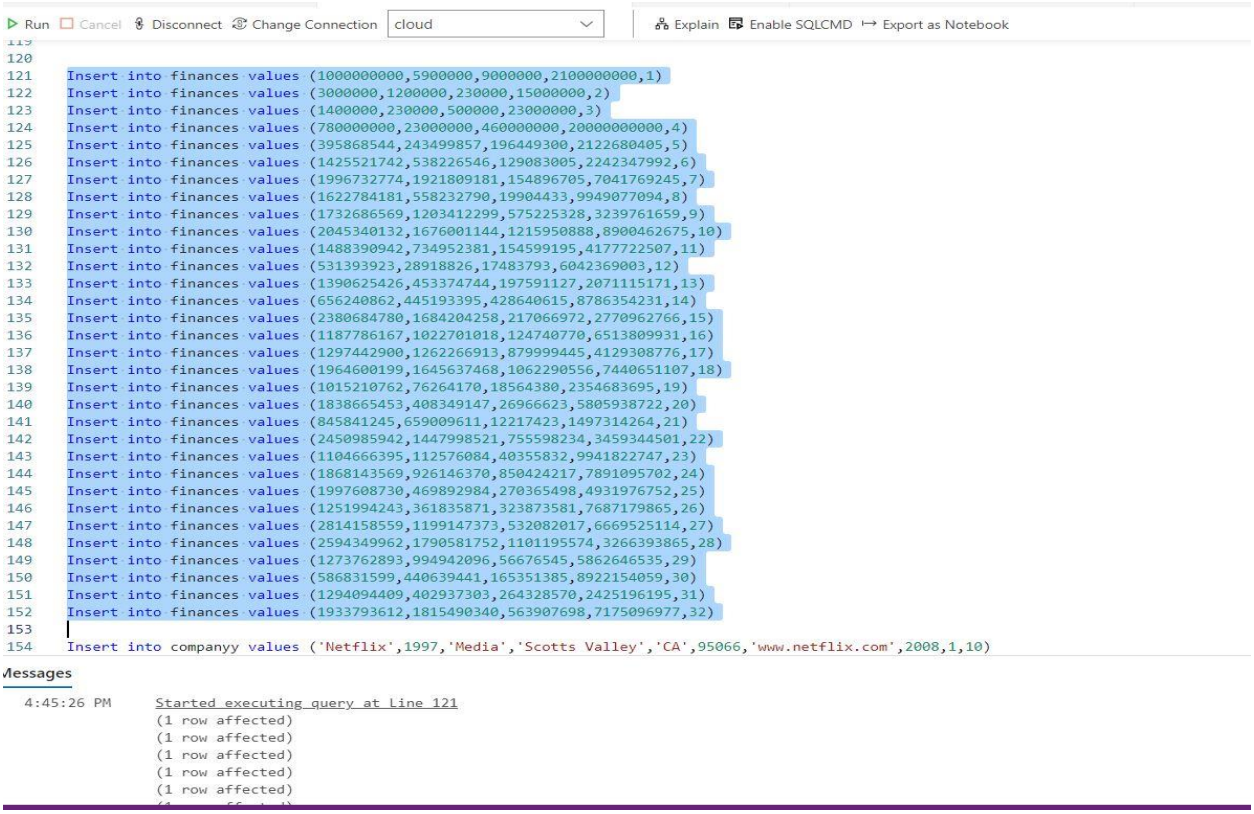
Messages

```
4:44:01 PM    Started executing query at Line 86
              (1 row affected)
              (1 row affected)
              (1 row affected)
              (1 row affected)
              (1 row affected)
```

