

```
mysql> -- MySQL Workbench Forward Engineering
mysql>
mysql> SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS,
FOREIGN_KEY_CHECKS=0;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SET @OLD_SQL_MODE=@@SQL_MODE,
SQL_MODE='TRADITIONAL,ALLOW_INVALID_DATES';
Query OK, 0 rows affected (0.00 sec)
```

```
mysql>
mysql> -- -----
mysql> -- Schema mydb
mysql> -- -----
mysql>
mysql> -- -----
mysql> -- Schema mydb
mysql> -- -----
mysql> CREATE SCHEMA IF NOT EXISTS `mydb` DEFAULT CHARACTER SET utf8 ;
Query OK, 1 row affected, 1 warning (0.00 sec)
```

```
mysql> USE `mydb` ;
Database changed
mysql>
mysql> -- -----
mysql> -- Table `mydb`.`sales`
mysql> -- -----
mysql> CREATE TABLE IF NOT EXISTS `mydb`.`sales` (
  -> `year` INT NOT NULL,
  -> `country` VARCHAR(45) NOT NULL,
  -> `product` VARCHAR(45) NOT NULL,
  -> `profit` INT(15) NOT NULL,
  -> PRIMARY KEY (`year`, `country`, `product`))
  -> ENGINE = InnoDB;
Query OK, 0 rows affected (0.64 sec)
```

```
mysql>
mysql>
mysql> SET SQL_MODE=@OLD_SQL_MODE;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql>
mysql> -- -----
mysql> -- Data for table `mydb`.`sales`
mysql> -- -----
mysql> START TRANSACTION;
Query OK, 0 rows affected (0.00 sec)

mysql> USE `mydb`;
Database changed
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2018,
'india', 'shoes', 10);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2017,
'india', 'milk', 15);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015,
'india', 'shirt', 20);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015,
'india', 'laptop', 54);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2014,
'india', 'bag', 5);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2010,
'india', 'bottle', 20);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2014,
'japan', 'shoes', 45);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015,
'japan', 'milk', 60);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015,
'japan', 'laptop', 30);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2017,
'japan', 'bag', 12);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2018,
'japan', 'bottle', 30);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2010, 'japan', 'scarf', 40);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'newyork', 'shoes', 54);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2019, 'newyork', 'milk', 20);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2012, 'newyork', 'laptop', 51);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2019, 'newyork', 'bag', 54);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'newyork', 'watch', 71);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2016, 'newyork', 'scarf', 21);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'spain', 'shoes', 40);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'spain', 'milk', 25);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'spain', 'laptop', 60);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2016, 'spain', 'bag', 40);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2015, 'spain', 'bottle', 30);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO `mydb`.`sales` (`year`, `country`, `product`, `profit`) VALUES (2014, 'spain', 'keyboard', 35);  
Query OK, 1 row affected (0.00 sec)
```

```
mysql>
mysql> COMMIT;
```

```
mysql> use mydb;
Database changed
mysql> show tables;
```

```
+-----+
| Tables_in_mydb |
+-----+
| sales          |
+-----+
1 row in set (0.00 sec)
```

```
mysql> select * from sales;
```

```
+-----+-----+-----+-----+
| year | country | product | profit |
+-----+-----+-----+-----+
| 2010 | india   | bottle  | 20      |
| 2010 | japan   | scarf   | 40      |
| 2012 | newyork | laptop  | 51      |
| 2014 | india   | bag     | 5        |
| 2014 | japan   | shoes   | 45      |
| 2014 | spain   | keyboard | 35      |
| 2015 | india   | laptop  | 54      |
| 2015 | india   | shirt   | 20      |
| 2015 | japan   | laptop  | 30      |
| 2015 | japan   | milk    | 60      |
| 2015 | newyork | shoes   | 54      |
| 2015 | newyork | watch   | 71      |
| 2015 | spain   | bottle  | 30      |
| 2015 | spain   | laptop  | 60      |
| 2015 | spain   | milk    | 25      |
| 2015 | spain   | shoes   | 40      |
| 2016 | newyork | scarf   | 21      |
| 2016 | spain   | bag     | 40      |
| 2017 | india   | milk    | 15      |
| 2017 | japan   | bag     | 12      |
| 2018 | india   | shoes   | 10      |
| 2018 | japan   | bottle  | 30      |
| 2019 | newyork | bag     | 54      |
| 2019 | newyork | milk    | 20      |
+-----+-----+-----+-----+
24 rows in set (0.00 sec)
```

```
mysql> select year,sum(profit) from sales group by YEAR;
```

```
+-----+-----+
| year | sum(profit) |
+-----+-----+
| 2010 | 60          |
| 2012 | 51          |
| 2014 | 85          |
```

