

- Задание №1

```
CREATE TABLE tbl1
```

```
(
  UserID UInt64,
  PageViews UInt8,
  Duration UInt8,
  Sign Int8,
  Version UInt8
```

)
ENGINE = <ENGINE>

```
INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, -1, 1);
```

```
INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, 1, 1), (4324182021466249494, 6, 185, 1, 2);
```

```
SELECT * FROM tbl1;
```

UserID	PageViews	Duration	Sign	Version
4324182021466249494	5	146	1	1
4324182021466249494	6	185	1	2

UserID	PageViews	Duration	Sign	Version
4324182021466249494	5	146	-1	1

```
SELECT * FROM tbl1 final;
```

UserID	PageViews	Duration	Sign	Version
4324182021466249494	6	185	1	2

```

CREATE TABLE tbl1
(
    UserID UInt64,
    PageViews UInt8,
    Duration UInt8,
    Sign Int8,
    Version UInt8
)
ENGINE = VersionedCollapsingMergeTree(Sign, Version)
ORDER BY UserID;

INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, -1, 1);
INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, 1, 1), (4324182021466249494, 6, 185, 1, 2);

SELECT * FROM tbl1;

```

	123 UserID	123 PageViews	123 Duration	123 Sign	123 Version
1	4,324,182,021,466,249,494	5	146	1	1
2	4,324,182,021,466,249,494	6	185	1	2
3	4,324,182,021,466,249,494	5	146	-1	1

```

CREATE TABLE tbl1
(
    UserID UInt64,
    PageViews UInt8,
    Duration UInt8,
    Sign Int8,
    Version UInt8
)
ENGINE = VersionedCollapsingMergeTree(Sign, Version)
ORDER BY UserID;

INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, -1, 1);
INSERT INTO tbl1 VALUES (4324182021466249494, 5, 146, 1, 1),(4324182021466249494, 6, 185, 1, 2);

SELECT * FROM tbl1 final;

```

tbl1 1 x

SELECT * FROM tbl1 final Enter a SQL expression to filter results (use Ctrl+Space)

	123 UserID	123 PageViews	123 Duration	123 Sign	123 Version
1	4,324,182,021,466,249,494	6	185	1	2

Выбрана версия движка «VersionedCollapsingMergeTree», поскольку в таблице и в загружаемых данных используются поля «Sign» и «Version»

- Задание №2

```

CREATE TABLE tbl2
(
    key UInt32,
    value UInt32
)
ENGINE = <ENGINE>
ORDER BY key;

```

```
INSERT INTO tbl2 Values(1,1),(1,2),(2,1);
```

```
select * from tbl2;
```

key	value
1	3
2	1

```

CREATE TABLE tbl2
(
    key UInt32,
    value UInt32
)
ENGINE = SummingMergeTree(value)
ORDER BY key;

INSERT INTO tbl2 Values(1,1),(1,2),(2,1);

select * from tbl2;

```

tbl2 1 x

select * from tbl2 Enter a SQL expression to filter results (use Ct

	123 key	123 value
1	1	3
2	2	1

Выбрана версия движка «SummingMergeTree», поскольку структура таблицы, представленный результат и загружаемые данные подходят только для данного типа движка

- Задание №3

```
CREATE TABLE tbl3
(
  `id` Int32,
  `status` String,
  `price` String,
  `comment` String
)
ENGINE = <ENGINE>
PRIMARY KEY (id)
ORDER BY (id, status);

INSERT INTO tbl3 VALUES (23, 'success', '1000', 'Confirmed');
INSERT INTO tbl3 VALUES (23, 'success', '2000', 'Cancelled');

SELECT * from tbl3 WHERE id=23;
```

id	status	price	comment
23	success	2000	Cancelled

id	status	price	comment
23	success	1000	Confirmed

```
SELECT * from tbl3 FINAL WHERE id=23;
```

id	status	price	comment
23	success	2000	Cancelled

The screenshot shows a SQL IDE interface. The top pane contains the following SQL code:

```
CREATE TABLE tbl3
(
  `id` Int32,
  `status` String,
  `price` String,
  `comment` String
)
ENGINE = ReplacingMergeTree
PRIMARY KEY (id)
ORDER BY (id, status);

INSERT INTO tbl3 VALUES (23, 'success', '1000', 'Confirmed');
INSERT INTO tbl3 VALUES (23, 'success', '2000', 'Cancelled');

SELECT * from tbl3 WHERE id=23;
```

The bottom pane shows the results of the query in a table grid. The grid has columns for 'id', 'status', 'price', and 'comment'. The first row shows '23', 'success', '1000', 'Confirmed'. The second row shows '23', 'success', '2000', 'Cancelled'.

id	status	price	comment
23	success	1000	Confirmed
23	success	2000	Cancelled

```

CREATE TABLE tbl3
(
    `id` Int32,
    `status` String,
    `price` String,
    `comment` String
)
ENGINE = ReplacingMergeTree
PRIMARY KEY (id)
ORDER BY (id, status);

INSERT INTO tbl3 VALUES (23, 'success', '1000', 'Confirmed');
INSERT INTO tbl3 VALUES (23, 'success', '2000', 'Cancelled');

SELECT * from tbl3 FINAL WHERE id=23;

