Programming Project II

Course: Large Scale Data Management
Student: Vasileios Dimopoulos
Date: 8/3/2024

Part 1 Python Script:

```python
import json
import asyncio
import csv
import random
from datetime import datetime
from aiokafka import AIOKafkaProducer

from faker import Faker

# Create a Faker instance
fake = Faker()

topic = "test"


def serializer(value):
    return json.dumps(value).encode()


def read_random_songs(csv_file, num_songs):
    with open(csv_file, "r", newline="", encoding="utf-8") as file:
        reader = csv.reader(file)
        songs = list(reader)
        first_columns = [row[0] for row in songs]
        random_songs = random.sample(first_columns, num_songs)

    return random_songs


async def produce():
    producer = AIOKafkaProducer(
        bootstrap_servers="localhost:29092",
        value_serializer=serializer,
        compression_type="gzip",
    )

    csv_file_path = "spotify-songs.csv"
```

```
    names = []
    for i in range(10):
        name = fake.name()
        names.append(name)
    names.append("Vasilis Dimopoulos")
    k = 0
    await producer.start()
    for j in range(20):
        user_data = []
        for i in range(11):
            num_random_songs = 11
            songs = read_random_songs(csv_file_path, num_random_songs)
            current_time = datetime.now()
            formatted_time = current_time.strftime("%Y-%m-%d %H:%M:%S")
            data = {
                "id": k,
                "user_name": names[i],
                "song": songs[i],
                "time": formatted_time,
            }
            user_data.append(data)
            k += 1
        for data in user_data:
            await producer.send(topic, data)
        await asyncio.sleep(30)
    await producer.stop()


loop = asyncio.get_event_loop()
result = loop.run_until_complete(produce())
```

Part 2 Python Script:

```
from pyspark.sql import SparkSession
from pyspark.sql.types import (
    StructType,
    StructField,
    IntegerType,
    FloatType,
    StringType,
)
from pyspark.sql.functions import split, from_json, col

songSchema = StructType(
    [
```

```
        StructField("id", IntegerType(), False),
        StructField("user_name", StringType(), False),
        StructField("song", StringType(), False),
        StructField("time", StringType(), False),
    ]
)

csvSchema = StructType(
    [
        StructField("song", StringType(), False),
        StructField("artists", StringType(), False),
        StructField("duration_ms", IntegerType(), False),
        StructField("album_name", StringType(), False),
        StructField("album_release_date", StringType(), False),
        StructField("danceability", FloatType(), False),
        StructField("energy", FloatType(), False),
        StructField("key", IntegerType(), False),
        StructField("loudness", FloatType(), False),
        StructField("mode", IntegerType(), False),
        StructField("speechiness", FloatType(), False),
        StructField("acousticness", FloatType(), False),
        StructField("instrumentalness", FloatType(), False),
        StructField("liveness", FloatType(), False),
        StructField("valence", FloatType(), False),
        StructField("tempo", FloatType(), False),
    ]
)

spark = (
    SparkSession.builder.appName("SSKafka")
    .config("spark.jars.packages", "org.apache.spark:spark-sql-kafka-0-
10_2.12:3.5.0")
    .getOrCreate()
)
spark.sparkContext.setLogLevel("ERROR")

df = (
    spark.readStream.format("kafka")
    .option("kafka.bootstrap.servers", "localhost:29092")
    .option("subscribe", "test")
    .option("startingOffsets", "latest")
    .load()
)

sdf = (
    df.selectExpr("CAST(value AS STRING)")
    .select(from_json(col("value"), songSchema).alias("data"))
    .select("data.*")
```

```
)

sdf = sdf.withColumn("year", col("time").cast("string").substr(1,
4).cast("int"))
sdf = sdf.withColumn("month", col("time").cast("string").substr(6,
2).cast("int"))
sdf = sdf.withColumn("day", col("time").cast("string").substr(9,
2).cast("int"))
sdf = sdf.withColumn("hour", col("time").cast("string").substr(12,
2).cast("int"))
sdf = sdf.withColumn("minute", col("time").cast("string").substr(15,
2).cast("int"))
sdf = sdf.withColumn("second", col("time").cast("string").substr(18,
2).cast("int"))
sdf = sdf.drop("time")

csv_df = spark.read.csv("spotify-songs.csv", header=True,
schema=csvSchema)
enriched_df = sdf.join(csv_df, "song", "left_outer")


def writeToCassandra(writeDF, _):
    writeDF.write.format("org.apache.spark.sql.cassandra").mode("append
").options(
        table="records", keyspace="spotify"
    ).save()


result = None
while result is None:
    try:
        # connect
        result = (
            enriched_df.writeStream.option(
                "spark.cassandra.connection.host", "localhost:9042"
            )
            .foreachBatch(writeToCassandra)
            .outputMode("update")
            .start()
            .awaitTermination()
        )
    except:
        pass
```