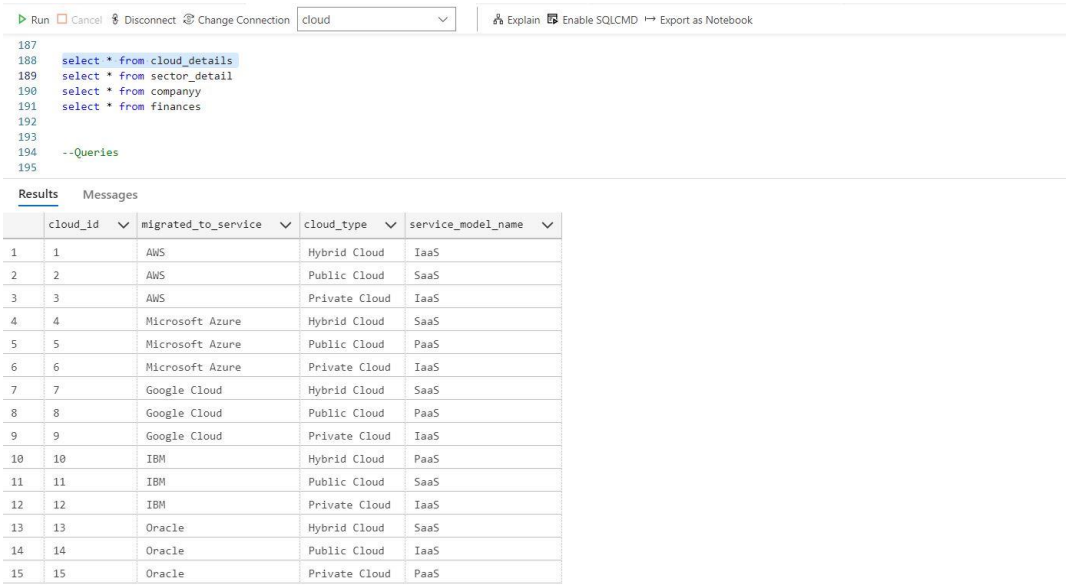
```
152 Insert into finances values (1955795812,1815496540,365967696,717509677,52)
153
154 Insert into companyy values ('Netflix',1997,'Media','Scotts Valley','CA',95066,'www.netflix.com',2008,1,10)
155 Insert into companyy values ('Xerox',1906,'Technology','Rochester','NY',14602,'www.xerox.com',2012,2,14)
156 Insert into companyy values ('Pinterest',2009,'Media','San Francisco','CA',94016,'www.pinterest.com',2017,11,9)
157 Insert into companyy values ('Instagram',2010,'Media','San Francisco','CA',94105,'www.instagram.com',2010,1,1)
158 Insert into companyy values ('Etsy',2005,'Ecommerce','Brooklyn','NY',11201,'www.etsy.com',2020,12,4)
159 Insert into companyy values ('Apple',1976,'Electronics','Los Altos','CA',94022,'www.apple.com',2016,4,7)
160 Insert into companyy values ('MediaMath',2007,'Media','New York City','NY',10008,'www.mediamath.com',2014,6,2)
161 Insert into companyy values ('Pearson',1998,'Media','London','UK',31642,'www.pearson.com',2012,1,12)
162 Insert into companyy values ('Deloitte',1845,'Professional services','London','UK',35203,'www.deloitte.com',2017,5,7)
163 Insert into companyy values ('Wipro',1945,'Professional services','Bengaluru','IN',560035,'www.wipro.com',2014,13,3)
164 Insert into companyy values ('Goldman Sachs',1869,'Professional services','New York City','NY',10001,'www.goldmansachs.com',2013,5,11)
165 Insert into companyy values ('Pfizer',1849,'Pharma','Brooklyn','NY',11208,'www.pfizer.com',2016,6,13)
166 Insert into companyy values ('Boeing',1916,'Aerospace','Seattle','WA',98124,'www.boeing.com',2011,7,8)
167 Insert into companyy values ('Nike',1964,'Products','Eugene','OR',97401,'www.nike.com',2017,8,3)
168 Insert into companyy values ('Dollar General',1939,'Retailer','Scottsville','KY',42164,'www.dollargeneral.com',2011,10,11)
169 Insert into companyy values ('Tesla',2003,'Automobile','San Carlos','CA',94070,'www.tesla.com',2012,9,1)
170 Insert into companyy values ('Nvidia',1993,'Technology','Santa Clara','CA',95050,'www.nvidia.com',2015,2,14)
171 Insert into companyy values ('United Airlines Holdings',1968,'Aerospace','Chicago','IL',60007,'www.unitedairlinesholdings.com',2010,7,9)
172 Insert into companyy values ('Nordstrom',1901,'Retailer','Seattle','WA',98101,'www.nordstrom.com',2013,10,5)
173 Insert into companyy values ('Uber Technologies',2009,'Service Provider','San Francisco','CA',94102,'www.uber.com',2019,11,8)
174 Insert into companyy values ('Ford',1903,'Automobile','Detroit','MI',48127,'www.ford.com',2018,9,2)
175 Insert into companyy values ('PayPal',1998,'Payment service','Palo Alto','CA',94020,'www.paypal.com',2016,12,15)
176 Insert into companyy values ('Spotify',2006,'Media','Stockholm','SW',10316,'www.spotify.com',2018,1,6)
177 Insert into companyy values ('Motorola',1928,'Electronics','Chicago','IL',60018,'www.motorola.com',2015,4,5)
178 Insert into companyy values ('Citi',1812,'Banking','New York City','NY',10004,'www.citi.com',2015,13,12)
179 Insert into companyy values ('Huntington',1866,'Banking','Columbus','OH',43004,'www.huntington.com',2016,13,13)
180 Insert into companyy values ('Whirpool',1911,'Electronics','Benton Harbor','MI',49022,'www.whirpool.com',2018,4,10)
181 Insert into companyy values ('Zoom',2011,'Media','San Jose','CA',94088,'www.zoom.com',2020,1,4)
182 Insert into companyy values ('Disney',1923,'Media','Los Angeles','CA',90001,'www.disney.com',2015,2,15)
183 Insert into companyy values ('Mcdonalds',1955,'Food','San Bernardino','CA',92401,'www.mcdonalds.com',2010,14,11)
184 Insert into companyy values ('Nasa',1958,'Aerospace','Washington DC','WA',20001,'www.nasa.com',2011,7,6)
185 Insert into companyy values ('Unilever',1929,'Products','London','UK',07632,'www.unilever.com',2012,8,3)
186
187
```

Messages

```
4:44:48 PM    Started executing query at Line 154
              (1 row affected)
              (1 row affected)
              (1 row affected)
              (1 row affected)
              (1 row affected)
```



Select Statement



	cloud_id	migrated_to_service	cloud_type	service_model_name
1	1	AWS	Hybrid Cloud	IaaS
2	2	AWS	Public Cloud	SaaS
3	3	AWS	Private Cloud	IaaS
4	4	Microsoft Azure	Hybrid Cloud	SaaS
5	5	Microsoft Azure	Public Cloud	PaaS
6	6	Microsoft Azure	Private Cloud	IaaS
7	7	Google Cloud	Hybrid Cloud	SaaS
8	8	Google Cloud	Public Cloud	PaaS
9	9	Google Cloud	Private Cloud	IaaS
10	10	IBM	Hybrid Cloud	PaaS
11	11	IBM	Public Cloud	SaaS
12	12	IBM	Private Cloud	IaaS
13	13	Oracle	Hybrid Cloud	SaaS
14	14	Oracle	Public Cloud	IaaS
15	15	Oracle	Private Cloud	PaaS

