A report on

SATEUREKA – THE MODERN-DAY SATELLITE DATABASE

by

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Date:

Abstract

Assembled by experts at the Union of Concerned Scientists (UCS), the **SATEUREKA** is a listing of many operational satellites orbiting around Earth. Our intent in producing the database is to create a research tool for specialists and non-specialists alike by collecting open-source information on operational satellites and presenting it in a format that can be easily manipulated for research and analysis.

SATEUREKA denotes “SATELLITE - EUREKA”, which stores golden significant information about the rocketry system across globe. This database minimizes redundancy of data, and in the same time provides the required information at our doorstep.

Privilege of dashboard access is given only to the project directors who can perform a variety of operations in the dashboard. It includes viewing the details of candidates who would be interning at the organization. Upload of Fuel amount and getting the value of payload proportions are done with the help of stored procedures and functions. Triggers are used to indicate a fuel warning if the fuel capacity drops drastically. Backup information of the employees who have retired or resigned is achieved using triggers. Views are used to get the list of active satellites and the astronaut list who are fit to pursue their missions.

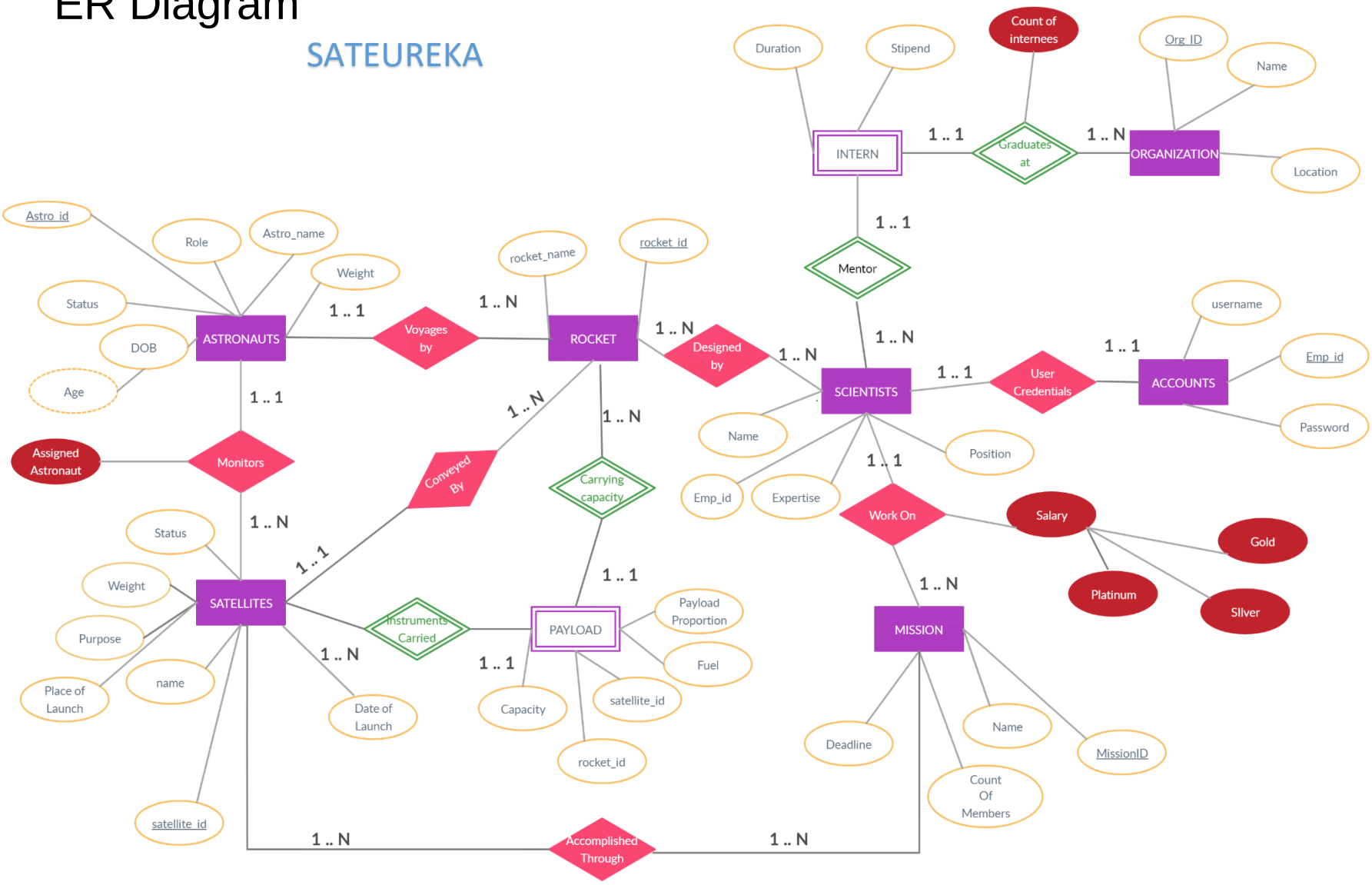
Front End: HTML, CSS, JAVASCRIPT

Back End: PHP, MYSQL

Salient Features of the System

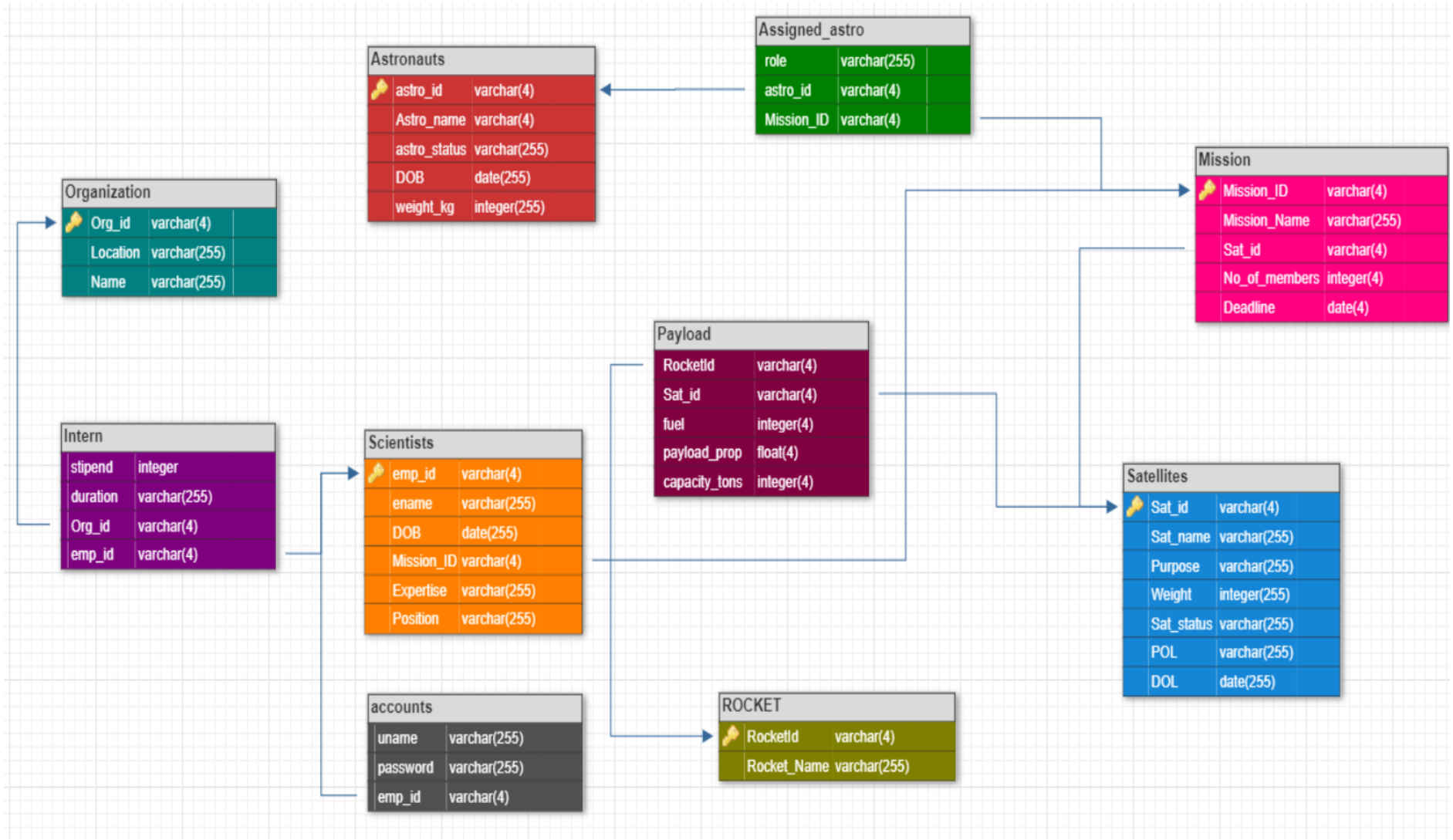
1. The Mentors List for internees would be available in the home page, along with their expertise which enables the interns to choose the scientist under whom they wish to work based on their domain of interest.
2. Confidential status of Missions can be obtained.
3. An auto warn system to indicate Fuel-Warning if the fuel amount of the rocket falls below 50% mark.
4. Authenticated information storage of scientists who have resigned or retired.
5. Provision of quick retrieval of Astronaut details, including their fitness, role in the mission, exclusively for Project Directors.
6. Three level monitored scrutinizing system for viewing the dashboard.
7. A chat query system which addresses the queries raised directly by the project director.
8. Countdown for the upcoming mission is always displayed in the homepage.
9. Latest Achievements would be displayed