Details about your Cassandra data model

Schema:

```
CREATE TABLE spotify.records (
    user_name text,
    year int,
    month int,
    day int,
    hour int,
    song text,
    acousticness float,
    album_name text,
    album_release_date text,
    artists text,
    danceability float,
    duration_ms int,
    energy float,
    id int,
    instrumentalness float,
    key int,
    liveness float,
    loudness float,
    minute int,
    mode int,
    second int,
    speechiness float,
    tempo float,
    valence float,
    PRIMARY KEY (user_name, year, month, day, hour, song)
) WITH CLUSTERING ORDER BY (year ASC, month ASC, day ASC, hour ASC, song ASC)
    AND additional_write_policy = '99p'
    AND bloom_filter_fp_chance = 0.01
    AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
    AND cdc = false
    AND comment = ''
    AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
    AND compression = {'chunk_length_in_kb': '16', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
    AND memtable = 'default'
    AND crc_check_chance = 1.0
    AND default_time_to_live = 0
    AND extensions = {}
    AND gc_grace_seconds = 864000
    AND max_index_interval = 2048
    AND memtable_flush_period_in_ms = 0
    AND min_index_interval = 128
    AND read_repair = 'BLOCKING'
    AND speculative_retry = '99p';
cqlsh>
```

Since we only had only one Cassandra Block (Docker Container) we didn't set any partitioning keys. Just primary keys were enough for the requirements of the assignment's queries.

A sample of persisted lines (around 50) of the Cassandra table

user_name | year | month | day | hour | song | acousticness | album_name | album_release_date | artists | danceability | duration_ms | energy | id | instrumentalness | key | liveness | loudness | minute | mode | second | speechiness | tempo | valence

---

Stephanie Anderson | 2024 | 3 | 8 | 17 | 7 SÜNDEN | 0.387 | 7 SÜNDEN | 2024-01-07 | Tream, treamiboii | 0.682 | 188038 | 0.829 | 67 | 0 | 1 | 0.165 | -5.932 | 30 | 0 | 11 | 0.363 | 168.15601 | 0.537

Stephanie Anderson | 2024 | 3 | 8 | 17 | El Cañonazo | 0.483 | Super Éxitos Maracaibo 15 | 1997-09-01 | Maracaibo 15 | 0.696 | 181226 | 0.843 | 34 | 0 | 1 | 0.101 | -9.929 | 27 | 1 | 57 | 0.0863 | 112.954 | 0.924

Stephanie Anderson | 2024 | 3 | 8 | 17 | El Viejo del Sombrerón | 0.275 | Greatest Cumbia Classics Of Colombia, Vol. 1 | 2015-07-01 | La Sonora Dinamita, La India Meliyará | 0.776 | 252186 | 0.791 | 45 | 1.6e-05 | 5 | 0.143 | -6.551 | 28 | 0 | 44 | 0.0415 | 107.954 | 0.961

Stephanie Anderson | 2024 | 3 | 8 | 17 | Feeling Myself - Roc Boyz Remix | 0.202 | Feeling Myself (Roc Boyz Remix) | 2023-08-10 | 23, Roc Boyz | 0.801 | 182769 | 0.566 | 56 | 0 | 1 | 0.0999 | -7.022 | 29 | 0 | 29 | 0.234 | 130.09599 | 0.642

