1A)

```sql
SELECT
 column_name,
 data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'customers';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'geolocation';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'order_items';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'order_reviews';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'orders';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'payments';

SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.INFORMATION_SCHEMA.COLUMNS`
WHERE table_name = 'products';
```

```sql
SELECT
  column_name,
  data_type
FROM `first-380802.ProjectTarget.information_schema.columns'
WHERE table_name = 'sellers';
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DE

Row	column_name	data_type
1	customer_id	STRING
2	customer_unique_id	STRING
3	customer_zip_code_prefix	INT64
4	customer_city	STRING
5	customer_state	STRING

1B)

```sql
SELECT
  MIN(order_purchase_timestamp) AS StartTime_period,
  MAX(order_purchase_timestamp) AS EndTime_period
FROM `ProjectTarget.orders`
```

Query results

SAVE RE

JOB INFORMATION | RESULTS | JSON | EXECUTION DET

Row	StartTime_period	EndTime_period
1	2016-09-04 21:15:19 UTC	2018-10-17 17:30:18 UTC

1C)

```
SELECT
  DISTINCT(customer_city),
  Customer_state
FROM `ProjectTarget.customers`
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DET

Row	customer_city	customer_state
1	acu	RN
2	ico	CE
3	ipe	RS
4	ipu	CE
5	ita	SC
6	itu	SP
7	jau	SP
8	luz	MG
9	poa	SP
10	uba	MG
11	una	BA

2A)

```
SELECT
  EXTRACT(YEAR FROM order_purchase_timestamp) AS Year,
  EXTRACT(MONTH FROM order_purchase_timestamp) AS Month,
  COUNT(order_id) AS Number_of_orders
FROM `ProjectTarget.orders`
GROUP BY year,Month
ORDER BY year,Month;
```

Query results

JOB INFORMATION | RESULTS | JSON

Row	Year	Month	Number_of_orde
1	2016	9	4
2	2016	10	324
3	2016	12	1
4	2017	1	800
5	2017	2	1780
6	2017	3	2682
7	2017	4	2404
8	2017	5	3700
9	2017	6	3245
10	2017	7	4026
11	2017	8	4331
12	2017	9	4285
13	2017	10	4631
14	2017	11	7544
15	2017	12	5673
16	2018	1	7269
17	2018	2	6728
18	2018	3	7211
19	2018	4	6939
20	2018	5	6873
21	2018	6	6167
22	2018	7	6292
23	2018	8	6512

2B)

```
SELECT
  CASE
  WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 00 AND 06 THEN "Dawn"
  WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 06 AND 12 THEN "Morning"
  WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 12 AND 18 THEN "Afternoon"
  WHEN EXTRACT(HOUR FROM order_purchase_timestamp) BETWEEN 18 AND 24 THEN "Night"
  END AS Time_bin,
  COUNT(Order_id) AS Number_of_orders
  FROM `ProjectTarget.orders`
  GROUP BY Time_bin;
```

Query results

JOB INFORMATION | RESULTS | JSON

Row	Time_bin	Number_of_orde
1	Morning	27733
2	Dawn	5242
3	Afternoon	38135
4	Night	28331

3A)

```
SELECT
  FORMAT_DATE('%Y-%m', o.order_purchase_timestamp) AS month,
  c.customer_state,
  COUNT(o.order_id) AS Number_of_orders
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
GROUP BY Month, c.customer_state
ORDER BY Month, c.customer_state
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXE

Row	month	customer_state	Number_of_orde
1	2016-09	RR	1
2	2016-09	RS	1
3	2016-09	SP	2
4	2016-10	AL	2
5	2016-10	BA	4
6	2016-10	CE	8
7	2016-10	DF	6
8	2016-10	ES	4
9	2016-10	GO	9
10	2016-10	MA	4
11	2016-10	MG	40
12	2016-10	MT	3
13	2016-10	PA	4

3B)

```
SELECT
customer_city,
COUNT(customer_id) AS Number_of_customers
FROM `ProjectTarget.customers`
GROUP BY customer_city
ORDER BY customer_city
```

Query results

JOB INFORMATION | RESULTS | JSON

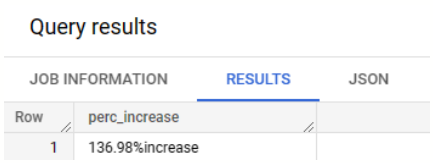
Row	customer_city	Number_of_cust
1	abadia dos dourados	3
2	abadiania	1
3	abaete	12
4	abaetetuba	11
5	abaiara	2
6	abaira	2
7	abare	2
8	abatia	3
9	abdon batista	1
10	abelardo luz	6
11	abrantes	2
12	abre campo	6
13	abreu e lima	11
14	acaiaca	2
15	acailandia	7
16	acaiutiba	1

4A)

