Assignment: SQL Notebook for Peer Assignment

Estimated time needed: **60** minutes.

Introduction

Using this Python notebook you will:

1. Understand the Spacex DataSet
2. Load the dataset into the corresponding table in a Db2 database
3. Execute SQL queries to answer assignment questions

Overview of the DataSet

SpaceX has gained worldwide attention for a series of historic milestones.

It is the only private company ever to return a spacecraft from low-earth orbit, which it first accomplished in December 2010. SpaceX advertises Falcon 9 rocket launches on its website with a cost of 62 million dollars wheras other providers cost upward of 165 million dollars each, much of the savings is because Space X can reuse the first stage.

Therefore if we can determine if the first stage will land, we can determine the cost of a launch.

This information can be used if an alternate company wants to bid against SpaceX for a rocket launch.

This dataset includes a record for each payload carried during a SpaceX mission into outer space.

Download the datasets

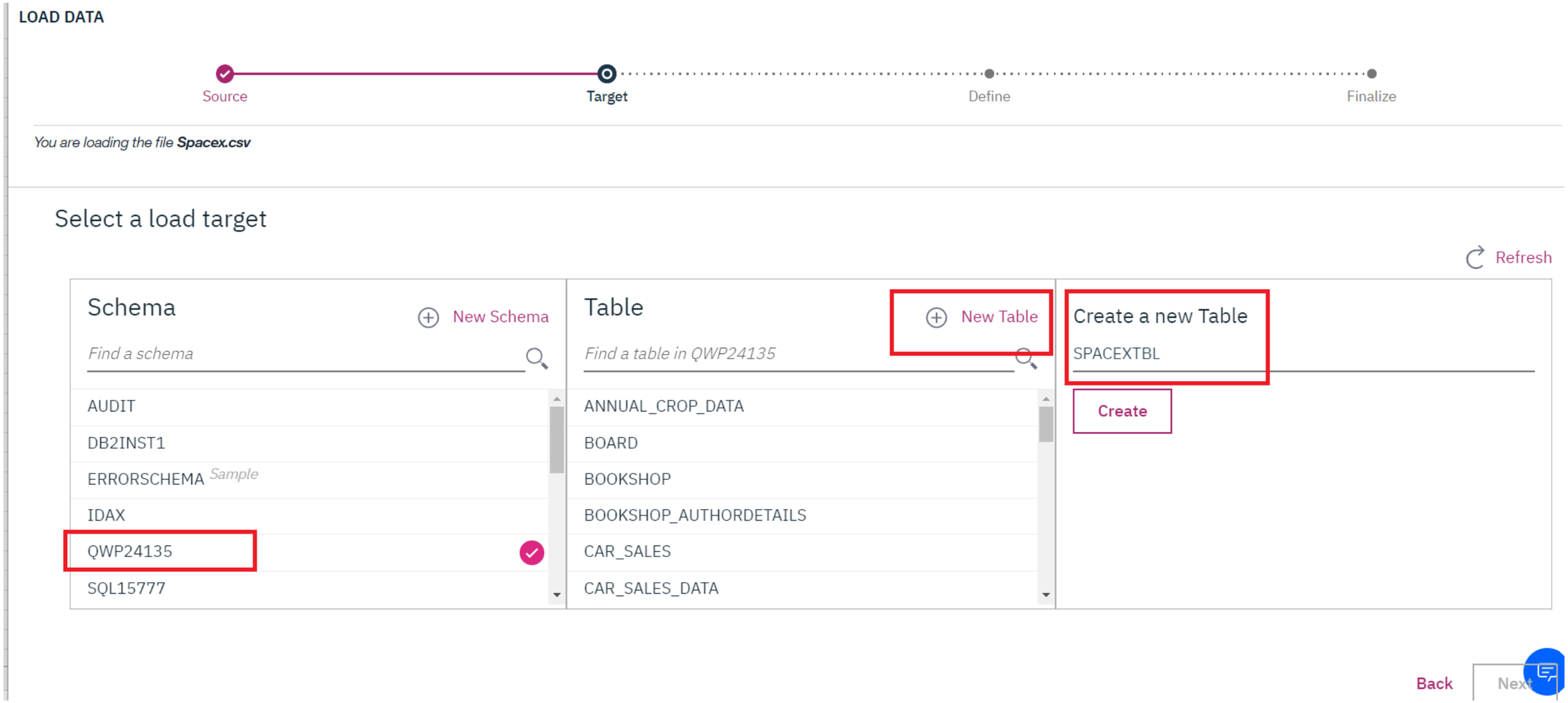
This assignment requires you to load the spacex dataset.

In many cases the dataset to be analyzed is available as a .CSV (comma separated values) file, perhaps on the internet. Click on the link below to download and save the dataset (.CSV file):

Spacex DataSet

Store the dataset in database table

it is highly recommended to manually load the table using the database console LOAD tool in DB2.