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
187
188   select * from cloud_details
189   select * from sector_detail
190   select * from companyy
191   select * from finances
192
193
194   --Queries
195
```

Results Messages

	sector_id	sector_name	sector_percentage_growth
1	1	Media	10
2	2	Technology	30.2
3	3	Ecommerce	15.6
4	4	Electronics	20.3
5	5	Professional services	11
6	6	Pharma	29
7	7	Aerospace	9
8	8	Products	17
9	9	Automobile	7
10	10	Retailer	22.4
11	11	Service Provider	10
12	12	Payment service	35
13	13	Banking	12
14	14	Food	27.8

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
184   Insert into companyy values ('Nasa',1958,'Aerospace','Washington DC','WA',20001,'www.nasa.com',2011,7,8)
185   Insert into companyy values ('Unilever',1929,'Products','London','UK',07632,'www.unilever.com',2012,8,3)
186
187
188   select * from cloud_details
189   select * from sector_detail
190   select * from companyy
191   select * from finances
192
193
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website
1	1	Netflix	1997	Media	Scotts Valley	CA	95066	www.netflix.com
2	2	Xerox	1906	Technology	Rochester	NY	14602	www.xerox.com
3	3	Pinterest	2009	Media	San Francisco	CA	94016	www.pinterest.com
4	4	Instagram	2010	Media	San Francisco	CA	94105	www.instagram.com
5	5	Etsy	2005	Ecommerce	Brooklyn	NY	11201	www.etsy.com
6	6	Apple	1976	Electronics	Los Altos	CA	94022	www.apple.com
7	7	MediaMath	2007	Media	New York City	NY	10008	www.mediamath.com
8	8	Pearson	1998	Media	London	UK	31642	www.pearson.com
9	9	Deloitte	1845	Professional services	London	UK	35203	www.deloitte.com
10	10	Wipro	1945	Professional services	Bengaluru	IN	560035	www.wipro.com
11	11	Goldman Sachs	1869	Professional services	New York City	NY	10001	www.goldmansachs.
12	12	Pfizer	1849	Pharma	Brooklyn	NY	11208	www.pfizer.com
13	13	Boeing	1916	Aerospace	Seattle	WA	98124	www.boeing.com
14	14	Nike	1964	Products	Eugene	OR	97401	www.nike.com
15	15	Dollar General	1939	Retailer	Scottsville	KY	42164	www.dollargeneral
16	16	Tesla	2003	Automobile	San Carlos	CA	94070	www.tesla.com
17	17	Nvidia	1993	Technology	Santa Clara	CA	95050	www.nvidia.com
18	18	United Airlines Holdings	1968	Aerospace	Chicago	IL	60007	www.unitedairline
19	19	Nordstrom	1901	Retailer	Seattle	WA	98101	www.nordstrom.com
20	20	Uber Technologies	2009	Service Provider	San Francisco	CA	94102	www.uber.com

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
187
188   select * from cloud_details
189   select * from sector_detail
190   select * from companyy
191   select * from finances
192
193
194   --Queries
195
```

Results Messages

	finance_id	cloud_budget	prev_budget	migration_cost	current_budget	finance_company_id
1	1	1000000000	5900000	9000000	2100000000	1
2	2	3000000	1200000	230000	15000000	2
3	3	1400000	230000	500000	23000000	3
4	4	780000000	23000000	460000000	20000000000	4
5	5	395868544	243499857	196449300	2122680405	5
6	6	1425521742	538226546	129083005	2242347992	6
7	7	1996732774	1921809181	154896705	7041769245	7
8	8	1622784181	558232790	19904433	9949077094	8
9	9	1732686569	1203412299	575225328	3239761659	9
10	10	2045340132	1676001144	1215950888	8900462675	10
11	11	1488390942	734952381	154599195	4177722507	11
12	12	531393923	28918826	17483793	6042369003	12
13	13	1390625426	453374744	197591127	2071115171	13
14	14	656240862	445193395	428640615	8786354231	14
15	15	2380684780	1684204258	217066972	2770962766	15
16	16	1187786167	1022701018	124740770	6513809931	16
17	17	1297442900	1262266913	879999445	4129308776	17
18	18	1964600199	1645637468	1062290556	7440651107	18
19	19	1015210762	76264170	18564380	2354683695	19
20	20	1838665453	408349147	26966623	5805938722	20

Queries

ADS_Query.sql - ist659...jamaru) 6 SQLQuery_1 - ist659...jamaru) 6 localhost ist659jamaru.database.windows.net

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
194   --Queries
195
196   1) Compute the total budget left after allocating the current budget to cloud & migration cost (using cast function)
197
198   select cast(current_budget as money)-cast(cloud_budget as money) - cast(migration_cost as money) as total_budget_left from finances
199
200   2) Companies which migrated 10 years after their foundation
201
202   select * from companyy where company_migration_year - company_year_founded <=10
203
204   3) Sector with most number of companies who migrated to a cloud and their average percentage growth
205
206   SELECT top 1 s.sector_name,COUNT(c.company_category) as mycount
207   FROM companyy c join sector_detail s on c.company_sector_id=s.sector_id GROUP BY sector_name order by count(company_category) desc
208
209   4) Companies apart from the media category who have migrated to cloud after 2015 and using SaaS model?
```

Results Messages

	total_budget_left
1	1091000000.0000
2	11770000.0000
3	21100000.0000
4	18760000000.0000
5	1530362561.0000
6	687743245.0000
7	4890139766.0000
8	8306388480.0000
9	931849762.0000
10	5639171655.0000
11	2534732370.0000
12	5493491287.0000
13	482898618.0000
14	7701472754.0000
15	173211014.0000
16	5201282994.0000

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
2) Show the companies which migrated 10 years after their foundation

select * from companyy where company_migration_year - company_year_founded <=10

3) Find the sector with most number of companies who migrated to a cloud and their average percentage growth

SELECT s.sector_name,COUNT(c.company_category) as mycount
FROM companyy c join sector_detail s on c.company_sector_id=s.sector_id GROUP BY sector_name order by count(company_category) desc

4) Companies apart from the media category who have migrated to cloud after 2015 and using SaaS model?

select * from companyy c left join cloud_details d on c.company_cloud_id = d.cloud_id
where c.company_migration_year >= 2015 and d.service_model_name='Saas' and c.company_category != 'Media'

--- Function with Concat
```