ER Diagram


SATEUREKA
Duration
Stipend
Count of internees
Org_ID
Name
INTERN
1 .. 1
Graduates at
1 .. N
ORGANIZATION
Location
1 .. 1
Mentor
1 .. N
Astro_id
Role
Astro_name
Weight
Status
DOB
Age
ASTRONAUTS
1 .. 1
Voyages by
1 .. N
rocket_name
rocket_id
ROCKET
1 .. N
Designed by
1 .. N
username
1 .. 1
Emp_id
ACCOUNTS
Password
1 .. 1
User Credentials
SCIENTISTS
Name
Position
Emp_id
Expertise
1 .. 1
Work On
Salary
Gold
Platinum
Sliver
1 .. N
MISSION
Deadline
Name
MissionID
Count Of Members
1 .. 1
Assigned Astronaut
Monitors
1 .. N
1 .. N
Conveyed By
1 .. N
Carrying capacity
1 .. N
Status
Weight
Purpose
Place of Launch
name
satellite_id
SATELLITES
1 .. 1
1 .. N
Date of Launch
Instruments Carried
1 .. 1
PAYLOAD
Payload Proportion
Fuel
Capacity
satellite_id
rocket_id
1 .. N
Accomplished Through
1 .. N

DATABASE Schema

SATEUREKA



Instances of each Relation

ASSIGNED_ASTRO

astro_id	mission_id	role
A-01	M001	Commanding and piloting space shuttle
A-02	M002	Respond to and report to emergencies
A-03	M003	Conduct tests and experiments in zero gravity
A-08	M001	Communicating constantly with guard and mission co
A-09	M002	Breif with mission headquarters about upcoming ass
A-10	M003	Respond to and report emergencies
A-11	M005	Breif with mission headquarters about upcoming ass
A-14	M006	Commanding and piloting space shuttle
A-16	M007	Respond to and report emergencies
A-18	M008	Commanding and piloting space shuttle
A-19	M010	Communicating constantly with guard and mission co
A-07	M007	Conduct tests and experiments in zero gravity
A-06	M001	Commanding and piloting space shuttle
A-07	M001	Commanding and piloting space shuttle

ASTRONAUTS

astro_id	Astro_name	DOB	weight_kg	astro_status
A-01	Kiran	2000-01-01	60	Fit
A-02	Karthick Raja	2000-02-02	55	Fit
A-03	Srihari	1949-03-03	55	Fit
A-04	Ananya	1997-04-04	80	Unfit
A-05	Geroge	1996-05-05	70	Unfit
A-06	Tessa	1995-06-06	40	Fit
A-07	Larrissa	1997-07-07	55	Fit
A-08	Tim Bone	1994-08-08	50	Fit
A-09	Mandy	1993-09-09	52	Fit
A-10	Reshmi	1992-10-10	62	Fit

INTERN

org_id	stipend	duration	emp_id
O-14	10000	6 months	E-20
O-08	25000	6 months	E-21
O-08	13000	4 months	E-22
O-13	5000	4 months	E-23
O-09	62000	7 months	E-24
O-01	180000	3 months	E-25
O-12	20000	2 months	E-26
O-07	20000	1 months	E-27
O-11	6070	2 months	E-28
O-06	1100	1 months	E-29
O-10	88800	3 months	E-30
O-10	200000	6 months	E-31
O-09	10100	5 months	E-32
O-15	200000	1 year	E-33

MISSION

mission_id	mission_name	deadline	no_of_memebers	sat_id
M001	Mahabali	2018-03-15	87	S017
M002	Grahanam	2019-11-21	122	S005
M003	Jatayu	2019-04-15	94	S014
M004	Mars Orbiter Mission	2016-04-24	127	S020
M005	Shukyayaan	2013-06-01	221	S009
M006	Aditya-1	2016-03-25	81	S019
M007	Akshara	2015-06-10	93	S006
M008	NISAR	2009-02-15	99	S008
M009	Gaganyaan	2017-09-12	222	S011
M010	Astrosat	2016-05-14	113	S018

ORGANISATION

org_id	name	location
O-01	IIT-Madras	Chennai
O-02	IIT-Bombay	Mumbai
O-03	IISC-Bangalore	Bangalore
O-04	Symbiosis	Pune
O-05	Aligarh Institute	Punjab
O-06	NIT-Roorkee	Roorkee
O-07	Anna University	Chennai
O-08	Patiala Institute	Punjab
O-09	SIMS	Andra Pradesh
O-10	AIIMS	Delhi

PAYLOAD

rocket_id	sat_id ▲ 1	fuel	payload_prop	capacity_tons
R06	S001	331	0.4434	1
R05	S002	443	0.5031	1
R04	S003	581	0.4503	1
R03	S004	992	0.5	1
R02	S005	810	0.5	1
R01	S006	779	0.43478	1
R21	S007	600	0.2597	1
R20	S008	1887	0.1666	2
R19	S009	1021	0.0465	2
R18	S010	334	0.09346	1
R17	S011	120	0.0435	2
R16	S012	120	0.1971	1

ROCKET

rocket_id	rocketname
R01	Atlas-Agena
R02	Thor-Delta
R03	Scout
R04	Rehbar I
R05	Saturn V
R06	Ariane 5
R07	Atlas-Centaur
R08	Titan IIIB
R09	Thor Burner
R10	Apollo 11