```

Table tbl3 not found

tbl3 1	123 id	A-Z status	A-Z price	A-Z comment
1	23	success	2000	Cancelled

Выбрана версия движка «ReplacingMergeTree», поскольку структура таблицы, представленный результат и загружаемые данные подходят только для данного типа движка

- Задание №4

```

CREATE TABLE tbl4
(
    CounterID UInt8,
    StartDate Date,
    UserID UInt64
) ENGINE = <ENGINE>
PARTITION BY toYYYYMM(StartDate)
ORDER BY (CounterID, StartDate);

INSERT INTO tbl4 VALUES(0, '2019-11-11', 1);
INSERT INTO tbl4 VALUES(1, '2019-11-12', 1);

```

```

CREATE TABLE tbl5
(
    CounterID UInt8,
    StartDate Date,
    UserID AggregateFunction(uniq, UInt64)
) ENGINE = <ENGINE>
PARTITION BY toYYYYMM(StartDate)
ORDER BY (CounterID, StartDate);

INSERT INTO tbl5
select CounterID, StartDate, uniqState(UserID)
from tbl4
group by CounterID, StartDate;

```

```
INSERT INTO tbl5 VALUES (1,'2019-11-12',1);
```

```

Exception on client:
Code: 53. DB::Exception: Cannot convert UInt64 to AggregateFunction(uniq, UInt64): While executing ValuesBlockInputFormat: data for INSERT was parsed from query. (TYPE_MISMATCH)

```

```

SELECT uniqMerge(UserID) AS state
FROM tbl5
GROUP BY CounterID, StartDate;

```

```

state
1
1

```

```

CREATE TABLE tbl4
(
  CounterID UInt8,
  StartDate Date,
  UserID UInt64
) ENGINE = MergeTree
PARTITION BY toYYYYMM(StartDate)
ORDER BY (CounterID, StartDate);

INSERT INTO tbl4 VALUES(0, '2019-11-11', 1);
INSERT INTO tbl4 VALUES(1, '2019-11-12', 1);

CREATE TABLE tbl5
(
  CounterID UInt8,
  StartDate Date,
  UserID AggregateFunction(uniq, UInt64)
) ENGINE = AggregatingMergeTree
PARTITION BY toYYYYMM(StartDate)
ORDER BY (CounterID, StartDate);

INSERT INTO tbl5
select CounterID, StartDate, uniqState(UserID)
from tbl4
group by CounterID, StartDate;

INSERT INTO tbl5 VALUES (1, '2019-11-12', 1);

SELECT uniqMerge(UserID) AS state
FROM tbl5
GROUP BY CounterID, StartDate;

```

tbl5 1 x

SELECT uniqMerge(UserID) AS state FROM tbl5 GROUP BY CounterID, StartDate;

Grid	123 state
1	1
2	1

Для таблицы «tbl4» выбрана версия движка «MergeTree» чтобы данные просто добавлялись. Для таблицы «tbl5» выбрана версия «AggregatingMergeTree» чтобы можно было применить агрегатную функцию «uniqState»

- Задание №5

```
CREATE TABLE tbl6
```

```
(
  `id` Int32,
  `status` String,
  `price` String,
  `comment` String,
  `sign` Int8
)
```

```
ENGINE = <ENGINE>
```

```
PRIMARY KEY (id)
```

```
ORDER BY (id, status);
```

```
INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', 1);
```

```
INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', -1), (23, 'success', '2000', 'Cancelled', 1);
```

```
SELECT * FROM tbl6;
```

id	status	price	comment	sign
23	success	1000	Confirmed	-1
23	success	2000	Cancelled	1

id	status	price	comment	sign
23	success	1000	Confirmed	1

```
SELECT * FROM tbl6 FINAL;
```

id	status	price	comment	sign
23	success	2000	Cancelled	1

The screenshot shows a database IDE with the following SQL queries in the editor:

```
CREATE TABLE tbl6
(
  `id` Int32,
  `status` String,
  `price` String,
  `comment` String,
  `sign` Int8
)
ENGINE = CollapsingMergeTree(sign)
PRIMARY KEY (id)
ORDER BY (id, status);

INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', 1);
INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', -1), (23, 'success', '2000', 'Cancelled', 1);

SELECT * FROM tbl6;
```

The results pane shows the output of the final query, displaying three rows of data:

	id	status	price	comment	sign
1	23	success	1000	Confirmed	1
2	23	success	1000	Confirmed	-1
3	23	success	2000	Cancelled	1

```

CREATE TABLE tbl6
(
  `id` Int32,
  `status` String,
  `price` String,
  `comment` String,
  `sign` Int8
)
ENGINE = CollapsingMergeTree(sign)
PRIMARY KEY (id)
ORDER BY (id, status);

INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', 1);
INSERT INTO tbl6 VALUES (23, 'success', '1000', 'Confirmed', -1), (23, 'success', '2000', 'Cancelled', 1);

SELECT * FROM tbl6 FINAL;

```

tbl6 1 ×

SELECT * FROM tbl6 FINAL Enter a SQL expression to filter results (use Ctrl+Space)

	123 id	A-Z status	A-Z price	A-Z comment	123 sign
1	23	success	2000	Cancelled	1

Выбрана версия движка «CollapsingMergeTree», поскольку структура таблицы, представленный результат и загружаемые данные подходят только для данного типа движка