Results Messages

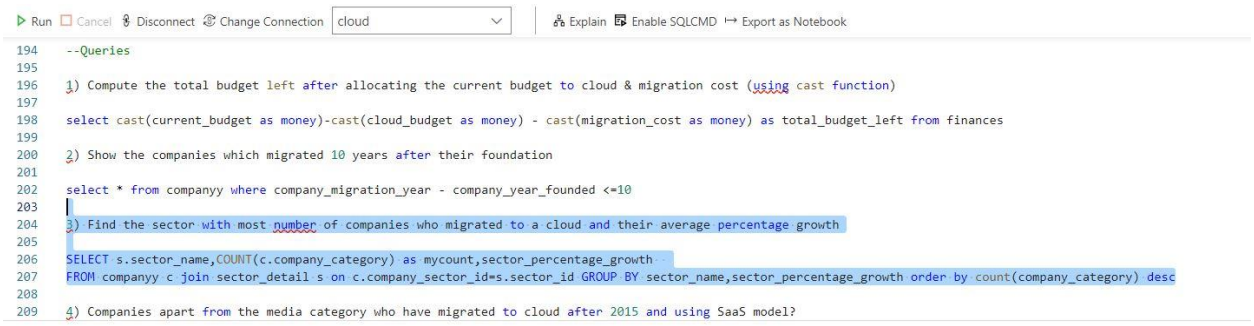
	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	company
1	5	Etsy	2005	Ecommerce	Brooklyn	NY	11201	www.etsy.com	2020
2	6	Apple	1976	Electronics	Los Altos	CA	94022	www.apple.com	2016
3	9	Deloitte	1845	Professional services	London	UK	35203	www.deloitte.com	2017
4	12	Pfizer	1849	Pharma	Brooklyn	NY	11208	www.pfizer.com	2016
5	21	Ford	1903	Automobile	Detroit	MI	48127	www.ford.com	2018
6	26	Huntington	1866	Banking	Columbus	OH	43004	www.huntington.com	2016

Run Cancel Disconnect Change Connection cloud Explain Enable SQLCMD Export as Notebook

```
--Queries

1) Compute the total budget left after allocating the current budget to cloud & migration cost (using cast function)

select cast(current_budget as money)-cast(cloud_budget as money) - cast(migration_cost as money) as total_budget_left from finances

2) Show the companies which migrated 10 years after their foundation

select * from companyy where company_migration_year - company_year_founded <=10

3) Sector with most number of companies who migrated to a cloud and their average percentage growth

SELECT top 1 s.sector_name,COUNT(c.company_category) as mycount
FROM companyy c join sector_detail s on c.company_sector_id=s.sector_id GROUP BY sector_name order by count(company_category) desc

4) Companies apart from the media category who have migrated to cloud after 2015 and using SaaS model?
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	company
1	3	Pinterest	2009	Media	San Francisco	CA	94016	www.pinterest.com	2017
2	4	Instagram	2010	Media	San Francisco	CA	94105	www.instagram.com	2010
3	7	MediaMath	2007	Media	New York City	NY	10008	www.mediamath.com	2014
4	16	Tesla	2003	Automobile	San Carlos	CA	94070	www.tesla.com	2012
5	20	Uber Technologies	2009	Service Provider	San Francisco	CA	94102	www.uber.com	2019
6	28	Zoom	2011	Media	San Jose	CA	94088	www.zoom.com	2020

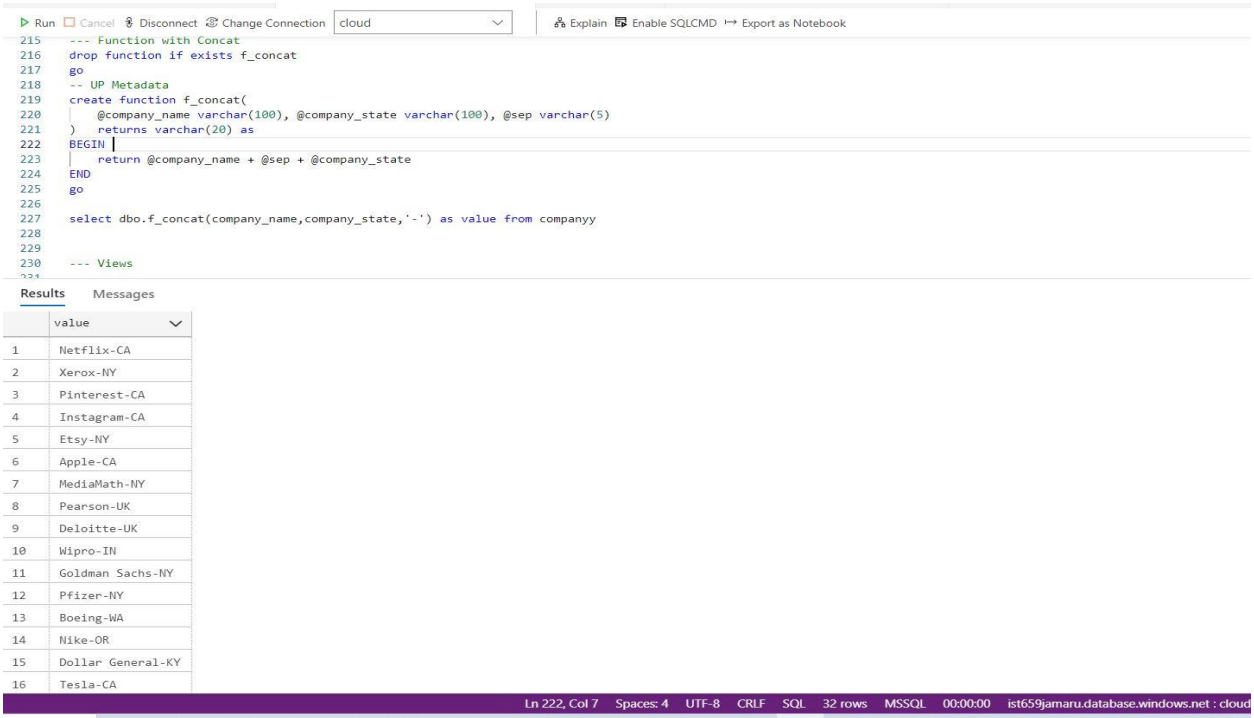