SALARY_INFO

emp_id	salary
E-02	800000
E-03	1600000
E-04	1000000
E-05	1200000
E-06	600000
E-07	300000
E-08	200000
E-09	80000
E-10	95000
E-11	200000

SATELLITES

sat_id	sat_name	purpose	weight	sat_status	POL	DOL
S001	Cartosat-1	Scientific Study	5	Active	Calangute	0000-00-00
S002	Aryabhatta	Mineralogical mapping of lunar surface	5	Active	Nellore	2010-10-22
S003	Chandrayaan-1	Chemical mapping of lunar surface	2	Active	Sriharikota	2008-08-02
S004	RISAT-1	Topographic mapping of lunar surface	3	Active	Nellore	2012-10-10
S005	Chandrayaan-2	Operate rover on surface	5	Active	Sriharikota	2019-11-19
S006	Cartosat-2	Spot imageries	5	Active	Candolim	2015-06-06
S007	Kalpana-1	Collection of weather data	4	Active	Arambol	2008-04-04
S008	INSAT-3A	Telecommunication and broadcast	5	Active	Vagator	2009-05-05
S009	SARAL	Sea surface,wave heights,wind speed	4	Active	Sriharikota	2013-06-01
S010	OCEANSAT-I	Hydro existence in Pluto	5	Active	Arambol	2014-07-01

SCIENTISTS

emp_id	ename	dob	mission_id	EXPERTISE	POSITION
E-01	ERWIN	0000-00-00	M001	PROPULSION CONTROL EXPERT	shuttle launch director
E-02	Lakshman	1991-01-12	M001	Spacecraft Autonomy Designer	ground launch sequencer
E-03	Srisha	1991-01-12	M001	Navigation Expert	Launch Weather Officer
E-04	Ramesh	1991-01-12	M001	Satellite Designer	Engineering support head
E-05	Aishwarya	1991-01-12	M001	Payload Expert	Vehicle manager
E-06	Ramya	1991-01-12	M001	Structural Engineer	International Space Station Manager
E-07	Siva	1991-01-12	M001	Flight Hardware Monitor	Preflight Mission Chairman
E-08	Deepika	1991-01-12	M001	System ENgineer	Chief engineer
E-09	Arjun	1991-01-12	M001	Operational InterCommunication	project director
E-10	Karun	1991-01-12	M001	Software Engineering	Software Engineer

Views

#	Name	Tables Involved	Description
1	Active – Satellites	Satellites	To indicate the list of satellites Which are currently active.
2	Fit- Astronauts	Astronauts	To provide the essential details of the astronaut who are fit enough to get a GO for their mission
3	Internship	Intern, Scientists, organisation	To display the list of internees who have been qualified to work in Sateureka
4	Mentors	Scientists	To provide the list of mentors of Sateureka, so that qualified interns can approach them based on their expertise

Procedures

#	Name & Description	Tables Involved	IN & OUT Parameter(s)
1	**Get Scientist Level** A procedure to display earnings of all scientists, using a categorization level based on their salary	Salary info	**IN** – EmployeeNumber VARCHAR 4 **OUT** – EmployeeLevel VARCHAR 20
2	**Mission Name** A procedure to provide mission name and satellite name of the scientist given his employee id.	Scientists	**IN** – EmpID VARCHAR 4 **OUT** – MissionName VARCHAR 20 **OUT** – SatelliteName VARCHAR 20
3	**Get_Scientist_Profile** A procedure to display the position, expertise and the mission, satellite under which the scientist is currently working	Scientist, Mission, Satellites	**IN** – EmpId VARCHAR 4 **OUT**- Position Varchar 80 **OUT**- Expertise Varchar 80 **OUT**- MissionName Varchar 80 **OUT**- SatelliteName Varchar 80
4	**List_Name** A procedure which lists the names of internees representing a geographical location	Organisation, Intern, Satellites	**IN** – Location Varchar 4 **INOUT** – Namelist Varchar 400

Functions

#	Name & Description	Tables Involved	Parameter(s)	Return Type
1	**Mission_status** a function that gets the mission_id and find the corresponding mission status	Mission, Satellites	(mid VARCHAR (4))	varchar
2	**Payload_proportion (in percentage)** A function that gets the satellite_id and returns the corresponding payload proportion in percentage	Payload	(sid VARCHAR (4))	float
3	**Salary (In lakhs)** A function that gets the emp_id and returns his/her salary figures in Lakhs	Salary_info	(eid VARCHAR (4))	decimal (8,4)
4	**get_astronaut_role** A function that returns the role of an astronaut given his id	Astronauts, Assigned_astro	(inpname VARCHAR (20))	varchar (60)

Triggers

#	Name & Description	Trigger Type	Tables Involved
1	**Astro_status** Trigger is to set the status of a newly enrolled astronaut as FIT.	Before Insert	Assigned_astro, astronauts
2	**Fuel_status** Trigger is to set the satellite status as FUEL WARNING or ACTIVE based on the updated fuel amount	After Update	Payload, Satellites
3	**Intern_checker** Trigger is to increment the count based on new internees	Before Insert	Intern, Organisation_count
4	**Intern_dechecker** Trigger is to maintain the organization count of internees and to delete from Employees table of Sateureka	Before Delete	Intern, organization_count, scientist