```
WITH
year_value_2017 AS
(SELECT DISTINCT(order_year),
SUM(payment_value) OVER (PARTITION BY order_year ORDER BY order_year) AS order_sum
FROM(SELECT
EXTRACT(YEAR FROM o.order_purchase_timestamp) AS order_year,
EXTRACT(MONTH FROM o.order_purchase_timestamp) AS order_month,
p.payment_value
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.payments` AS p
ON o.order_id = p.order_id
WHERE (FORMAT_DATE('%Y-%m',o.order_purchase_timestamp)) BETWEEN '2017-01' AND
'2017-08'
ORDER BY order_month,order_year) AS a),

year_value_2018 AS
(SELECT DISTINCT(order_year),
SUM(payment_value) OVER (PARTITION BY order_year ORDER BY order_year) AS order_sum
FROM(SELECT
EXTRACT(YEAR FROM o.order_purchase_timestamp) AS order_year,
EXTRACT(MONTH FROM o.order_purchase_timestamp) AS order_month,
p.payment_value
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.payments` AS p
ON o.order_id = p.order_id
WHERE (FORMAT_DATE('%Y-%m',o.order_purchase_timestamp)) BETWEEN '2018-01' AND
'2018-08'
ORDER BY order_month,order_year) AS a)

SELECT
CONCAT(ROUND((((year_value_2018.order_sum - year_value_2017.order_sum) /
year_value_2017.order_sum) * 100),2), '%increase') AS perc_increase
FROM year_value_2017, year_value_2018
```



4B)

```
SELECT
  c.customer_state,
  SUM(oi.price) AS sum_of_price,
  AVG(oi.price) AS Mean_of_price,
  SUM(oi.freight_value) AS sum_of_freight_value,
  AVG(oi.freight_value) AS Mean_of_freight_value
FROM `ProjectTarget.order_items` AS oi
JOIN `ProjectTarget.orders` AS o
ON oi.order_id = o.order_id
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
GROUP BY c.customer_state
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH PREVIEW

Row	customer_state	sum_of_price	Mean_of_price	sum_of_freight_value	Mean_of_freight_value
1	SP	5202955.0500027407	109.65362915972931	718723.06999999378	15.147275390419132
2	RJ	1824092.6699996467	125.11781809451907	305589.31000000431	20.960923931682483
3	PR	683083.76000003726	119.00413937282218	117851.68000000058	20.531651567944269
4	SC	520553.34000002244	124.65357758620696	89660.260000000053	21.470368773946323
5	DF	302603.93999999622	125.77054862842866	50625.499999999418	21.041354945968422
6	MG	1585308.0299997134	120.74857414883108	270853.4600000073	20.630166806306651
7	PA	178947.80999999825	165.69241666666659	38699.300000000047	35.832685185185213
8	BA	511349.99000002112	134.60120821268725	100156.67999999922	26.36395893656228
9	GO	294591.94999999512	126.27173167595375	53114.979999999705	22.766815259322772
10	RS	750304.02000004181	120.33745308741014	135522.74000000197	21.735804330392952
11	TO	49621.74000000002	157.52933333333331	11732.679999999998	37.246603174603166
12	AM	22356.840000000029	135.49599999999998	5478.8900000000012	33.205393939393922
13	MA	119648.21999999964	145.20415048543708	31523.77000000004	38.257002427184474
14	PE	262788.02999999444	145.508322259136	59449.659999999873	32.917862679955654

5A)

```
SELECT
order_id,
customer_id,
order_status,
DATE_DIFF(order_estimated_delivery_date, order_purchase_timestamp, DAY) AS
estimated_days,
DATE_DIFF(order_delivered_customer_date,order_purchase_timestamp, DAY) AS
delivery_days
FROM `ProjectTarget.orders`
WHERE order_status IN ('delivered')
```