```
--Queries

1) Compute the total budget left after allocating the current budget to cloud & migration cost (using cast function)

select cast(current_budget as money)-cast(cloud_budget as money) - cast(migration_cost as money) as total_budget_left from finances

2) Show the companies which migrated 10 years after their foundation

select * from companyy where company_migration_year - company_year_founded <=10

3) Find the sector with most number of companies who migrated to a cloud and their average percentage growth

SELECT s.sector_name,COUNT(c.company_category) as mycount,sector_percentage_growth
FROM companyy c join sector_detail s on c.company_sector_id=s.sector_id GROUP BY sector_name,sector_percentage_growth order by count(company_category) desc

4) Companies apart from the media category who have migrated to cloud after 2015 and using SaaS model?
```

Results Messages

	sector_name	mycount	sector_percentage_growth
1	Media	5	10
2	Technology	3	30.2
3	Electronics	3	20.3
4	Aerospace	3	9
5	Banking	3	12
6	Products	2	17
7	Automobile	2	7
8	Retailer	2	22.4
9	Service Provider	2	10
10	Payment service	2	35
11	Professional services	2	11
12	Pharma	2	29
13	Food	1	27.8

Concat Function



```
--- Function with Concat
drop function if exists f_concat
go
-- UP Metadata
create function f_concat(
    @company_name varchar(100), @company_state varchar(100), @sep varchar(5)
)   returns varchar(20) as
BEGIN
    return @company_name + @sep + @company_state
END
go

select dbo.f_concat(company_name,company_state,'-') as value from companyy


--- Views
```

Results Messages

	value
1	Netflix-CA
2	Xerox-NY
3	Pinterest-CA
4	Instagram-CA
5	Etsy-NY
6	Apple-CA
7	MediaMath-NY
8	Pearson-UK
9	Deloitte-UK
10	Wipro-IN
11	Goldman Sachs-NY
12	Pfizer-NY
13	Boeing-WA
14	Nike-OR
15	Dollar General-KY
16	Tesla-CA

Ln 222, Col 7 Spaces: 4 UTF-8 CRLF SQL 32 rows MSSQL 00:00:00 ist659jamaru.database.windows.net : cloud

Views

```
230  --- Views
231
232  drop view if exists v_company
233  go
234  -- UP Metadata
235  CREATE VIEW v_company AS
236  SELECT top 5 dbo.f_concat(c.company_name,s.sector_name,',') as company_sector,c.company_id,c.company_year_founded,c.company_city,c.company_state,c.company_zipcode,
237  c.company_website,c.company_migration_year,s.sector_percentage_growth FROM companyy c join sector_detail s on c.company_sector_id= s.sector_id
238  GO
239  select * from v_company
240
241  -- String split & cross apply
242
243  select company_id, company_state, value from companyy cross apply string_split(company_city,' ')
244
245
```

Results | Messages

	company_sector	company_id	company_year_founded	company_city	company_state	company_zipcode	company_website	company_migration_year
1	Netflix,Media	1	1997	Scotts Valley	CA	95066	www.netflix.com	2008
2	Xerox,Technology	2	1906	Rochester	NY	14602	www.xerox.com	2012
3	Pinterest,Service Pr	3	2009	San Francisco	CA	94016	www.pinterest.com	2017
4	Instagram,Media	4	2010	San Francisco	CA	94105	www.instagram.com	2010
5	Etsy,Payment service	5	2005	Brooklyn	NY	11201	www.etsy.com	2020

	company_id	company_state	value
1	1	CA	Scotts
2	1	CA	Valley
3	2	NY	Rochester
4	3	CA	San
5	3	CA	Francisco
6	4	CA	San
7	4	CA	Francisco
8	5	NY	Brooklyn
9	6	CA	Los

Function with String Search