5	**Resigned_or_retire** Trigger is to backup essential details of outgoing employees and to delete their salary info	Before delete	Scientists, Salary_info

SQL

#	Name	Tables Involved	Constructs Used
1	To provide the details of internees grouped based on organization name and duration of the internship	Intern, Organization	Aggregate Function, Join, Group by
2	To provide an in-depth insight about missions and the corresponding satellites involved	Mission, Satellites	Join
3	To find the most successful mission in terms of salary earned by grouping the salary of members in the same mission	Scientists, Salary_info	Aggregate function, Join, Group by, Order by
4	To find the name and emp_id of scientists who are not interns	Scientists, Intern	Sub queries

5	To find the best rockets in terms of their capacity and fuel amount	Rocket, Payload	Join, Order by
6	To display the details of missions which are on time. i.e. Launched before their deadline	Satellites, Mission	Join, Date functions
7	To provide the astronaut profile in his/her mission	Astronauts, Assigned_astro, Mission	Join, Order by

VIEWS

1. create view `active - satellites` as select sat_id,sat_name, purpose from `satellites`;
2. create view `fit-astronauts` as select astro_id,Astro_name,weight_kg from `astronauts`;
3. create view `internship` as select emp_id,ename,org_id,name,duration from `organisation` natural join `intern` natural join `scientists`;
4. create view `mentor` as select emp_id,ename,expertise from `scientists`;

VIEWS

ACTIVE SATELLITES

sat_id	sat_name	purpose
S001	Cartosat-1	Scientific Study
S002	Aryabhatta	Mineralogical mapping of lunar surface
S003	Chandrayaan-1	Chemical mapping of lunar surface
S004	RISAT-1	Topographic mapping of lunar surface
S005	Chandrayaan-2	Operate rover on surface
S006	Cartosat-2	Spot imageries
S007	Kalpana-1	Collection of weather data
S008	INSAT-3A	Telecommunication and broadcast

FIT ASTRONAUTS

astro_id	Astro_name	weight_kg
A-01	Kiran	60
A-02	Karthick Raja	55
A-03	Srihari	55
A-06	Tessa	40
A-07	Larrissa	55
A-08	Tim Bone	50
A-09	Mandy	52
A-10	Reshmi	62
A-11	Keshika	85
A-14	Arun	35
A-16	Vaishakh	45
A-18	Shefali	60
A-19	Vineeta	70

INTERNSHIP

emp_id	ename	org_id	name	duration
E-25	Dawan	O-01	IIT-Madras	3 months
E-75	Dawan	O-01	IIT-Madras	3 months
E-35	MIshti	O-02	IIT-Bombay	11 months
E-85	Sives	O-02	IIT-Bombay	11 months
E-38	Jegan	O-03	IISC-Bangalore	2 months
E-40	Sourav	O-04	Symbiosis	3 months
E-42	NIvedhs	O-05	Aligarh Institute	5 months
E-29	Mahesh	O-06	NIT-Roorkee	1 months
E-44	rohan	O-06	NIT-Roorkee	1 months

MENTORS

emp_id	ename	EXPERTISE
E-01	ERWIN	PROPULSION CONTROL EXPERT
E-02	Lakshman	Spacecraft Autonomy Designer
E-03	Srisha	Navigation Expert
E-04	Ramesh	Satellite Designer
E-05	Aishwarya	Payload Expert
E-06	Ramya	Structural Engineer
E-07	Siva	Flight Hardware Monitor
E-08	Deepika	System ENgineer

SQL QUERIES

1. **SELECT name, duration,count(emp_id) as InternCount FROM `intern` natural join `organisation` group by `name`,`duration`;**

name	duration	InternCount
AIIMS	3 months	2
AIIMS	6 months	2
Aligarh Institute	5 months	1
Anna University	1 months	2
Anna University	1 week	1
Dr. APJ Abdul Kalam Institute of Eminenc	2 weeks	1
HITS	2 months	2
IISC-Bangalore	2 months	1
IIT-Bombay	11 months	2
IIT-Madras	3 months	2
Jamia Millia Islamia	4 months	2
Jawaharlal Nehru Institute	6 months	2
Jiwaji University	4 months	1
NIT-Roorkee	1 months	3
Osmania University	6 months	1
Patiala Institute	4 months	2
Patiala Institute	6 months	2
SIMS	5 months	2
SIMS	7 months	2
St.John College of Arts	1 year	2
Symbiosis	3 months	1
University of Calicut	18 months	2
Vardhman Mahaveer Institute	1 months	1
Vardhman Mahaveer Institute	14 weeks	1
Vivekananda Coleege	2 months	2