Stephanie Anderson | 2024 | 3 | 8 | 17 | Home To You (This Christmas) | 0.684 | Home To You (This Christmas) | 2021-11-05 | Sigrid | 0.616 | 225817 | 0.321 | 78 | 0 | 8 | 0.148 | -5.505 | 30 | 1 | 56 | 0.0313 | 139.233 | 0.287

Stephanie Anderson | 2024 | 3 | 8 | 17 | Oceaan | 0.866 | The Singles Collection | 2013-03-15 | Racoon | 0.593 | 164757 | 0.313 | 89 | 0 | 9 | 0.108 | -8.961 | 31 | 1 | 38 | 0.0383 | 95.904 | 0.219

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | Back Die Bokke | 0.00572 | Back Die Bokke | 2019-08-09 | Early B, Justin Vega | 0.928 | 139876 | 0.818 | 41 |

0 | 11 | 0.0959 | -4.121 | 28 | 0 | 6 | 0.0718 | 126.014 | 0.916

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | Carta al Universo | 0.299 | Carta al Universo | 2023-11-10 | Alexa Sotelo | 0.763 | 142500 | 0.671 | 74 |

0.000101 | 11 | 0.238 | -5.469 | 30 | 1 | 21 | 0.164 | 100.124 | 0.368

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | Nonsense | 0.0268 | emails i can't send | 2022-07-15 | Sabrina Carpenter | 0.74 | 163648 | 0.697 | 96 |

0 | 8 | 0.224 | -4.912 | 31 | 1 | 45 | 0.034 | 138.992 | 0.732

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | YO AK | 0.125 | FERXXOCALIPSIS | 2023-12-01 | Feid, Jhay P | 0.778 | 205066 | 0.705 | 52 |

1.26e-06 | 1 | 0.0811 | -4.565 | 28 | 0 | 54 | 0.0649 | 90.964 | 0.591

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | ZAZA PART. 2 | 0.14 | 24 | 2023-12-22 | La Fève | 0.711 | 153468 | 0.461 | 63 |

1e-06 | 4 | 0.191 | -11.041 | 29 | 0 | 36 | 0.0451 | 127.015 | 0.0843

Dr. Sean Gardner | 2024 | 3 | 8 | 17 | kel kel :) | 0.149 | AYAULYM | 2023-11-22 | Ayau | 0.932 | 197500 | 0.588 | 85 |

0.571 | 4 | 0.112 | -7.935 | 31 | 0 | 3 | 0.0603 | 121.988 | 0.813

Andrea Bell | 2024 | 3 | 8 | 17 | El Super Junte Rkt | 0.102 | El Super Junte Rkt | 2023-11-30 | Gusty dj, Salastkbron, Callejero Fino, Alejo Isakk, R Jota, L-Gante, Lolo OG, DobleP, Lauty Gram | 0.849 | 383369 | 0.794 | 93 |

0 | 1 | 0.0813 | -2.595 | 31 | 0 | 42 | 0.127 | 105.002 | 0.567

Andrea Bell | 2024 | 3 | 8 | 17 | Ferrari | 0.0127 | Ferrari | 2022-04-01 | James Hype, Miggy Dela Rosa | 0.847 | 186661 | 0.69 | 82 |

6e-05 | 1 | 0.0526 | -7.877 | 30 | 0 | 59 | 0.0493 | 125.004 | 0.692

Andrea Bell | 2024 | 3 | 8 | 17 | Frate | 0.121 | Club Dogo | 2024-01-12 | Club Dogo | 0.679 | 163621 | 0.831 | 38 |

0 | 3 | 0.229 | -3.989 | 28 | 1 | 3 | 0.312 | 74.861 | 0.787

Andrea Bell | 2024 | 3 | 8 | 17 | Gugguvaktin | 0.0623 | PBT | 2023-05-05 | PATRi!K | 0.894 | 125000 | 0.776 | 49 |

0.367 | 0 | 0.257 | -8.252 | 28 | 0 | 50 | 0.14 | 150.01401 | 0.493

Andrea Bell | 2024 | 3 | 8 | 17 | Skaala | 0.0905 | Kävi Miten Kävi | 2023-06-01 | Isac Elliot | 0.623 | 141735 | 0.729 | 60 |