```
248
249  -- Function with String Search
250  drop function if exists f_search_company
251  go
252
253  create function f_search_company(
254      @company_website varchar(50)
255  )returns table AS
256  return
257      select company_id,company_name,company_category, company_state, company_zipcode, company_city, value from
258      companyy cross apply string_split(company_website,'.') sear where sear.value=@company_website
259  GO
260
261  select * from dbo.f_search_company('www')
262
263
```

Results | Messages

	company_id	company_name	company_category	company_state	company_zipcode	company_city	value
9	9	Deloitte	Professional services	UK	35203	London	www
10	10	Wipro	Professional services	IN	560035	Bengaluru	www
11	11	Goldman Sachs	Professional services	NY	10001	New York City	www
12	12	Pfizer	Pharma	NY	11208	Brooklyn	www
13	13	Boeing	Aerospace	WA	98124	Seattle	www
14	14	Nike	Products	OR	97401	Eugene	www
15	15	Dollar General	Retailer	KY	42164	Scottsville	www
16	16	Tesla	Automobile	CA	94070	San Carlos	www
17	17	Nvidia	Technology	CA	95050	Santa Clara	www
18	18	United Airline…	Aerospace	IL	60007	Chicago	www
19	19	Nordstrom	Retailer	WA	98101	Seattle	www
20	20	Uber Technolog…	Service Provider	CA	94102	San Francisco	www
21	21	Ford	Automobile	MI	48127	Detroit	www
22	22	PayPal	Payment service	CA	94020	Palo Alto	www
23	23	Spotify	Media	SW	10316	Stockholm	www

Triggers

ADS_Query.sql - ist659...jamaru) 6 ● | SQLQuery_1 - ist659...jamaru) 6 ● | localhost | ist659jamaru.database.windows.net

Run | Cancel | Disconnect | Change Connection | cloud | Explain | Enable SQLCMD | Export as Notebook

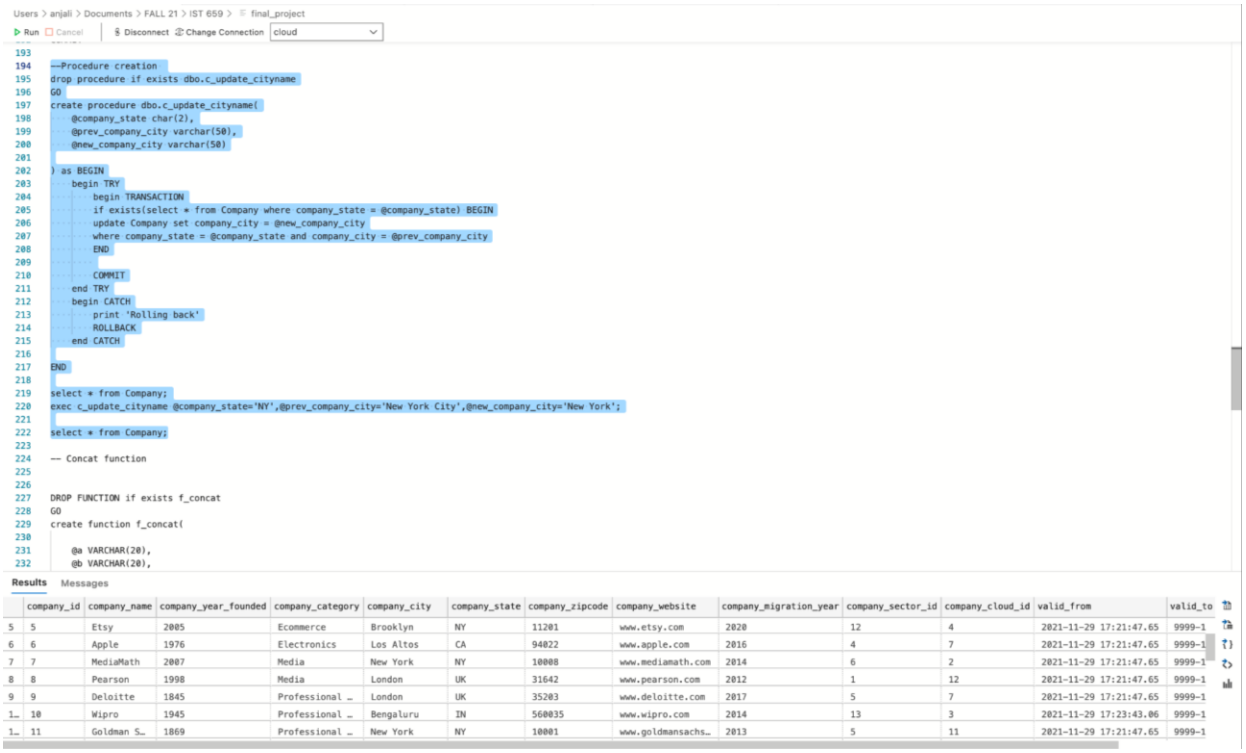
```
263
264  ---Triggers
265
266  alter table finances
267  add fin_stat varchar(20)
268  GO
269
270  drop trigger if exists t_company
271  GO
272
273  create trigger t_company on finances
274      after update as
275  BEGIN
276      update finances set fin_stat=
277      CASE
278      when migration_cost>prev_budget then 'Unstable Budget'
279      when migration_cost<prev_budget then 'Stable Budget'
280      end
281  END
282
283  update finances set migration_cost=6000000 where finance_id=1
284      
285  select * from finances where finance_id=1
286
287  update finances set migration_cost=5800000 where finance_id=1
288
289  select * from finances where finance_id=1
290
```

Results | Messages

	finance_id	cloud_budget	prev_budget	migration_cost	current_budget	finance_company_id	fin_stat
1	1	1000000000	5900000	6000000	2100000000	1	Unstable Budget

	finance_id	cloud_budget	prev_budget	migration_cost	current_budget	finance_company_id	fin_stat
1	1	1000000000	5900000	5800000	2100000000	1	Stable Budget

Stored Procedures



```
--Procedure creation
drop procedure if exists dbo.c_update_cityname
GO
create procedure dbo.c_update_cityname(
    @company_state char(2),
    @prev_company_city varchar(50),
    @new_company_city varchar(50)

) as BEGIN
    begin TRY
        begin TRANSACTION
        if exists(select * from Company where company_state = @company_state) BEGIN
        update Company set company_city = @new_company_city
        where company_state = @company_state and company_city = @prev_company_city
        END

        COMMIT
    end TRY
    begin CATCH
        print 'Rolling back'
        ROLLBACK
    end CATCH

END

select * from Company;
exec c_update_cityname @company_state='NY',@prev_company_city='New York City',@new_company_city='New York';

select * from Company;

-- Concat function


DROP FUNCTION if exists f_concat
GO
create function f_concat(

    @a VARCHAR(20),
    @b VARCHAR(20),
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	company_migration_year	company_sector_id	company_cloud_id	valid_from	valid_to
5	5	Etsy	2005	Ecommerce	Brooklyn	NY	11201	www.etsy.com	2020	12	4	2021-11-29 17:21:47.65	9999-1
6	6	Apple	1976	Electronics	Los Altos	CA	94022	www.apple.com	2016	4	7	2021-11-29 17:21:47.65	9999-1
7	7	MediaMath	2007	Media	New York	NY	10008	www.mediamath.com	2014	6	2	2021-11-29 17:21:47.65	9999-1
8	8	Pearson	1998	Media	London	UK	31642	www.pearson.com	2012	1	12	2021-11-29 17:21:47.65	9999-1
9	9	Deloitte	1845	Professional …	London	UK	35203	www.deloitte.com	2017	5	7	2021-11-29 17:21:47.65	9999-1
1…	10	Wipro	1945	Professional …	Bengaluru	IN	560035	www.wipro.com	2014	13	3	2021-11-29 17:23:43.06	9999-1
1…	11	Goldman S…	1869	Professional …	New York	NY	10001	www.goldmansachs…	2013	5	11	2021-11-29 17:21:47.65	9999-1