Row	order_id	customer_id	order_status	estimated_days	delivery_days
1	635c894d068ac37e6e03dc54e...	7a34a8e890765ad6f90db76d0...	delivered	32	30
2	3b97562c3aee8bdedcb5c2e45...	065d53860347d845788e041c...	delivered	33	32
3	68f47f50f04c4cb6774570cfde...	0378e1381c730d4504ebc07d2...	delivered	31	29
4	276e9ec344d3bf029ff83a161c...	d33e520a99eb4cfc0d3ef2b6ff...	delivered	39	43
5	54e1a3c2b97fb0809da548a59...	a0bc11375dd3d8bdd0e0bfcbc...	delivered	36	40
6	fd04fa4105ee8045f6a0139ca5...	8fe0db7abbccaf2d788689e91...	delivered	35	37
7	302bb8109d097a9fc6e9cefc5...	22c0028cdec95ad1808c1fd50...	delivered	28	33
8	66057d37308e787052a32828...	dca924c5e55e17bdba2ad42ae...	delivered	32	38
9	19135c945c554eebfd7576c73...	1c7a9b908094192a2dfae2819...	delivered	33	36
10	4493e45e7ca1084efcd38ddeb...	a1fa003a1a17fc47164251e0e...	delivered	33	34
11	70c77e51e0f179d75a64a6141...	f5c36ac199073a62861ebda86...	delivered	31	42
12	d7918e406132d7c81f1b84527...	53504e2e5940107ff1e2e52a0...	delivered	31	35
13	43f6604e77ce6433e7d68dd86...	ff1201e402a4b1a1bfae1d0abf...	delivered	25	32
14	37073d851c3f30deebe598e5a...	2128bfdcc221a8085d9532893...	delivered	22	31
15	d064d4d070d914984df257750...	897d0a8c75b989370dca7f88b...	delivered	28	29
16	61d430273ff1e88f2944acb53e...	345a9015c65f954a3828232dc...	delivered	30	30
17	d2f8ef9dd1714fcac7de9f0aef1...	04a2fa019514345f6bcc37c89...	delivered	21	30
18	81279a15416799e6580df60f6...	344e198d67bfd80dc6c1eee85...	delivered	18	31
19	c429654419aacfe84ec52dd4c...	4f6d65038bd393dd461e0f8e7f...	delivered	17	36

5B)

```
SELECT
order_purchase_timestamp,
order_delivered_customer_date,
order_estimated_delivery_date,
DATE_DIFF(order_delivered_customer_date,order_purchase_timestamp,DAY) AS
time_to_Delivery,
DATE_DIFF(order_estimated_delivery_date,order_delivered_customer_date,DAY) AS
diff_estimated_delivery
FROM `ProjectTarget.orders`
WHERE order_status = 'delivered'
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH PREVIEW

Row	order_purchase_timestamp	order_delivered_customer_date	order_estimated_delivery_date	time_to_Delivery	diff_estimated_d
37	2018-05-11 09:51:37 UTC	2018-06-20 15:28:43 UTC	2018-06-06 00:00:00 UTC	40	-14
38	2018-05-04 15:21:06 UTC	2018-06-18 12:19:28 UTC	2018-06-06 00:00:00 UTC	44	-12
39	2018-05-15 21:21:58 UTC	2018-06-20 21:32:54 UTC	2018-06-06 00:00:00 UTC	36	-14
40	2017-10-24 15:15:58 UTC	2017-12-06 18:41:34 UTC	2017-11-10 00:00:00 UTC	43	-26
41	2017-10-17 12:33:34 UTC	2017-11-17 19:46:38 UTC	2017-11-10 00:00:00 UTC	31	-7
42	2017-10-22 12:23:20 UTC	2017-11-22 23:17:39 UTC	2017-11-10 00:00:00 UTC	31	-12
43	2017-10-06 19:51:19 UTC	2017-11-10 22:57:50 UTC	2017-11-10 00:00:00 UTC	35	0
44	2017-10-22 10:17:43 UTC	2017-12-27 21:06:58 UTC	2017-11-10 00:00:00 UTC	66	-47
45	2017-10-05 22:27:21 UTC	2017-11-13 20:26:54 UTC	2017-11-10 00:00:00 UTC	38	-3
46	2017-10-07 09:50:07 UTC	2017-11-28 22:24:42 UTC	2017-11-10 00:00:00 UTC	52	-18
47	2017-10-13 16:52:15 UTC	2017-12-20 14:32:58 UTC	2017-11-10 00:00:00 UTC	67	-40
48	2017-10-19 14:53:22 UTC	2017-11-28 22:37:03 UTC	2017-11-10 00:00:00 UTC	40	-18
49	2017-10-14 12:45:05 UTC	2017-11-29 17:32:27 UTC	2017-11-10 00:00:00 UTC	46	-19
50	2017-10-17 10:04:01 UTC	2017-11-17 15:58:59 UTC	2017-11-10 00:00:00 UTC	31	-7

5C)