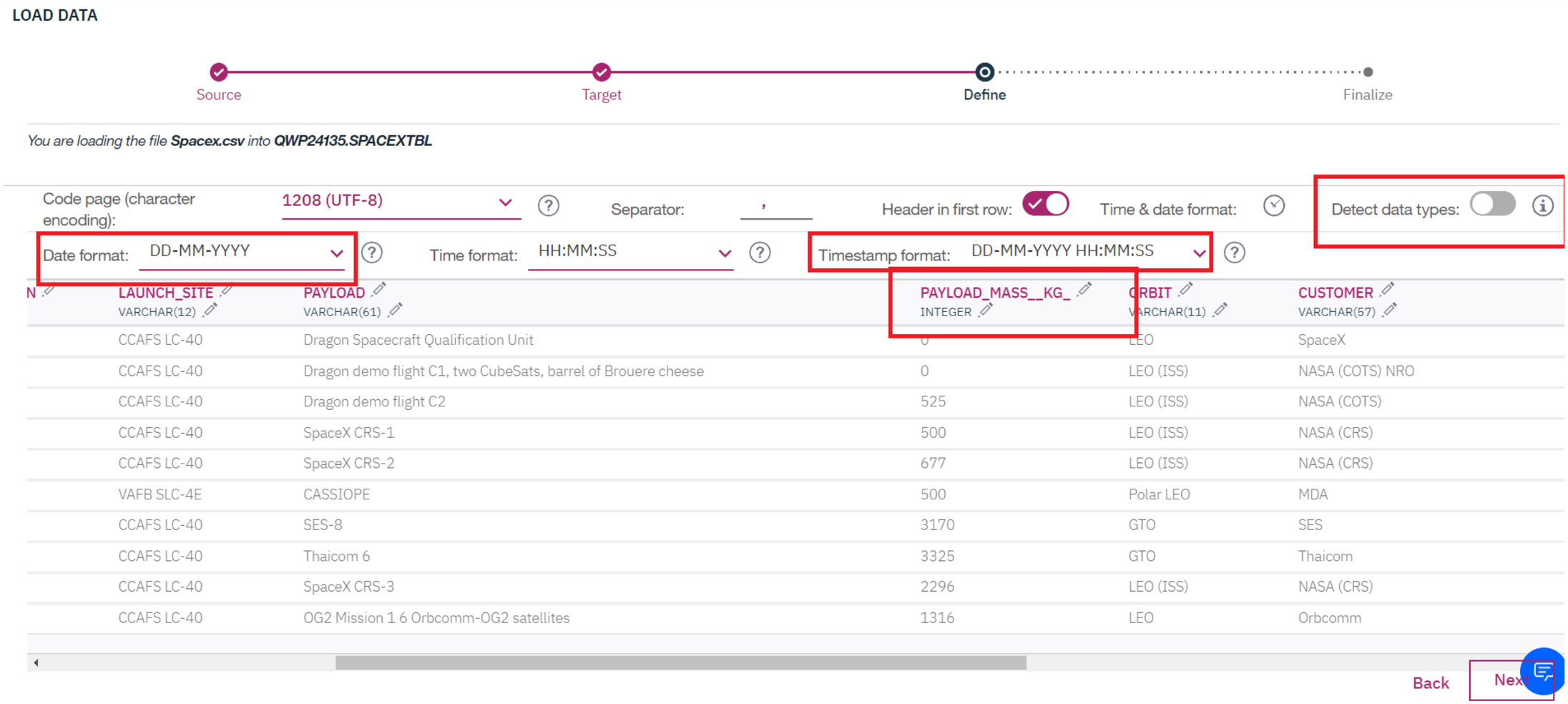
Now open the Db2 console, open the LOAD tool, Select / Drag the .CSV file for the dataset, Next create a New Table, and then follow the steps on-screen instructions to load the data. Name the new table as follows:

SPACEXDATASET

Follow these steps while using old DB2 UI which is having Open Console Screen

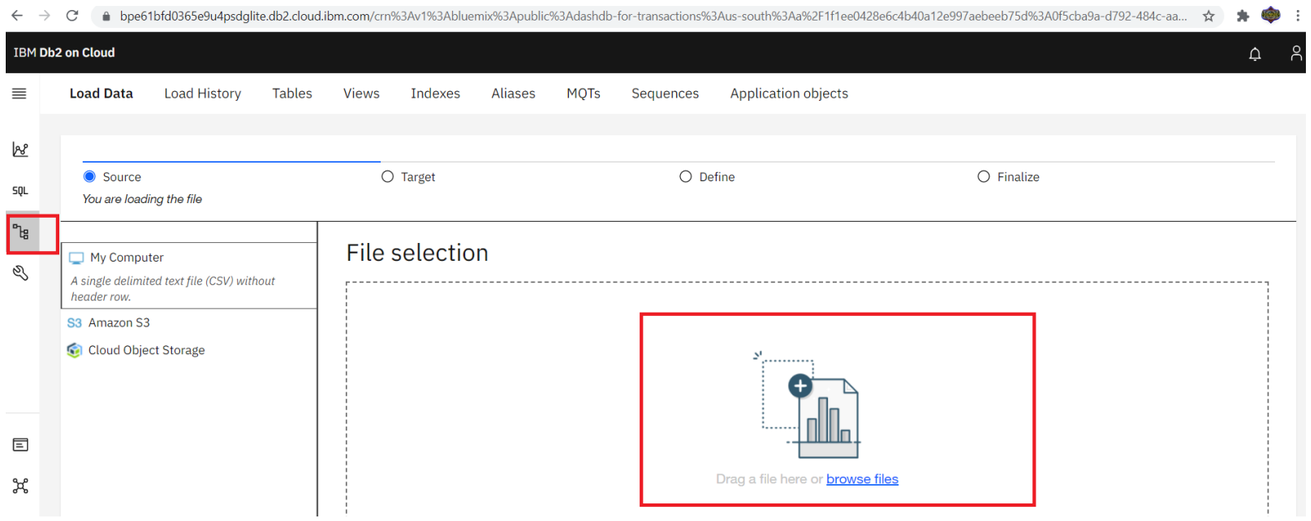
Note:While loading Spacex dataset, ensure that detect datatypes is disabled. Later click on the pencil icon(edit option).