Queries to answer some business questions.

```
--Select top 5 companies who have migrated to AWS hybrid cloud service

select top 5*
    from Company c
    join Cloud_detail i on c.company_cloud_id=i.cloud_id
     where i.migrated_to_service='AWS' AND i.cloud_type='Hybrid Cloud'
     ORDER BY c.company_name
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	comp
1	4	Instagram	2010	Media	San Francisco	CA	94105	www.instagram.com	201
2	16	Tesla	2003	Automobile	San Carlos	CA	94070	www.tesla.com	201

```
--The details of companies in the Technology sector that have migrated to cloud?
select * from Company
WHERE company_category='technology'
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	company
1	2	Xerox	1906	Technology	Rochester	NY	14602	www.xerox.com	2012
2	17	Nvidia	1993	Technology	Santa Clara	CA	95050	www.nvidia.com	2015

```sql
--Total number of companies that have opted for Public cloud service?
select c.company_name,c.company_year_founded,c.company_category,c.company_state,c.company_zipcode,c.company_website,c.company_migration_year,
        i.migrated_to_service,i.cloud_type
    from Company c
    join Cloud_detail i on c.company_cloud_id=i.cloud_id
    where i.cloud_type='Public Cloud'
    ORDER BY c.company_name
```

Results Messages

company_name	company_year_founded	company_category	company_state	company_zipcode	company_website	company_migration_year	migrated_t
Boeing	1916	Aerospace	WA	98124	www.boeing.com	2011	Google Cl
Dollar General	1939	Retailer	KY	42164	www.dollargeneral.com	2011	IBM
Ford	1903	Automobile	MI	48127	www.ford.com	2018	AWS
Goldman Sachs	1869	Professional services	NY	10001	www.goldmansachs.com	2013	IBM
Mcdonalds	1955	Food	CA	92401	www.mcdonalds.com	2010	IBM
MediaMath	2007	Media	NY	10008	www.mediamath.com	2014	AWS
Motorola	1928	Electronics	IL	60018	www.motorola.com	2015	Microsoft
Nordstrom	1901	Retailer	WA	98101	www.nordstrom.com	2013	Microsoft
Nvidia	1993	Technology	CA	95050	www.nvidia.com	2015	Oracle
Uber Technologies	2009	Service Provider	CA	94102	www.uber.com	2019	Google Cl
Xerox	1906	Technology	NY	14602	www.xerox.com	2012	Oracle

```sql
--Companies with migration cost more than 40 % of the total budget?

select c.company_name,c.company_year_founded,c.company_category,c.company_state,c.company_zipcode,c.company_website,c.company_migration_year
    from Company c
        join Finance f on c.company_id=f.finance_company_id
        WHERE f.migration_cost> 0.4*f.migration_cost

--Implementing a CASE query to determine has the best growth rate.
SELECT sector_name,sector_percentage_growth,
```

Results Messages

	company_name	company_year_founded	company_category	company_state	company_zipcode	company_website	company_migration_ye
1	Netflix	1997	Media	CA	95066	www.netflix.com	2008
2	Xerox	1906	Technology	NY	14602	www.xerox.com	2012
3	Pinterest	2009	Media	CA	94016	www.pinterest.com	2017
4	Instagram	2010	Media	CA	94105	www.instagram.com	2010
5	Etsy	2005	Ecommerce	NY	11201	www.etsy.com	2020
6	Apple	1976	Electronics	CA	94022	www.apple.com	2016
7	MediaMath	2007	Media	NY	10008	www.mediamath.com	2014
8	Pearson	1998	Media	UK	31642	www.pearson.com	2012
9	Deloitte	1845	Professional services	UK	35203	www.deloitte.com	2017
10	Wipro	1945	Professional services	KA	560035	www.wipro.com	2014
11	Goldman Sachs	1869	Professional services	NY	10001	www.goldmansachs.com	2013
12	Pfizer	1849	Pharma	NY	11208	www.pfizer.com	2016
13	Boeing	1916	Aerospace	WA	98124	www.boeing.com	2011
14	Nike	1964	Products	OR	97401	www.nike.com	2017
15	Dollar General	1939	Retailer	KY	42164	www.dollargeneral.com	2011
16	Tesla	2003	Automobile	CA	94070	www.tesla.com	2012
17	Nvidia	1993	Technology	CA	95050	www.nvidia.com	2015

```sql
--Implementing a CASE query to determine has the best growth rate.
SELECT sector_name,sector_percentage_growth,
CASE
    WHEN sector_percentage_growth < 10 THEN 'This sector has the lowest percentage growth rate'
    WHEN sector_percentage_growth>10 AND sector_percentage_growth<20  THEN 'This sector has a better percentage growth rate'
    WHEN sector_percentage_growth>20 AND sector_percentage_growth<30  THEN 'This sector has grown by 20 to 30 percent percentage growth rate'
    ELSE 'This sector has the best growth rate'
END AS TotalGrowth
FROM Sector
ORDER BY sector_percentage_growth desc
```

Results | Messages

	sector_name	sector_percentage_growth	TotalGrowth
1	Payment service	35	This sector has the best gro…
2	Technology	30.2	This sector has the best gro…
3	Pharma	29	This sector has grown by 20 …
4	Food	27.8	This sector has grown by 20 …
5	Retailer	22.4	This sector has grown by 20 …
6	Electronics	20.3	This sector has grown by 20 …
7	Products	17	This sector has a better per…
8	Ecommerce	15.6	This sector has a better per…
9	Banking	12	This sector has a better per…
10	Professional services	11	This sector has a better per…
11	Service Provider	10	This sector has the best gro…
12	Media	10	This sector has the best gro…
13	Aerospace	9	This sector has the lowest p…
14	Automobile	7	This sector has the lowest p…

```sql
--Top 5 companies with the highest cloud budget?

select top 5 company_name,company_city,company_category,company_website,cloud_budget
from Company join Finance on company_id = finance_company_id
order by cloud_budget DESC
```