2015	444
2016	61
2017	27
2018	40
2019	74

+-----+-----+

8 rows in set (0.01 sec)

mysql> mysql> select year,sum(profit) from sales group by YEAR with rollup;

+-----+-----+

year	sum(profit)
------	-------------

+-----+-----+

2010	60
2012	51
2014	85
2015	444
2016	61
2017	27
2018	40
2019	74
NULL	842

+-----+-----+

9 rows in set (0.01 sec)

mysql>

mysql>

mysql>

mysql> select year,country,sum(profit) from sales group by year,country with rollup;

+-----+-----+-----+

year	country	sum(profit)
------	---------	-------------

+-----+-----+-----+

2010	india	20
2010	japan	40
2010	NULL	60
2012	newyork	51
2012	NULL	51
2014	india	5
2014	japan	45
2014	spain	35
2014	NULL	85
2015	india	74
2015	japan	90
2015	newyork	125
2015	spain	155
2015	NULL	444
2016	newyork	21
2016	spain	40
2016	NULL	61
2017	india	15
2017	japan	12
2017	NULL	27
2018	india	10

2018   japan	30
2018   NULL	40
2019   newyork	74
2019   NULL	74
NULL   NULL	842

+-----+-----+-----+

26 rows in set (0.00 sec)

mysql> select year,country,sum(profit) from sales group by country,year with rollup;

year   country   sum(profit)
------------------------------

+-----+-----+-----+

2010   india	20
2014   india	5
2015   india	74
2017   india	15
2018   india	10
NULL   india	124
2010   japan	40
2014   japan	45
2015   japan	90
2017   japan	12
2018   japan	30
NULL   japan	217
2012   newyork	51
2015   newyork	125
2016   newyork	21
2019   newyork	74
NULL   newyork	271
2014   spain	35
2015   spain	155
2016   spain	40
NULL   spain	230
NULL   NULL	842

+-----+-----+-----+

22 rows in set (0.00 sec)

mysql> select year,country,product,sum(profit) from sales group by year,country,product with rollup;

year   country   product   sum(profit)
--

+-----+-----+-----+

2010   india   bottle	20
2010   india   NULL	20
2010   japan   scarf	40
2010   japan   NULL	40
2010   NULL   NULL	60
2012   newyork   laptop	51
2012   newyork   NULL	51
2012   NULL   NULL	51
2014   india   bag	5
2014   india   NULL	5

2014	japan	shoes	45
2014	japan	NULL	45
2014	spain	keyboard	35
2014	spain	NULL	35
2014	NULL	NULL	85
2015	india	laptop	54
2015	india	shirt	20
2015	india	NULL	74
2015	japan	laptop	30
2015	japan	milk	60
2015	japan	NULL	90
2015	newyork	shoes	54
2015	newyork	watch	71
2015	newyork	NULL	125
2015	spain	bottle	30
2015	spain	laptop	60
2015	spain	milk	25
2015	spain	shoes	40
2015	spain	NULL	155
2015	NULL	NULL	444
2016	newyork	scarf	21
2016	newyork	NULL	21
2016	spain	bag	40
2016	spain	NULL	40
2016	NULL	NULL	61
2017	india	milk	15
2017	india	NULL	15
2017	japan	bag	12
2017	japan	NULL	12
2017	NULL	NULL	27
2018	india	shoes	10
2018	india	NULL	10
2018	japan	bottle	30
2018	japan	NULL	30
2018	NULL	NULL	40
2019	newyork	bag	54
2019	newyork	milk	20
2019	newyork	NULL	74
2019	NULL	NULL	74
NULL	NULL	NULL	842

+-----+-----+-----+-----+

50 rows in set (0.00 sec)

```
mysql> select country,product,sum(profit) from sales group by country,product with rollup;
```

country	product	sum(profit)
india	bag	5
india	bottle	20
india	laptop	54
india	milk	15
india	shirt	20

india	shoes		10	
india	NULL		124	
japan	bag		12	
japan	bottle		30	
japan	laptop		30	
japan	milk		60	
japan	scarf		40	
japan	shoes		45	
japan	NULL		217	
newyork	bag		54	
newyork	laptop		51	
newyork	milk		20	
newyork	scarf		21	
newyork	shoes		54	
newyork	watch		71	
newyork	NULL		271	
spain	bag		40	
spain	bottle		30	
spain	keyboard		35	
spain	laptop		60	
spain	milk		25	
spain	shoes		40	
spain	NULL		230	
NULL	NULL		842	