2. **SELECT * FROM `mission` NATURAL JOIN `satellites`;**

sat_id	mission_id	mission_name	deadline	no_of_memebers	sat_name	purpose	weight	sat_status	POL	DOL
S017	M001	Mahabali	2018-03-15	87	Ladee	Demonstrate Operational capabilities	3	Active	Arambol	2004-08-05
S005	M002	Grahanam	2019-11-21	122	Chandrayaan-2	Operate rover on surface	5	Active	Sriharikota	2019-11-19
S014	M003	Jatayu	2019-04-15	94	Maven	Degradation of atmosphere over time	6	Active	Vagator	2019-04-05
S020	M004	Mars Orbiter Mission	2016-04-24	127	Mangalyaan	Demonstrate rocket launch system	5	Fuel Warni	Sriharikota	2016-04-24
S009	M005	Shukyayaan	2013-06-01	221	SARAL	Sea surface,wave heights,wind speed	4	Active	Sriharikota	2013-06-01
S019	M006	Aditya-1	2016-03-25	81	Galex	Observe thousands of galaxies	3	Active	Vagator	2000-12-21
S006	M007	Akshara	2015-06-10	93	Cartosat-2	Spot imageries	5	Active	Candolim	2015-06-06
S008	M008	NISAR	2009-02-15	99	INSAT-3A	Telecommunication and broadcast	5	Active	Vagator	2009-05-05
S011	M009	Gaganyaan	2017-09-12	222	Bhaskara	Ability to soft landing	4	Fuel Warni	Calangute	2017-09-11
S018	M010	Astrosat	2016-05-14	113	Mariner	Venus Explanation	4	Fuel Warni	Goa	2007-02-18

3. **SELECT mission_id, sum(salary) FROM `scientists` NATURAL JOIN `salary_info` group by mission_id order by sum(salary);**

mission_id	sum(salary) ▲ 1
M003	420000
M009	420000
M006	650000
M004	650000
M002	2080000
M008	2180000
M007	6375000
M010	7566000
M005	9366000
M001	13875000

4. **select a.emp_id,a.ename from `scientists` as a where a.emp_id NOT IN (select b.emp_id from `intern` as b);**

emp_id	ename
E-01	ERWIN
E-02	Lakshman
E-03	Srisha
E-04	Ramesh
E-05	Aishwarya
E-06	Ramya
E-07	Siva
E-08	Deepika
E-09	Arjun
E-10	Karun

5. **SELECT rocketname, capacity_tons,fuel FROM `rocket` NATURAL JOIN `payload` order by capacity_tons desc,fuel desc;**

rocketname	capacity_tons 1	fuel 2
Titan IIIB	3	120
Apollo 11	3	120
Deacon	2	1887
Pegasus	2	120
Electron	2	1021
Scout	1	992
Space shuttle	1	882
Vanguard	1	852
Taurus	1	819
Thor-Delta	1	810
Atlas-Agena	1	779
Skylark	1	600
Rehbar I	1	581
Saturn V	1	443
Atlas Able	1	407
Thor Burner	1	390
Juno I	1	360
Falcon I	1	334
Ariane 5	1	331
Minotaur-C	1	120

6. **select * from `satellites` natural join `mission` where DATEDIFF(DOL, deadline) < 0;**

sat_id	sat_name	purpose	weight	sat_status	POL	DOL	mission_id	mission_name	deadline	no_of_memebers
S017	Ladee	Demonstrate Operational capabilities	3	Active	Arambol	2004-08-05	M001	Mahabali	2018-03-15	87
S005	Chandrayaan-2	Operate rover on surface	5	Active	Sriharikota	2019-11-19	M002	Grahanam	2019-11-21	122
S014	Maven	Degradation of atmosphere over time	6	Active	Vagator	2019-04-05	M003	Jatayu	2019-04-15	94
S019	Galex	Observe thousands of galaxies	3	Active	Vagator	2000-12-21	M006	Aditya-1	2016-03-25	81
S006	Cartosat-2	Spot imageries	5	Active	Candolim	2015-06-06	M007	Akshara	2015-06-10	93
S011	Bhaskara	Ability to soft landing	4	Fuel Warni	Calangute	2017-09-11	M009	Gaganyaan	2017-09-12	222
S018	Mariner	Venus Explanation	4	Fuel Warni	Goa	2007-02-18	M010	Astrosat	2016-05-14	113

7. **select Astro_name,mission_name,role from `astronauts` NATURAL join `assigned_astro` natural join `mission` order by mission_name;**

Astro_name	mission_name ▲ 1	role
Arun	Aditya-1	Commanding and piloting space shuttle
Vaishakh	Akshara	Respond to and report emergencies
Larrissa	Akshara	Conduct tests and experiments in zero gravity
Vineeta	Astrosat	Communicating constantly with guard and mission co
Mandy	Grahanam	Breif with mission headquarters about upcoming ass
Karthick Raja	Grahanam	Respond to and report to emergencies
Srihari	Jatayu	Conduct tests and experiments in zero gravity
Reshmi	Jatayu	Respond to and report emergencies
Tessa	Mahabali	Commanding and piloting space shuttle
Larrissa	Mahabali	Commanding and piloting space shuttle
Kiran	Mahabali	Commanding and piloting space shuttle
Tim Bone	Mahabali	Communicating constantly with guard and mission co
Shefali	NISAR	Commanding and piloting space shuttle
Keshika	Shukyayaan	Breif with mission headquarters about upcoming ass