Results | Messages

	company_name	company_city	company_category	company_website	cloud_budget
1	Boeing	Seattle	Aerospace	www.boeing.com	2855878941
2	United Airlines Holdings	Chicago	Aerospace	www.unitedairlinesholding…	2845082125
3	Citi	New York City	Banking	www.citi.com	2820660261
4	Pearson	London	Media	www.pearson.com	2772441985
5	Nike	Eugene	Products	www.nike.com	2745847073

```
--History table for Company

select * from Company;

ALTER TABLE Company ADD
    valid_from datetime2 (2)  GENERATED ALWAYS AS ROW START
        constraint df_company_valid_from DEFAULT DATEADD(second, -1, SYSUTCDATETIME()),
    valid_to datetime2 (2)  GENERATED ALWAYS AS ROW END
        constraint df_company_valid_to DEFAULT '9999.12.31 23:59:59.99',
    PERIOD FOR SYSTEM_TIME (valid_from, valid_to)
go
 ALTER TABLE Company SET (SYSTEM_VERSIONING = ON (HISTORY_TABLE = dbo.Company_history))
GO
select * from Company

update Company set company_state = 'IN' where company_name='Wipro'
select * from Company_history
```

Results Messages

	company_id	company_name	company_year_founded	company_category	company_city	company_state	company_zipcode	company_website	company_migration_year	company_sector_id	company_cloud_id	valid_fro
1	10	Wipro	1945	Professional services	Bengaluru	KA	560035	www.wipro.com	2014	13	3	2021-12-(

```
--Companies who have migrated to Google Cloud & IBM

select * from Cloud_detail

 select cloud_id,company_name,migrated_to_service from Company join Cloud_detail
 on company_cloud_id = cloud_id
 where migrated_to_service='IBM' OR migrated_to_service='Google Cloud'
```

Results Messages

	cloud_id	company_name	migrated_to_service
1	10	Netflix	IBM
2	9	Pinterest	Google Cloud
3	7	Apple	Google Cloud
4	12	Pearson	IBM
5	7	Deloitte	Google Cloud
6	11	Goldman Sachs	IBM
7	8	Boeing	Google Cloud
8	11	Dollar General	IBM
9	9	United Airlines Holdings	Google Cloud
10	8	Uber Technologies	Google Cloud
11	12	Citi	IBM
12	10	Whirpool	IBM
13	11	Mcdonalds	IBM

```
--Alter table to add a new column to the Finance table denoting % of total budget invested in cloud development/maintenance?

select * from Finance;

ALTER TABLE Finance
ADD percent_in_cloud_devp as ((cloud_budget/current_budget)*100)

select * from Finance
```

Results Messages

	finance_id	cloud_budget	prev_budget	migration_cost	current_budget	finance_company_id	percent_in_cloud_devp
1	1	1000000000	5900000	9000000	2100000000	1	47.61904761904761
2	2	3000000	1200000	230000	15000000	2	20
3	3	1400000	230000	500000	23000000	3	6.086956521739131
4	4	780000000	23000000	460000000	20000000000	4	3.9
5	5	2031684343	109283625	43390307	3854802162	5	52.705281817780616
6	6	496199516	196275116	76860732	3722376420	6	13.330181046010386
7	7	1854799707	1831127364	24519545	4052159241	7	45.77311987725016
8	8	2772441985	2141856417	806471458	8791863102	8	31.534180558035718
9	9	339915006	136929699	20120762	7910003208	9	4.297280254655492
10	10	347001462	159384578	120401803	1029341425	10	33.71101692521507
11	11	1264411532	1169319136	733558733	9676503807	11	13.066822038403192
12	12	2505825446	608273317	605831372	3760157827	12	66.64149648205711
13	13	2855878941	2540529202	1313249961	4740329080	13	60.2464278914577
14	14	2745847073	220875824	148767680	2972280711	14	92.38182190659178

```
--Delete the companies detail who are founded from 1845 to 1945?

begin TRANSACTION

delete from Finance where finance_company_id in(
select company_id from Company where company_year_founded between 1845 and 1945)
ROLLBACK
select * from Finance
DELETE from Company where company_year_founded between 1845 and 1945;
select * from Company;
ROLLBACK

select * from Company where company_year_founded between 1845 and 1945;
```

Results Messages

company_id	company_name	company_year_f…	company_catego…	company_city	company_state	company_zipcode	company_website	company_migrat…	company_sector…	company_cloud_…	valid_from

Team Log

Activity	Hours denoted	Date	Team Members involved
Formulation business questions	3	09/29/2021	Jay, Soham, Anjali
Requirement gathering	4	10/01/2021	Jay, Soham, Anjali
Identifying data entities, attributes and relationships	4	10/20/2021	Jay, Soham, Anjali
E-R diagram creation	3	10/22/2021	Soham
Identifying primary keys and foreign keys	1	10/26/2021	Jay, Soham, Anjali
Logical model creation	1	10/30/2021	Soham
Data Entry	3	11/3/2021	Jay, Soham, Anjali
Data Entry	3	11/7/2021	Jay, Soham, Anjali
Table creation and insert up and down scripts	3	11/15/2021	Jay
Formulating queries	3	11/23/2021	Jay, Soham, Anjali
Implementing stored procedures, History table, additional queries	3	11/29/2021	Anjali
Implementing triggers, function and additional queries	3	11/30/2021	Jay
Implementing queries and switch case functionality	3	11/30/2021	Soham
PowerApps Application UI	4	12/2/2021	Jay, Soham
Project documentation	4	12/3/2021	Anjali