+-----+-----+-----+-----+

29 rows in set (0.00 sec)

mysql> select \* from sales where year=2017;

+-----+-----+-----+-----+
year   country   product   profit
+-----+-----+-----+-----+
2017   india   milk   15
2017   japan   bag   12
+-----+-----+-----+-----+

2 rows in set (0.00 sec)

mysql> select year,country,product,sum(profit) from sales where (country='india' or country='spain') and (year=2017 or year=2015) group by year,country,product with rollup;

+-----+-----+-----+-----+
year   country   product   sum(profit)
+-----+-----+-----+-----+
2015   india   laptop   54
2015   india   shirt   20
2015   india   NULL   74
2015   spain   bottle   30
2015   spain   laptop   60
2015   spain   milk   25
2015   spain   shoes   40
2015   spain   NULL   155
2015   NULL   NULL   229
2017   india   milk   15
2017   india   NULL   15



```
| 2017 | NULL | NULL | 15 |
| NULL | NULL | NULL | 244 |
+-----+-----+-----+-----+
13 rows in set (0.00 sec)
```

mysql> select year, country, product, sum(profit) from sales where (country='india' or country='spain') and (year=2017 or year=2015) group by year, country, product with rollup;

```
+-----+-----+-----+-----+
| year | country | product | sum(profit) |
+-----+-----+-----+-----+
| 2015 | india | laptop | 54 |
| 2015 | india | shirt | 20 |
| 2015 | india | NULL | 74 |
| 2015 | spain | bottle | 30 |
| 2015 | spain | laptop | 60 |
| 2015 | spain | milk | 25 |
| 2015 | spain | shoes | 40 |
| 2015 | spain | NULL | 155 |
| 2015 | NULL | NULL | 229 |
| 2017 | india | milk | 15 |
| 2017 | india | NULL | 15 |
| 2017 | NULL | NULL | 15 |
| NULL | NULL | NULL | 244 |
+-----+-----+-----+-----+
13 rows in set (0.01 sec)
```

```
mysql> select country, sum(if(product='bottle',profit,NULL)) as 'bottle',
-> sum(if(product='scarf',profit,NULL)) as 'scarf',
-> sum(if(product='laptop',profit,NULL)) as 'laptop',
-> sum(if(product='bag',profit,NULL)) as 'bag',
-> sum(if(product='shoes',profit,NULL)) as 'shoes',
-> sum(if(product='keyboard',profit,NULL)) as 'keyboard',
-> sum(if(product='shirt',profit,NULL)) as 'shirt',
-> sum(if(product='milk',profit,NULL)) as 'milk',
-> sum(if(product='watch',profit,NULL)) as 'watch'
-> from sales
-> group by country;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| country | bottle | scarf | laptop | bag | shoes | keyboard | shirt | milk | watch |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| india | 20 | NULL | 54 | 5 | 10 | NULL | 20 | 15 | NULL |
| japan | 30 | 40 | 30 | 12 | 45 | NULL | NULL | 60 | NULL |
| newyork | NULL | 21 | 51 | 54 | 54 | NULL | NULL | 20 | 71 |
| spain | 30 | NULL | 60 | 40 | 40 | 35 | NULL | 25 | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> select country as '', sum(if(product='bottle',profit,NULL)) as 'bottle',
sum(if(product='scarf',profit,NULL)) as 'scarf', sum(if(product='laptop',profit,NULL)) as 'laptop',
sum(if(product='bag',profit,NULL)) as 'bag', sum(if(product='shoes',profit,NULL)) as 'shoes',
sum(if(product='keyboard',profit,NULL)) as 'keyboard', sum(if(product='shirt',profit,NULL)) as
```

'shirt', sum(if(product='milk',profit,NULL)) as 'milk', sum(if(product='watch',profit,NULL)) as 'watch' from sales group by country;

	bottle	scarf	laptop	bag	shoes	keyboard	shirt	milk	watch
india	20	NULL	54	5	10	NULL	20	15	NULL
japan	30	40	30	12	45	NULL	NULL	60	NULL
newyork	NULL	21	51	54	54	NULL	NULL	20	71
spain	30	NULL	60	40	40	35	NULL	25	NULL

4 rows in set, 1 warning (0.00 sec)