1. Change the Date Format by manually typing DD-MM-YYYY and timestamp format as DD-MM-YYYY HH:MM:SS
2. Change the PAYLOAD_MASS__KG_ datatype to INTEGER.

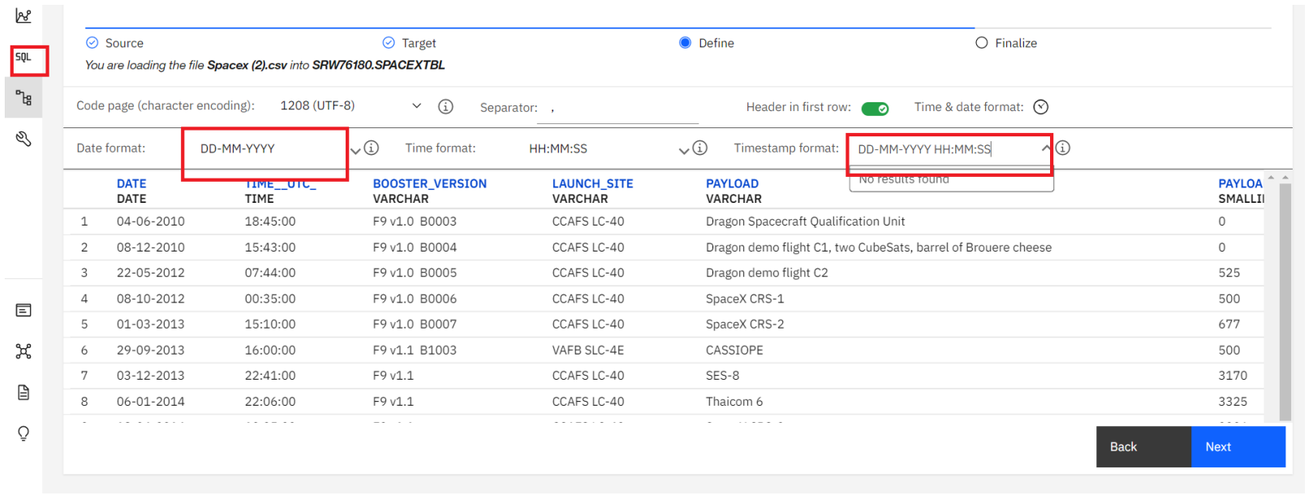


Changes to be considered when having DB2 instance with the new UI having Go to UI screen

- Refer to this insruction in this link for viewing the new Go to UI screen.
- Later click on **Data link(below SQL)** in the Go to UI screen and click on **Load Data** tab.
- Later browse for the downloaded spacex file.



- Once done select the schema andload the file.



In [1]:
```
!pip install sqlalchemy==1.3.9
#!pip install sqlalchemy==1.3.9
```

```
Collecting sqlalchemy==1.3.9
  Downloading SQLAlchemy-1.3.9.tar.gz (6.0 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 6.0/6.0 MB 53.1 MB/s eta 0:00:0000:0100:01
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: sqlalchemy
  Building wheel for sqlalchemy (setup.py) ... done
  Created wheel for sqlalchemy: filename=SQLAlchemy-1.3.9-cp37-cp37m-linux_x86_64.whl size=1159122 sha256=72b996f536dd0e615a7b43dc4fe021291b56d131104efaf042ee8dd0d1d85ec7
  Stored in directory: /home/jupyterlab/.cache/pip/wheels/ef/95/ac/c232f83b415900c26553c64266e1a2b2863bc63e7a5d606c7e
Successfully built sqlalchemy
Installing collected packages: sqlalchemy
  Attempting uninstall: sqlalchemy
    Found existing installation: SQLAlchemy 1.3.24
    Uninstalling SQLAlchemy-1.3.24:
      Successfully uninstalled SQLAlchemy-1.3.24
Successfully installed sqlalchemy-1.3.9
```

Connect to the database

Let us first load the SQL extension and establish a connection with the database

In [2]:
```
%load_ext sql
```

In [3]:
```
import csv, sqlite3

con = sqlite3.connect("my_data1.db")
cur = con.cursor()
```

In [4]:
```
!pip install -q pandas==1.1.5
```

In [5]:
```
%sql sqlite:///my_data1.db
```

Out[5]:
```
'Connected: @my_data1.db'
```

In [6]:
```
import pandas as pd
df = pd.read_csv("https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DS0321EN-SkillsNetwork/labs/module_2/data/Spacex.csv")
df.to_sql("SPACEXTBL", con, if_exists='replace', index=False, method ="multi")
```

```
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages/pandas/core/generic.py:2882: UserWarning: The spaces in these column names will not be changed. In pandas versions < 0.14, spaces were converted to underscores.
  both result in 0.1234 being formatted as 0.12.
```

Tasks

Now write and execute SQL queries to solve the assignment tasks.

Note: If the column names are in mixed case enclose it in double quotes For Example "Landing_Outcome"

Task 1

Display the names of the unique launch sites in the space mission

In [7]:
```
%sql SELECT * FROM SPACEXTBL
```

```
 * sqlite:///my_data1.db
Done.
```

Out[7]:

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
04-06-2010	18:45:00	F9 v1.0 B0003	CCAFS LC-40	Dragon Spacecraft Qualification Unit	0	LEO	SpaceX	Success	Failure (parachute)
08-12-2010	15:43:00	F9 v1.0 B0004	CCAFS LC-40	Dragon demo flight C1, two CubeSats, barrel of Brouere cheese	0	LEO (ISS)	NASA (COTS) NRO	Success	Failure (parachute)
22-05-2012	07:44:00	F9 v1.0 B0005	CCAFS LC-40	Dragon demo flight C2	525	LEO (ISS)	NASA (COTS)	Success	No attempt
08-10-2012	00:35:00	F9 v1.0 B0006	CCAFS LC-40	SpaceX CRS-1	500	LEO (ISS)	NASA (CRS)	Success	No attempt
01-03-2013	15:10:00	F9 v1.0 B0007	CCAFS LC-40	SpaceX CRS-2	677	LEO (ISS)	NASA (CRS)	Success	No attempt
29-09-2013	16:00:00	F9 v1.1 B1003	VAFB SLC-4E	CASSIOPE	500	Polar LEO	MDA	Success	Uncontrolled (ocean)
03-12-2013	22:41:00	F9 v1.1	CCAFS LC-40	SES-8	3170	GTO	SES	Success	No attempt
06-01-2014	22:06:00	F9 v1.1	CCAFS LC-40	Thaicom 6	3325	GTO	Thaicom	Success	No attempt
18-04-2014	19:25:00	F9 v1.1	CCAFS LC-40	SpaceX CRS-3	2296	LEO (ISS)	NASA (CRS)	Success	Controlled (ocean)
14-07-2014	15:15:00	F9 v1.1	CCAFS LC-40	OG2 Mission 1 6 Orbcomm-OG2 satellites	1316	LEO	Orbcomm	Success	Controlled (ocean)
05-08-2014	08:00:00	F9 v1.1	CCAFS LC-40	AsiaSat 8	4535	GTO	AsiaSat	Success	No attempt
07-09-2014	05:00:00	F9 v1.1 B1011	CCAFS LC-40	AsiaSat 6	4428	GTO	AsiaSat	Success	No attempt
21-09-2014	05:52:00	F9 v1.1 B1010	CCAFS LC-40	SpaceX CRS-4	2216	LEO (ISS)	NASA (CRS)	Success	Uncontrolled (ocean)
10-01-2015	09:47:00	F9 v1.1 B1012	CCAFS LC-40	SpaceX CRS-5	2395	LEO (ISS)	NASA (CRS)	Success	Failure (drone ship)
11-02-2015	23:03:00	F9 v1.1 B1013	CCAFS LC-40	DSCOVR	570	HEO	U.S. Air Force NASA NOAA	Success	Controlled (ocean)
02-03-2015	03:50:00	F9 v1.1 B1014	CCAFS LC-40	ABS-3A Eutelsat 115 West B	4159	GTO	ABS Eutelsat	Success	No attempt
14-04-2015	20:10:00	F9 v1.1 B1015	CCAFS LC-40	SpaceX CRS-6	1898	LEO (ISS)	NASA (CRS)	Success	Failure (drone ship)
27-04-2015	23:03:00	F9 v1.1 B1016	CCAFS LC-40	Turkmen 52 / MonacoSAT	4707	GTO	Turkmenistan National Space Agency	Success	No attempt
28-06-2015	14:21:00	F9 v1.1 B1018	CCAFS LC-40	SpaceX CRS-7	1952	LEO (ISS)	NASA (CRS)	Failure (in flight)	Precluded (drone ship)
22-12-2015	01:29:00	F9 FT B1019	CCAFS LC-40	OG2 Mission 2 11 Orbcomm-OG2 satellites	2034	LEO	Orbcomm	Success	Success (ground pad)
17-01-2016	18:42:00	F9 v1.1 B1017	VAFB SLC-4E	Jason-3	553	LEO	NASA (LSP) NOAA CNES	Success	Failure (drone ship)
04-03-2016	23:35:00	F9 FT B1020	CCAFS LC-40	SES-9	5271	GTO	SES	Success	Failure (drone ship)

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
08-04-2016	20:43:00	F9 FT B1021.1	CCAFS LC-40	SpaceX CRS-8	3136	LEO (ISS)	NASA (CRS)	Success	Success (drone ship)
06-05-2016	05:21:00	F9 FT B1022	CCAFS LC-40	JCSAT-14	4696	GTO	SKY Perfect JSAT Group	Success	Success (drone ship)
27-05-2016	21:39:00	F9 FT B1023.1	CCAFS LC-40	Thaicom 8	3100	GTO	Thaicom	Success	Success (drone ship)
15-06-2016	14:29:00	F9 FT B1024	CCAFS LC-40	ABS-2A Eutelsat 117 West B	3600	GTO	ABS Eutelsat	Success	Failure (drone ship)
18-07-2016	04:45:00	F9 FT B1025.1	CCAFS LC-40	SpaceX CRS-9	2257	LEO (ISS)	NASA (CRS)	Success	Success (ground pad)
14-08-2016	05:26:00	F9 FT B1026	CCAFS LC-40	JCSAT-16	4600	GTO	SKY Perfect JSAT Group	Success	Success (drone ship)
14-01-2017	17:54:00	F9 FT B1029.1	VAFB SLC-4E	Iridium NEXT 1	9600	Polar LEO	Iridium Communications	Success	Success (drone ship)
19-02-2017	14:39:00	F9 FT B1031.1	KSC LC-39A	SpaceX CRS-10	2490	LEO (ISS)	NASA (CRS)	Success	Success (ground pad)
16-03-2017	06:00:00	F9 FT B1030	KSC LC-39A	EchoStar 23	5600	GTO	EchoStar	Success	No attempt
30-03-2017	22:27:00	F9 FT B1021.2	KSC LC-39A	SES-10	5300	GTO	SES	Success	Success (drone ship)
01-05-2017	11:15:00	F9 FT B1032.1	KSC LC-39A	NROL-76	5300	LEO	NRO	Success	Success (ground pad)
15-05-2017	23:21:00	F9 FT B1034	KSC LC-39A	Inmarsat-5 F4	6070	GTO	Inmarsat	Success	No attempt
03-06-2017	21:07:00	F9 FT B1035.1	KSC LC-39A	SpaceX CRS-11	2708	LEO (ISS)	NASA (CRS)	Success	Success (ground pad)
23-06-2017	19:10:00	F9 FT B1029.2	KSC LC-39A	BulgariaSat-1	3669	GTO	Bulsatcom	Success	Success (drone ship)
25-06-2017	20:25:00	F9 FT B1036.1	VAFB SLC-4E	Iridium NEXT 2	9600	LEO	Iridium Communications	Success	Success (drone ship)
05-07-2017	23:38:00	F9 FT B1037	KSC LC-39A	Intelsat 35e	6761	GTO	Intelsat	Success	No attempt
14-08-2017	16:31:00	F9 B4 B1039.1	KSC LC-39A	SpaceX CRS-12	3310	LEO (ISS)	NASA (CRS)	Success	Success (ground pad)
24-08-2017	18:51:00	F9 FT B1038.1	VAFB SLC-4E	Formosat-5	475	SSO	NSPO	Success	Success (drone ship)
07-09-2017	14:00:00	F9 B4 B1040.1	KSC LC-39A	Boeing X-37B OTV-5	4990	LEO	U.S. Air Force	Success	Success (ground pad)
09-10-2017	12:37:00	F9 B4 B1041.1	VAFB SLC-4E	Iridium NEXT 3	9600	Polar LEO	Iridium Communications	Success	Success (drone ship)
11-10-2017	22:53:00	F9 FT B1031.2	KSC LC-39A	SES-11 / EchoStar 105	5200	GTO	SES EchoStar	Success	Success (drone ship)
30-10-2017	19:34:00	F9 B4 B1042.1	KSC LC-39A	Koreasat 5A	3500	GTO	KT Corporation	Success	Success (drone ship)