PROCEDURES

1. GetScientistLevel

```
CREATE PROCEDURE `GetScientistLevel`(IN `EmployeeNumber` VARCHAR (4), OUT `EmployeeLevel` VARCHAR(20))
BEGIN
  DECLARE credit DECIMAL (10,2) ;
  SELECT salary INTO credit   FROM salary_info   WHERE emp_id =  EmployeeNumber;
  IF(credit > 50000 )THEN
     SET EmployeeLevel = 'PLATINUM';
  ELSEIF (credit <= 50000 AND credit > 10000) THEN
     SET EmployeeLevel = 'GOLD';
  ELSE
     SET EmployeeLevel = 'SILVER';
  END IF;
END


SET @P0=’E-81’
 CALL `GetScientistLevel` (@p0,@p1);
SELECT @p1 AS `EmployeeLevel`;
```

Execution results of routine `GetScientistLevel`

EmployeeLevel
GOLD

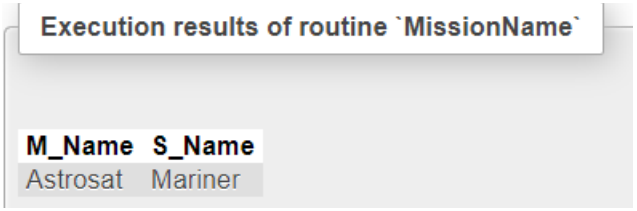
2. MissionName

```
CREATE PROCEDURE `MissionName`(IN `Empid` VARCHAR (4), OUT `M_Name` VARCHAR(20), OUT `S_Name` VARCHAR(20))
 BEGIN
   DECLARE mid VARCHAR (100);
SELECT    mission_id INTO mid FROM     scientists WHERE     emp_id = Empid;
 CASE mid
       WHEN  'M001' THEN
         SET M_Name = 'Mahabali';
         SET S_Name = 'Ladee';
       WHEN 'M002' THEN
         SET M_Name = 'Grahanam';
         SET S_Name = 'Chandrayaan-2';
       WHEN  'M003' THEN
         SET M_Name = 'Jatayu';
         SET S_Name = 'Maven';
       WHEN 'M004' THEN
         SET M_Name = 'Mars Orbiter Mission';
```

```
  SET S_Name = 'Mangalyaan';
WHEN  'M005' THEN
  SET M_Name = 'Shukyayaan';
  SET S_Name = 'Saral';
WHEN 'M006' THEN
  SET M_Name = 'Aditya-1';
  SET S_Name = 'Galex';
WHEN  'M007' THEN
  SET M_Name = 'Akshara';
  SET S_Name = 'Cartosat-2';
WHEN 'M008' THEN
  SET M_Name = 'NISAR';
  SET S_Name = 'INSAT-3A';
WHEN  'M009' THEN
  SET M_Name = 'Gaganyaan';
  SET S_Name = 'Bhaskara';
WHEN 'M010' THEN
  SET M_Name = 'Astrosat';
  SET S_Name = 'Mariner';

ELSE
```

```
        SET M_Name = 'Enter a valid mission no';
        SET S_Name = ' ';
    END CASE;
END
```

```
SET @p0=’E-99’;
CALL `MissionName`(@p0,@p1,@p2);
SELECT @p1 AS `M_Name`,@p2 AS `S_Name`;
```



3. get_scientist_profile

```
CREATE PROCEDURE `get_scientist_profile`(IN `names` VARCHAR(40), OUT `de_pos` VARCHAR(40), OUT `de_exp` VARCHAR(40), OUT `de_sat` VARCHAR(40), OUT `de_m` VARCHAR(40))
BEGIN
DECLARE de_names VARCHAR( 40 ) DEFAULT "";
DECLARE de_nams VARCHAR( 40 ) DEFAULT "";
DECLARE de_na VARCHAR( 40 ) DEFAULT "";
DECLARE de_n VARCHAR( 40 ) DEFAULT "";
```

```
SELECT POSITION INTO de_names FROM scientists WHERE emp_id = names;

SELECT EXPERTISE INTO de_nams FROM scientists WHERE emp_id = names;

SELECT sat_name INTO de_na FROM scientists NATURAL JOIN mission NATURAL JOIN satellites WHERE emp_id = names;

SELECT mission_name INTO de_n FROM scientists NATURAL JOIN mission NATURAL JOIN satellites WHERE emp_id = names;


 SET de_exp = de_nams;

 SET de_pos = de_names;

 SET de_sat = de_na;

 SET de_m = de_n;

END


SET @p0='E-61';

CALL `get_scientist_profile`(@p0,@p1,@p2,@p3,@p4);

SELECT @p1 AS `de_pos` , @p2 AS `de_exp` , @p3 AS `de_sat` , @p4 AS `de_m`;
```