8.8e-05 | 7 | 0.0906 | -7.659 | 29 | 0 | 33 | 0.0299 | 146.96899 | 0.766

Andrea Bell | 2024 | 3 | 8 | 17 | Tata | 0.771 | Afro Fado | 2023-11-24 | Slow J | 0.571 | 159751 | 0.718 | 71 |

0.0298 | 5 | 0.104 | -4.836 | 30 | 1 | 16 | 0.425 | 92.023 | 0.491

Laura Camacho | 2024 | 3 | 8 | 17 | BHAGWADHARI | 0.282 | BHAGWADHARI | 2022-04-04 | Bucks Boy | 0.759 | 198233 | 0.501 | 53 |

0 | 3 | 0.595 | -5.675 | 28 | 0 | 55 | 0.165 | 77.518 | 0.405

Laura Camacho | 2024 | 3 | 8 | 17 | JPN II | 0.135 | Euphorie | 2023-11-10 | Furelise | 0.779 | 134117 | 0.512 | 64 |

0 | 10 | 0.419 | -9.645 | 29 | 1 | 38 | 0.237 | 135.85699 | 0.343

Laura Camacho | 2024 | 3 | 8 | 17 | Lost | 0.0272 | channel ORANGE | 2012-07-10 | Frank Ocean | 0.913 | 234093 | 0.603 | 97 |

0.000503 | 8 | 0.167 | -4.892 | 31 | 1 | 46 | 0.226 | 123.061 | 0.497

Laura Camacho | 2024 | 3 | 8 | 17 | Superjung | 0.178 | Tage vor 2000 | 2023-12-21 | Pashanim | 0.721 | 169586 | 0.448 | 86 |

0.0881 | 7 | 0.108 | -9.595 | 31 | 1 | 4 | 0.337 | 169.871 | 0.436

Laura Camacho | 2024 | 3 | 8 | 17 | Turné | 0.422 | Turné | 2023-03-17 | Bausa | 0.547 | 174986 | 0.57 | 42 |

9.1e-05 | 3 | 0.319 | -7.673 | 28 | 0 | 8 | 0.0528 | 139.728 | 0.347

Laura Camacho | 2024 | 3 | 8 | 17 | Пьяный дождь | 0.578 | Малый повзрослел, Ч. 2 | 2017-10-27 | Max Korzh | 0.704 | 195532 | 0.332 | 75 |

0 | 9 | 0.101 | -8.24 | 30 | 1 | 23 | 0.0525 | 91.091 | 0.352

Jasmine Rice | 2024 | 3 | 8 | 17 | ERROR 403 | 0.0506 | ERROR 403 | 2023-11-24 | Lu de la Tower, Corona | 0.512 | 149187 | 0.94 | 77 |

0 | 11 | 0.306 | -4.573 | 30 | 0 | 54 | 0.0624 | 174.013 | 0.827

Jasmine Rice | 2024 | 3 | 8 | 17 | Even for a moment | 0.758 | Even for a moment | 2023-10-19 | Sung Si Kyung, Naul | 0.441 | 293160 | 0.455 | 66 |

9e-05 | 2 | 0.233 | -6.608 | 30 | 1 | 10 | 0.0283 | 84.534 | 0.265

Jasmine Rice | 2024 | 3 | 8 | 17 | Malja | 0.451 | Malja | 2022-07-29 | Rasmus Gozzi Finland, Levi-Äijä | 0.461 | 162093 | 0.671 | 33 |

0 | 3 | 0.104 | -8.997 | 27 | 0 | 56 | 0.263 | 163.729 | 0.65

Jasmine Rice | 2024 | 3 | 8 | 17 | Milzīte Ilzīte | 0.335 | Milzīte Ilzīte | 2022-04-11 | Kapteinis Reinis | 0.961 | 180010 | 0.473 | 44 |

1.5e-05 | 7 | 0.0884 | -10.733 | 28 | 1 | 42 | 0.0581 | 102.011 | 0.964

Jasmine Rice | 2024 | 3 | 8 | 17 | Toxic | 0.0249 | In The Zone | 2003-11-13 | Britney Spears | 0.774 | 198800 | 0.838 | 55 |