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
15-12-2017	15:36:00	F9 FT B1035.2	CCAFS SLC-40	SpaceX CRS-13	2205	LEO (ISS)	NASA (CRS)	Success	Success (ground pad)
23-12-2017	01:27:00	F9 FT B1036.2	VAFB SLC-4E	Iridium NEXT 4	9600	Polar LEO	Iridium Communications	Success	Controlled (ocean)
08-01-2018	01:00:00	F9 B4 B1043.1	CCAFS SLC-40	Zuma	5000	LEO	Northrop Grumman	Success (payload status unclear)	Success (ground pad)
31-01-2018	21:25:00	F9 FT B1032.2	CCAFS SLC-40	GovSat-1 / SES-16	4230	GTO	SES	Success	Controlled (ocean)
22-02-2018	14:17:00	F9 FT B1038.2	VAFB SLC-4E	Paz Tintin A & B	2150	SSO	Hisdesat exactEarth SpaceX	Success	No attempt
06-03-2018	05:33:00	F9 B4 B1044	CCAFS SLC-40	Hispasat 30W-6 PODSat	6092	GTO	Hispasat NovaWurks	Success	No attempt
30-03-2018	14:14:00	F9 B4 B1041.2	VAFB SLC-4E	Iridium NEXT 5	9600	Polar LEO	Iridium Communications	Success	No attempt
02-04-2018	20:30:00	F9 B4 B1039.2	CCAFS SLC-40	SpaceX CRS-14	2647	LEO (ISS)	NASA (CRS)	Success	No attempt
18-04-2018	22:51:00	F9 B4 B1045.1	CCAFS SLC-40	Transiting Exoplanet Survey Satellite (TESS)	362	HEO	NASA (LSP)	Success	Success (drone ship)
11-05-2018	20:14:00	F9 B5 B1046.1	KSC LC-39A	Bangabandhu-1	3600	GTO	Thales-Alenia/BTRC	Success	Success (drone ship)
22-05-2018	19:47:58	F9 B4 B1043.2	VAFB SLC-4E	Iridium NEXT 6 GRACE-FO 1, 2	6460	Polar LEO	Iridium Communications GFZ , NASA	Success	No attempt
04-06-2018	04:45:00	F9 B4 B1040.2	CCAFS SLC-40	SES-12	5384	GTO	SES	Success	No attempt
29-06-2018	09:42:00	F9 B4 B1045.2	CCAFS SLC-40	SpaceX CRS-15	2697	LEO (ISS)	NASA (CRS)	Success	No attempt
22-07-2018	05:50:00	F9 B5B1047.1	CCAFS SLC-40	Telstar 19V	7075	GTO	Telesat	Success	Success
25-07-2018	11:39:00	F9 B5B1048.1	VAFB SLC-4E	Iridium NEXT-7	9600	Polar LEO	Iridium Communications	Success	Success
07-08-2018	05:18:00	F9 B5 B1046.2	CCAFS SLC-40	Merah Putih	5800	GTO	Telkom Indonesia	Success	Success
10-09-2018	04:45:00	F9 B5B1049.1	CCAFS SLC-40	Telstar 18V / Apstar-5C	7060	GTO	Telesat	Success	Success
08-10-2018	02:22:00	F9 B5 B1048.2	VAFB SLC-4E	SAOCOM 1A	3000	SSO	CONAE	Success	Success
15-11-2018	20:46:00	F9 B5 B1047.2	KSC LC-39A	Es hail 2	5300	GTO	Es hailSat	Success	Success
03-12-2018	18:34:05	F9 B5 B1046.3	VAFB SLC-4E	SSO-A	4000	SSO	Spaceflight Industries	Success	Success
05-12-2018	18:16:00	F9 B5B1050	CCAFS SLC-40	SpaceX CRS-16	2500	LEO (ISS)	NASA (CRS)	Success	Failure
23-12-2018	13:51:00	F9 B5B1054	CCAFS SLC-40	GPS III-01	4400	MEO	USAF	Success	No attempt