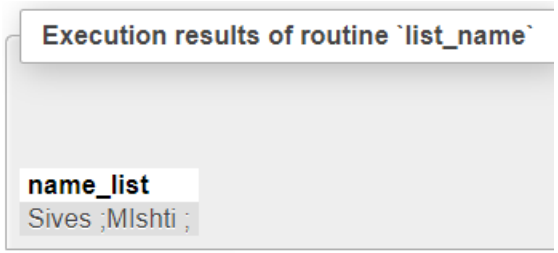
Execution results of routine `get_scientist_profile`

de_pos	de_exp	de_sat	de_m
shuttle launch director	PROPULSION CONTROL EXPERT	Cartosat-2	Akshara

4. list_name

```
CREATE  PROCEDURE `list_name`(IN `loc` VARCHAR(20), INOUT `name_list` VARCHAR(400))
BEGIN
DECLARE is_done INTEGER DEFAULT 0;
DECLARE s_name varchar(200) DEFAULT "";
DECLARE stud_cursor CURSOR FOR
SELECT ename FROM organisation NATURAL JOIN intern NATURAL JOIN scientists WHERE location = loc;
DECLARE CONTINUE HANDLER FOR NOT FOUND SET is_done = 1;
OPEN stud_cursor;
get_list : LOOP
FETCH stud_cursor INTO s_name;
IF is_done = 1 THEN
LEAVE get_list;
END IF;
SET name_list = CONCAT(s_name,' ;', name_list);
END LOOP get_list;
CLOSE stud_cursor;
END


SET @p0 = ‘Mumbai’;
SET @p1=’’;
```

```
CALL `list_name`(@p0,@p1);

SELECT @p1 AS `name_list`;
```

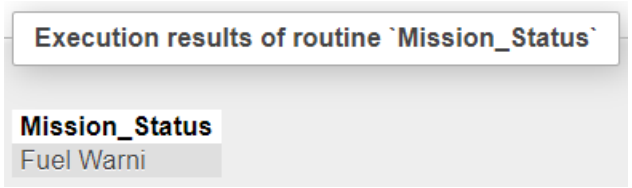


FUNCTIONS

1. Mission_Status

```
CREATE FUNCTION `Mission_Status`(`mid` VARCHAR(4))
 RETURNS VARCHAR(20) CHARSET
BEGIN

DECLARE C VARCHAR(20) ;

SELECT sat_status into C from `mission` natural join `satellites` where mission_id = mid;

RETURN C;

END


SET @p0='M010';
```

SELECT `MissionStatus`(@p0) AS `MissionStatus`;



2. Payload_proportion(in percentage)

CREATE FUNCTION `Payload_proportion(in percentage)`(`s` VARCHAR(4))

RETURNS FLOAT

BEGIN

DECLARE C NUMERIC(6,6) ;

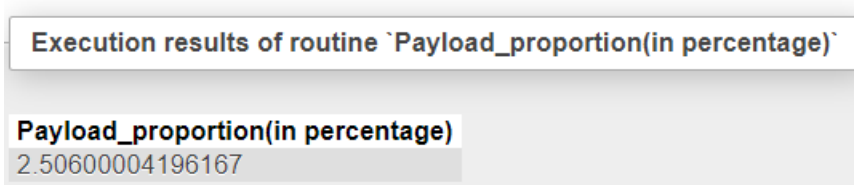
SELECT payload_prop into C from `payload` where sat_id = s;

RETURN C*100;

END

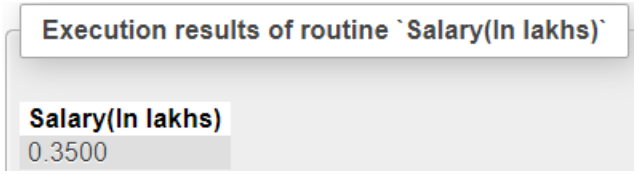
SET @p0='S020';

SELECT `Payload_Proportion(in percentage)`(@p0) AS ` Payload_Proportion(in percentage)`;



3. Salary(In lakhs)

```
CREATE FUNCTION `Salary(In lakhs)`(`e` VARCHAR(4))

RETURNS DECIMAL(8,4)

BEGIN

DECLARE C INT ;

SELECT salary into C from `salary_info` where emp_id = e;

RETURN C/100000;

END


SET @p0='E-36';

 SELECT `Salary(In lakhs)`(@p0) AS `Salary(In lakhs)`;
```



4. get_astronaut_role

```
CREATE FUNCTION `get_astronaut_role`(`inpname` VARCHAR(20))

 RETURNS VARCHAR(60) CHARSET

BEGIN

DECLARE de_name VARCHAR( 60 ) DEFAULT "";

SELECT role INTO de_name FROM astronauts NATURAL JOIN assigned_astro WHERE Astro_name = inpname;
```

```
RETURN de_name;

END


SET @p0='Shefali';

 SELECT `get_astronaut_role` (@p0) AS `get_astronaut_role`;
```