0.025 | 5 | 0.242 | -3.914 | 29 | 0 | 28 | 0.114 | 143.03999 | 0.924

Jasmine Rice | 2024 | 3 | 8 | 17 | smugryger | 0.162 | smugryger | 2023-03-31 | andreas odbjerg | 0.841 | 163254 | 0.541 | 88 |

2.6e-05 | 8 | 0.0568 | -7.567 | 31 | 0 | 37 | 0.0425 | 140.039 | 0.813

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | Abl Mawsalek | 0.749 | Abl Mawsalek | 2021-08-07 | Muslim - مُسلِم | 98 | 0.323 | 278000 | 0.438 |

1.1e-06 | 4 | 0.106 | -10.903 | 31 | 0 | 47 | 0.0406 | 115.627 | 0.329

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | FREESTYLE | 0.25 | FREESTYLE | 2023-11-07 | FLY LO | 0.858 | 137400 | 0.622 | 76 |

3e-05 | 10 | 0.102 | -11.018 | 30 | 0 | 23 | 0.197 | 100.003 | 0.686

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | GMFU (w/ 6arelyhuman) | 0.00105 | GMFU (w/ 6arelyhuman) | 2023-07-26 | Odetari, 6arelyhuman | 0.735 | 127741 | 0.778 | 65 |

0.025 | 11 | 0.0923 | -3.23 | 29 | 1 | 39 | 0.0487 | 126.091 | 0.278

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | Goeie Man | 0.509 | Wonderland | 2023-11-16 | Kevin | 0.672 | 149368 | 0.514 | 87 |

8.2e-06 | 2 | 0.112 | -10.904 | 31 | 0 | 5 | 0.36 | 90.023 | 0.652

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | Važiuoju Kur Širdis | 0.187 | Verkiu Raudonų Vyšnių Sode | 2024-01-15 | GJan | 0.722 | 225000 | 0.615 | 54 |

4.71e-06 | 2 | 0.369 | -5.154 | 28 | 0 | 57 | 0.038 | 125.002 | 0.785

Vasilis Dimopoulos | 2024 | 3 | 8 | 17 | Ела, Хабиби | 0.143 | Ела, Хабиби | 2023-07-01 | Emilia, Galin | 0.818 | 171400 | 0.79 | 43 |

2.39e-06 | 11 | 0.239 | -2.019 | 28 | 0 | 10 | 0.1 | 149.992 | 0.758

Vincent Anderson | 2024 | 3 | 8 | 17 | Evil Receive | 0.361 | Presido La Pluto | 2023-11-10 | Shallipopi | 0.845 | 231157 | 0.686 | 90 |

0 | 10 | 0.127 | -5.573 | 31 | 0 | 39 | 0.131 | 107.99 | 0.699

Vincent Anderson | 2024 | 3 | 8 | 17 | La ziguezon | 0.488 | Chic & Swell | 1982-01-01 | La Bottine Souriante | 0.896 | 222693 | 0.635 | 68 |

0 | 1 | 0.103 | -12.339 | 30 | 1 | 12 | 0.148 | 104.843 | 0.929

Vincent Anderson | 2024 | 3 | 8 | 17 | Latyo és haze | 0.0732 | Focus | 2023-01-13 | Kain, Ekhoe, Pogány Induló | 0.823 | 153650 | 0.531 | 46 |

0 | 1 | 0.128 | -8.994 | 28 | 1 | 46 | 0.143 | 124.928 | 0.413

Vincent Anderson | 2024 | 3 | 8 | 17 | Meuda | 0.508 | Mélo | 2022-05-27 | Tiakola | 0.724 | 152546 | 0.593 | 57 |

0 | 9 | 0.196 | -6.498 | 29 | 1 | 31 | 0.0766 | 141.901 | 0.624

Vincent Anderson | 2024 | 3 | 8 | 17 | Soy Feo Pero Rico | 0.00927 | De Amor y Vacilón | 2014-07-13 | La Combo Tortuga | 0.738 | 187506 | 0.847 | 35 |