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
11-01-2019	15:31:00	F9 B5 B1049.2	VAFB SLC-4E	Iridium NEXT-8	9600	Polar LEO	Iridium Communications	Success	Success
22-02-2019	01:45:00	F9 B5 B1048.3	CCAFS SLC-40	Nusantara Satu, Beresheet Moon lander, S5	4850	GTO	PSN, SpaceIL / IAI	Success	Success
02-03-2019	07:49:00	F9 B5B1051.1	KSC LC-39A	Crew Dragon Demo-1, SpaceX CRS-17	12055	LEO (ISS)	NASA (CCD)	Success	Success
04-05-2019	06:48:00	F9 B5B1056.1	CCAFS SLC-40	SpaceX CRS-17, Starlink v0.9	2495	LEO (ISS)	NASA (CRS)	Success	Success
24-05-2019	02:30:00	F9 B5 B1049.3	CCAFS SLC-40	Starlink v0.9, RADARSAT Constellation	13620	LEO	SpaceX	Success	Success
12-06-2019	14:17:00	F9 B5 B1051.2	VAFB SLC-4E	RADARSAT Constellation, SpaceX CRS-18	4200	SSO	Canadian Space Agency (CSA)	Success	Success
25-07-2019	22:01:00	F9 B5 B1056.2	CCAFS SLC-40	SpaceX CRS-18, AMOS-17	2268	LEO (ISS)	NASA (CRS)	Success	Success
06-08-2019	23:23:00	F9 B5 B1047.3	CCAFS SLC-40	AMOS-17, Starlink 1 v1.0	6500	GTO	Spacecom	Success	No attempt
11-11-2019	14:56:00	F9 B5 B1048.4	CCAFS SLC-40	Starlink 1 v1.0, SpaceX CRS-19	15600	LEO	SpaceX	Success	Success
05-12-2019	17:29:00	F9 B5B1059.1	CCAFS SLC-40	SpaceX CRS-19, JCSat-18 / Kacific 1	2617	LEO (ISS)	NASA (CRS), Kacific 1	Success	Success
17-12-2019	00:10:00	F9 B5 B1056.3	CCAFS SLC-40	JCSat-18 / Kacific 1, Starlink 2 v1.0	6956	GTO	Sky Perfect JSAT, Kacific 1	Success	Success
07-01-2020	02:33:00	F9 B5 B1049.4	CCAFS SLC-40	Starlink 2 v1.0, Crew Dragon in-flight abort test	15600	LEO	SpaceX	Success	Success
19-01-2020	15:30:00	F9 B5 B1046.4	KSC LC-39A	Crew Dragon in-flight abort test, Starlink 3 v1.0	12050	Sub-orbital	NASA (CTS)	Success	No attempt
29-01-2020	14:07:00	F9 B5 B1051.3	CCAFS SLC-40	Starlink 3 v1.0, Starlink 4 v1.0	15600	LEO	SpaceX	Success	Success
17-02-2020	15:05:00	F9 B5 B1056.4	CCAFS SLC-40	Starlink 4 v1.0, SpaceX CRS-20	15600	LEO	SpaceX	Success	Failure
07-03-2020	04:50:00	F9 B5 B1059.2	CCAFS SLC-40	SpaceX CRS-20, Starlink 5 v1.0	1977	LEO (ISS)	NASA (CRS)	Success	Success
18-03-2020	12:16:00	F9 B5 B1048.5	KSC LC-39A	Starlink 5 v1.0, Starlink 6 v1.0	15600	LEO	SpaceX	Success	Failure
22-04-2020	19:30:00	F9 B5 B1051.4	KSC LC-39A	Starlink 6 v1.0, Crew Dragon Demo-2	15600	LEO	SpaceX	Success	Success
30-05-2020	19:22:00	F9 B5B1058.1	KSC LC-39A	Crew Dragon Demo-2, Starlink 7 v1.0	12530	LEO (ISS)	NASA (CCDev)	Success	Success
04-06-2020	01:25:00	F9 B5 B1049.5	CCAFS SLC-40	Starlink 7 v1.0, Starlink 8 v1.0	15600	LEO	SpaceX, Planet Labs	Success	Success
13-06-2020	09:21:00	F9 B5 B1059.3	CCAFS SLC-40	Starlink 8 v1.0, SkySats-16, -17, -18, GPS III-03	15410	LEO	SpaceX, Planet Labs	Success	Success
30-06-2020	20:10:46	F9 B5B1060.1	CCAFS SLC-40	GPS III-03, ANASIS-II	4311	MEO	U.S. Space Force	Success	Success