```
SELECT
c.customer_state,
COUNT(o.order_id) as count_orders,
AVG(oi.freight_value) as avg_freight,
AVG(DATE_DIFF(o.order_delivered_customer_date,o.order_purchase_timestamp,DAY)) AS
avg_time_to_delivery,
AVG(DATE_DIFF(o.order_estimated_delivery_date,o.order_delivered_customer_date,DAY)) AS
avg_diff_estimated_delivery
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
JOIN `ProjectTarget.order_items` AS oi
ON o.order_id = oi.order_id
WHERE order_status IN ('delivered')
GROUP BY c.customer_state
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH PREVIEW

Row	customer_state	count_orders	avg_freight	avg_time_to_delivery	avg_diff_estimated_delivery
1	GO	2277	22.562867808519979	14.948177426438281	11.372859025032927
2	SP	46448	15.115182354460844	8.2596627979587751	10.264141599018073
3	RS	6134	21.613192044343041	14.708299364095817	13.203000163052323
4	BA	3683	26.487556339940287	18.774640238935675	10.119467825142538
5	MG	12916	20.626342520904313	11.514091049860689	12.399039950449046
6	MT	1037	27.996914175506259	17.508196721311482	13.639344262295094
7	RJ	14143	20.911436046100611	14.6888213250371	11.139645054090357
8	SC	4097	21.507359043202353	14.517207712960719	10.664632658042438
9	SE	375	36.573173333333358	20.978666666666651	9.1653333333333276
10	PE	1746	32.693333333333278	17.792096219931292	12.552119129438733
11	TO	310	37.435032258064496	17.003225806451624	11.461290322580641
12	CE	1426	32.734495091164128	20.537166900420793	10.256661991584851
13	PR	5649	20.471816250663817	11.480793060718735	12.533899805275263

5E)

```
SELECT
c.customer_state,
COUNT(o.order_id) as count_orders,
AVG(oi.freight_value) as avg_freight,
AVG(DATE_DIFF(o.order_delivered_customer_date,o.order_purchase_timestamp,DAY)) AS
avg_time_to_delivery,
AVG(DATE_DIFF(o.order_estimated_delivery_date,o.order_delivered_customer_date,DAY)) AS
avg_diff_estimated_delivery
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
JOIN `ProjectTarget.order_items` AS oi
ON o.order_id = oi.order_id
WHERE order_status IN ('delivered')
GROUP BY c.customer_state
ORDER BY avg_freight
LIMIT 5
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	customer_state	count_orders	avg_freight	avg_time_to_del	avg_diff_estimat
1	SP	46448	15.1151823...	8.25966279...	10.2641415...
2	PR	5649	20.4718162...	11.4807930...	12.5338998...
3	MG	12916	20.6263425...	11.5140910...	12.3990399...
4	RJ	14143	20.9114360...	14.6888213...	11.1396450...
5	DF	2355	21.0721613...	12.5014861...	11.2747346...

Top 5 Lowest:

```
SELECT
c.customer_state,
COUNT(o.order_id) as count_orders,
AVG(oi.freight_value) as avg_freight,
AVG(DATE_DIFF(o.order_delivered_customer_date,o.order_purchase_timestamp,DAY)) AS
avg_time_to_delivery,
```

```sql
AVG(DATE_DIFF(o.order_estimated_delivery_date,o.order_delivered_customer_date,DAY)) AS
avg_diff_estimated_delivery
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
JOIN `ProjectTarget.order_items` AS oi
ON o.order_id = oi.order_id
WHERE order_status IN ('delivered')
GROUP BY c.customer_state
ORDER BY avg_freight DESC
LIMIT 5
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	customer_state	count_orders	avg_freight	avg_time_to_del	avg_diff_estimat
1	PB	586	43.0916894...	20.1194539...	12.1501706...
2	RR	46	43.0880434...	27.8260869...	17.4347826...
3	RO	273	41.3305494...	19.2820512...	19.0805860...
4	AC	91	40.0479120...	20.3296703...	20.0109890...
5	PI	523	39.1150860...	18.9311663...	10.6826003...