0 | 2 | 0.325 | -4.408 | 27 | 1 | 59 | 0.0812 | 111.962 | 0.826

Vincent Anderson | 2024 | 3 | 8 | 17 | Ya No Somos Ni Seremos | 0.437 | Ya No Somos Ni Seremos | 2022-02-18 | Christian Nodal | 0.588 | 185722 | 0.452 | 79 |

0 | 7 | 0.344 | -4.75 | 30 | 1 | 56 | 0.0268 | 139.953 | 0.734

Lance Wilkinson | 2024 | 3 | 8 | 17 | Beast & Peace | 0.408 | Blessed | 2023-06-30 | Mohbad | 0.551 | 145188 | 0.638 | 47 |

1.77e-06 | 11 | 0.66 | -12.126 | 28 | 1 | 47 | 0.305 | 85.443 | 0.378

Lance Wilkinson | 2024 | 3 | 8 | 17 | Dej bůh štěstí | 0.802 | Vánoční koledy, Vol. 1 (Pokoj lidem dobré vůle) | 2013-11-04 | Dětský sbor Camerata | 0.327 | 67666 | 0.243 | 91 |

0 | 5 | 0.384 | -10.076 | 31 | 1 | 40 | 0.0306 | 87.891 | 0.53

Lance Wilkinson | 2024 | 3 | 8 | 17 | Overdose | 0.0343 | 劇場 | 2023-12-20 | natori | 0.728 | 194106 | 0.696 | 80 |

2.2e-05 | 4 | 0.228 | -6.215 | 30 | 0 | 57 | 0.0324 | 118.027 | 0.836

Lance Wilkinson | 2024 | 3 | 8 | 17 | PARIWO | 0.262 | Blessed | 2023-06-30 | Mohbad, Bella Shmurda | 0.771 | 120439 | 0.636 | 58 |

0.000551 | 7 | 0.153 | -7.731 | 29 | 0 | 32 | 0.0632 | 106.997 | 0.764

Lance Wilkinson | 2024 | 3 | 8 | 17 | Take on Me - Slowed | 0.966 | Take on Me (Slowed) | 2022-06-25 | m3gan | 0.279 | 200288 | 0.0664 | 69 |

0.971 | 8 | 0.149 | -19.479 | 30 | 0 | 13 | 0.0425 | 118.089 | 0.2

Lance Wilkinson | 2024 | 3 | 8 | 17 | Фломастер | 0.0366 | POX VAWË 0.5 | 2023-11-17 | OG Buda, MAYOT | 0.665 | 104000 | 0.696 | 36 |

0.000321 | 9 | 0.0931 | -6.892 | 28 | 0 | 0 | 0.0416 | 150.02699 | 0.534

James Mills | 2024 | 3 | 8 | 17 | 33 | 0.0424 | Back In Town | 2024-01-05 | KERZA | 0.86 | 154303 | 0.576 | 39 |

0.000136 | 0 | 0.176 | -5.655 | 28 | 0 | 4 | 0.0406 | 140.00301 | 0.739

James Mills | 2024 | 3 | 8 | 17 | Dying 2 Live | 0.0344 | VARSKVA | 2023-11-24 | Big Baby Tape | 0.817 | 161684 | 0.839 | 72 |

0 | 0 | 0.1 | -4.871 | 30 | 1 | 18 | 0.0635 | 94.951 | 0.452

Two CQL queries and their results in your database about your own name and a particular hour that generate the average danceability of the songs that you've listened during this hour, and the names of the songs, respectively.

1.

```
cqlsh> SELECT AVG(danceability) AS average_danceability FROM spotify.records WHERE user_name = 'Vasilis Dimopoulos'   AND year = 2024   AND month =
 3   AND day = 8   AND hour = 17;

 average_danceability
----------------------
             0.707167
```

2.

```
cqlsh> SELECT song FROM spotify.records WHERE user_name = 'Vasilis Dimopoulos'   AND year = 2024   AND month = 3   AND day = 8   AND hour = 17;

 song
-----------------------
          Abl Mawsalek
             FREESTYLE
 GMFU (w/ 6arelyhuman)
             Goeie Man
   Važiuoju Kur Širdis
          Ела, Хабиби

(6 rows)
```