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
20-07-2020	21:30:00	F9 B5 B1058.2	CCAFS SLC-40	ANASIS-II, Starlink 9 v1.0	5500	GTO	Republic of Korea Army, Spaceflight Industries (BlackSky)	Success	Success
07-08-2020	05:12:00	F9 B5 B1051.5	KSC LC-39A	Starlink 9 v1.0, SXRS-1, Starlink 10 v1.0	14932	LEO	SpaceX, Spaceflight Industries (BlackSky), Planet Labs	Success	Success
18-08-2020	14:31:00	F9 B5 B1049.6	CCAFS SLC-40	Starlink 10 v1.0, SkySat-19, -20, -21, SAOCOM 1B	15440	LEO	SpaceX, Planet Labs, PlanetIQ	Success	Success
30-08-2020	23:18:00	F9 B5 B1059.4	CCAFS SLC-40	SAOCOM 1B, GNOMES 1, Tyvak-0172	3130	SSO	CONAE, PlanetIQ, SpaceX	Success	Success
03-09-2020	12:46:14	F9 B5 B1060.2	KSC LC-39A	Starlink 11 v1.0, Starlink 12 v1.0	15600	LEO	SpaceX	Success	Success
06-10-2020	11:29:34	F9 B5 B1058.3	KSC LC-39A	Starlink 12 v1.0, Starlink 13 v1.0	15600	LEO	SpaceX	Success	Success
18-10-2020	12:25:57	F9 B5 B1051.6	KSC LC-39A	Starlink 13 v1.0, Starlink 14 v1.0	15600	LEO	SpaceX	Success	Success
24-10-2020	15:31:34	F9 B5 B1060.3	CCAFS SLC-40	Starlink 14 v1.0, GPS III-04	15600	LEO	SpaceX	Success	Success
05-11-2020	23:24:23	F9 B5B1062.1	CCAFS SLC-40	GPS III-04 , Crew-1	4311	MEO	USSF	Success	Success
16-11-2020	00:27:00	F9 B5B1061.1	KSC LC-39A	Crew-1, Sentinel-6 Michael Freilich	12500	LEO (ISS)	NASA (CCP)	Success	Success
21-11-2020	17:17:08	F9 B5B1063.1	VAFB SLC-4E	Sentinel-6 Michael Freilich, Starlink 15 v1.0	1192	LEO	NASA / NOAA / ESA / EUMETSAT	Success	Success
25-11-2020	02:13:00	F9 B5 B1049.7	CCAFS SLC-40	Starlink 15 v1.0, SpaceX CRS-21	15600	LEO	SpaceX	Success	Success
06-12-2020	16:17:08	F9 B5 B1058.4	KSC LC-39A	SpaceX CRS-21	2972	LEO (ISS)	NASA (CRS)	Success	Success

In [8]:
```
%sql SELECT DISTINCT(LAUNCH_SITE) FROM SPACEXTBL
```

```
 * sqlite:///my_data1.db
Done.
```

Out[8]:

Launch_Site
CCAFS LC-40
VAFB SLC-4E
KSC LC-39A
CCAFS SLC-40

Task 2

Display 5 records where launch sites begin with the string 'CCA'

In [9]:
```
%sql SELECT * FROM SPACEXTBL WHERE LAUNCH_SITE LIKE "CCA%" LIMIT 5
```

```
 * sqlite:///my_data1.db
Done.
```

Out[9]:

Date	Time (UTC)	Booster_Version	Launch_Site	Payload	PAYLOAD_MASS__KG_	Orbit	Customer	Mission_Outcome	Landing _Outcome
04-06-2010	18:45:00	F9 v1.0 B0003	CCAFS LC-40	Dragon Spacecraft Qualification Unit	0	LEO	SpaceX	Success	Failure (parachute)
08-12-2010	15:43:00	F9 v1.0 B0004	CCAFS LC-40	Dragon demo flight C1, two CubeSats, barrel of Brouere cheese	0	LEO (ISS)	NASA (COTS) NRO	Success	Failure (parachute)
22-05-2012	07:44:00	F9 v1.0 B0005	CCAFS LC-40	Dragon demo flight C2	525	LEO (ISS)	NASA (COTS)	Success	No attempt
08-10-2012	00:35:00	F9 v1.0 B0006	CCAFS LC-40	SpaceX CRS-1	500	LEO (ISS)	NASA (CRS)	Success	No attempt
01-03-2013	15:10:00	F9 v1.0 B0007	CCAFS LC-40	SpaceX CRS-2	677	LEO (ISS)	NASA (CRS)	Success	No attempt

Task 3

Display the total payload mass carried by boosters launched by NASA (CRS)

In [10]:
```
%sql SELECT SUM(PAYLOAD_MASS__KG_) FROM SPACEXTBL WHERE CUSTOMER = "NASA (CRS)"
```

```
 * sqlite:///my_data1.db
Done.
```

Out[10]:

SUM(PAYLOAD_MASS__KG_)
45596

Task 4

Display average payload mass carried by booster version F9 v1.1

In [11]:
```
%sql SELECT AVG(PAYLOAD_MASS__KG_) FROM SPACEXTBL WHERE Booster_Version LIKE "F9 v1.1%"
```

```
 * sqlite:///my_data1.db
Done.
```

Out[11]:

AVG(PAYLOAD_MASS__KG_)
2534.6666666666665

Task 5

List the date when the first succesful landing outcome in ground pad was acheived.

Hint:Use min function

In [12]:
```
%%sql
SELECT MIN("Date")
FROM SPACEXTBL
WHERE
    "Landing _Outcome" = 'Success'
```

```
 * sqlite:///my_data1.db
Done.
```

Out[12]:

MIN("Date")
02-03-2019

Double check for missing Successful Mission Outcomes, Success payload status unclear

In [18]:
```
%sql SELECT DISTINCT(COUNT(Mission_Outcome)) FROM SPACEXTBL WHERE Mission_Outcome = "Success (payload status unclear)"
```

```
 * sqlite:///my_data1.db
Done.
```

Out[18]:

(COUNT(Mission_Outcome))
1

Double Check for successful misssion outcomes

In [19]:
```
%sql SELECT COUNT(Mission_Outcome) FROM SPACEXTBL WHERE Mission_Outcome = "Success"
```

```
 * sqlite:///my_data1.db
Done.
```

Out[19]:

COUNT(Mission_Outcome)
98

Double Check for failure mission outcomes

In [20]:
```
%sql SELECT COUNT(Mission_Outcome) FROM SPACEXTBL WHERE Mission_Outcome Like "Fail%"
```

```
 * sqlite:///my_data1.db
Done.
```

Out[20]:

COUNT(Mission_Outcome)
1

Task 6

List the names of the boosters which have success in drone ship and have payload mass greater than 4000 but less than 6000

In [21]:
```
%sql SELECT Booster_Version,Customer FROM SPACEXTBL WHERE PAYLOAD_MASS__KG_ BETWEEN 4000 AND 6000
```

```
 * sqlite:///my_data1.db
Done.
```

Out[21]:

Booster_Version	Customer
F9 v1.1	AsiaSat
F9 v1.1 B1011	AsiaSat
F9 v1.1 B1014	ABS Eutelsat
F9 v1.1 B1016	Turkmenistan National Space Agency
F9 FT B1020	SES
F9 FT B1022	SKY Perfect JSAT Group
F9 FT B1026	SKY Perfect JSAT Group
F9 FT B1030	EchoStar
F9 FT B1021.2	SES
F9 FT B1032.1	NRO
F9 B4 B1040.1	U.S. Air Force
F9 FT B1031.2	SES EchoStar
F9 B4 B1043.1	Northrop Grumman
F9 FT B1032.2	SES
F9 B4 B1040.2	SES
F9 B5 B1046.2	Telkom Indonesia
F9 B5 B1047.2	Es hailSat
F9 B5 B1046.3	Spaceflight Industries
F9 B5B1054	USAF
F9 B5 B1048.3	PSN, SpaceIL / IAI
F9 B5 B1051.2	Canadian Space Agency (CSA)
F9 B5B1060.1	U.S. Space Force
F9 B5 B1058.2	Republic of Korea Army, Spaceflight Industries (BlackSky)
F9 B5B1062.1	USSF

Task 7

List the total number of successful and failure mission outcomes

In [22]:
```
%sql SELECT COUNT(Mission_Outcome) FROM SPACEXTBL
```

```
 * sqlite:///my_data1.db
Done.
```

Out[22]:

COUNT(Mission_Outcome)
101

Task 8

List the names of the booster_versions which have carried the maximum payload mass. Use a subquery

In [23]:
```
%sql SELECT Booster_Version FROM SPACEXTBL WHERE PAYLOAD_MASS__KG_ = (SELECT MAX(PAYLOAD_MASS__KG_) from spacextbl)
```

```
 * sqlite:///my_data1.db
Done.
```

Out[23]:

Booster_Version
F9 B5 B1048.4
F9 B5 B1049.4
F9 B5 B1051.3
F9 B5 B1056.4
F9 B5 B1048.5
F9 B5 B1051.4
F9 B5 B1049.5
F9 B5 B1060.2
F9 B5 B1058.3
F9 B5 B1051.6
F9 B5 B1060.3
F9 B5 B1049.7

Task 9

List the records which will display the month names, failure landing_outcomes in drone ship ,booster versions, launch_site for the months in year 2015.

Note: SQLLite does not support monthnames. So you need to use substr(Date, 4, 2) as month to get the months and substr(Date,7,4)='2015' for year.

In [24]:
```
%%sql
SELECT
    "Landing _Outcome",
    Booster_Version,
    Launch_Site,
    substr(Date,4,2)
FROM SPACEXTBL
WHERE
    substr(Date,7,4) = '2015'
```

```
 * sqlite:///my_data1.db
Done.
```

Out[24]:

Landing _Outcome	Booster_Version	Launch_Site	substr(Date,4,2)
Failure (drone ship)	F9 v1.1 B1012	CCAFS LC-40	01
Controlled (ocean)	F9 v1.1 B1013	CCAFS LC-40	02
No attempt	F9 v1.1 B1014	CCAFS LC-40	03
Failure (drone ship)	F9 v1.1 B1015	CCAFS LC-40	04
No attempt	F9 v1.1 B1016	CCAFS LC-40	04
Precluded (drone ship)	F9 v1.1 B1018	CCAFS LC-40	06
Success (ground pad)	F9 FT B1019	CCAFS LC-40	12

Task 10

Rank the count of successful landing_outcomes between the date 04-06-2010 and 20-03-2017 in descending order.

In [25]:
```
%%sql
SELECT
    "Landing _Outcome",
    COUNT("Landing _Outcome"),
    RANK() OVER(ORDER BY COUNT("Landing _Outcome") DESC) as ranking
FROM SPACEXTBL
WHERE
    Date BETWEEN '04-06-2010' AND '20-03-2017'
GROUP BY
    1
ORDER BY
    2 DESC
```

```
 * sqlite:///my_data1.db
Done.
```

Out[25]:

Landing _Outcome	COUNT("Landing _Outcome")	ranking
Success	20	1
No attempt	10	2
Success (drone ship)	8	3
Success (ground pad)	6	4
Failure (drone ship)	4	5
Failure	3	6
Controlled (ocean)	3	6
Failure (parachute)	2	8
No attempt	1	9

Reference Links

- Hands-on Lab : String Patterns, Sorting and Grouping
- Hands-on Lab: Built-in functions
- Hands-on Lab : Sub-queries and Nested SELECT Statements
- Hands-on Tutorial: Accessing Databases with SQL magic
- Hands-on Lab: Analyzing a real World Data Set

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Change log

Date	Version	Changed by	Change Description
2021-07-09	0.2	Lakshmi Holla	Changes made in magic sql
2021-05-20	0.1	Lakshmi Holla	Created Initial Version