5F)

```
WITH CT AS

(SELECT
c.customer_state,
COUNT(o.order_id) as count_orders,
AVG(oi.freight_value) as avg_freight,
AVG(DATE_DIFF(o.order_delivered_customer_date,o.order_purchase_timestamp,DAY)) AS
avg_time_to_delivery ,
AVG(DATE_DIFF(o.order_estimated_delivery_date,o.order_delivered_customer_date,DAY)) AS
avg_diff_estimated_delivery,
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
JOIN `ProjectTarget.order_items` AS oi
ON o.order_id = oi.order_id
WHERE order_status IN ('delivered')
GROUP BY c.customer_state)


SELECT *,
FROM CT
ORDER BY avg_time_to_delivery ASC
LIMIT 5;
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTION GRAPH | PRE

Row	customer_state	count_orders	avg_freight	avg_time_to_del	avg_diff_estimat
1	SP	46448	15.1151823...	8.25966279...	10.2641415...
2	PR	5649	20.4718162...	11.4807930...	12.5338998...
3	MG	12916	20.6263425...	11.5140910...	12.3990399...
4	DF	2355	21.0721613...	12.5014861...	11.2747346...
5	SC	4097	21.5073590...	14.5172077...	10.6646326...

5G)

```
WITH CT AS
(SELECT
c.customer_state,
COUNT(o.order_id) as count_orders,
AVG(oi.freight_value) as avg_freight,
AVG(DATE_DIFF(o.order_delivered_customer_date,o.order_purchase_timestamp,DAY)) AS
avg_time_to_delivery ,
AVG(DATE_DIFF(o.order_estimated_delivery_date,o.order_delivered_customer_date,DAY)) AS
avg_diff_estimated_delivery,
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.customers` AS c
ON o.customer_id = c.customer_id
JOIN `ProjectTarget.order_items` AS oi
ON o.order_id = oi.order_id
WHERE order_status IN ('delivered')
GROUP BY c.customer_state)

SELECT
customer_state,
count_orders,
avg_freight,
avg_diff_estimated_delivery
FROM CT
ORDER BY avg_diff_estimated_delivery DESC
LIMIT 5
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXECUTI

Row	customer_state	count_orders	avg_freight	avg_diff_estimat
1	AC	91	40.0479120...	20.0109890...
2	RO	273	41.3305494...	19.0805860...
3	AM	163	33.3106134...	18.9754601...
4	AP	81	34.1604938...	17.4444444...
5	RR	46	43.0880434...	17.4347826...

6A)

```
SELECT
FORMAT_DATE('%Y-%m',o.order_purchase_timestamp) AS month,
p.payment_type,
COUNT(DISTINCT o.order_id) AS order_count
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.payments` AS p
ON o.order_id = p.order_id
GROUP BY month,p.payment_type
ORDER BY month,p.payment_type
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS | EXEC

Row	month	payment_type	order_count
1	2016-09	credit_card	3
2	2016-10	credit_card	253
3	2016-10	debit_card	2
4	2016-10	UPI	63
5	2016-10	voucher	11
6	2016-12	credit_card	1
7	2017-01	credit_card	582
8	2017-01	debit_card	9
9	2017-01	UPI	197
10	2017-01	voucher	33
11	2017-02	credit_card	1347
12	2017-02	debit_card	13
13	2017-02	UPI	398
14	2017-02	voucher	69
15	2017-03	credit_card	2008

6B)

```sql
SELECT
payment_installments,
COUNT(DISTINCT o.order_id) AS order_count
FROM `ProjectTarget.orders` AS o
JOIN `ProjectTarget.payments` AS p
ON o.order_id = p.order_id
GROUP BY payment_installments
ORDER BY payment_installments, order_count
```

Query results

JOB INFORMATION | RESULTS

Row	payment_installments	order_count
1	0	2
2	1	49060
3	2	12389
4	3	10443
5	4	7088
6	5	5234
7	6	3916
8	7	1623
9	8	4253
10	9	644
11	10	5315
12	11	23
13	12	133
14	13	16
15	14	15
16	15	74
17	16	5
18	17	8