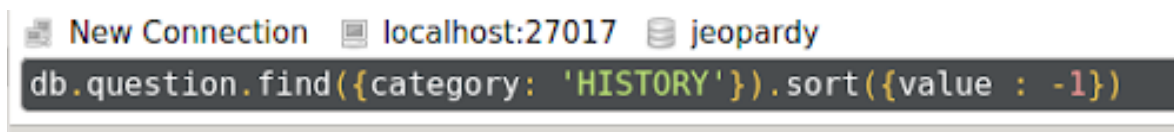


# Sprawozdanie z laboratorium z MongoDB

Krzysztof Makiela

## 1. Zapytania z użyciem konsoli Mongo w Robomongo:

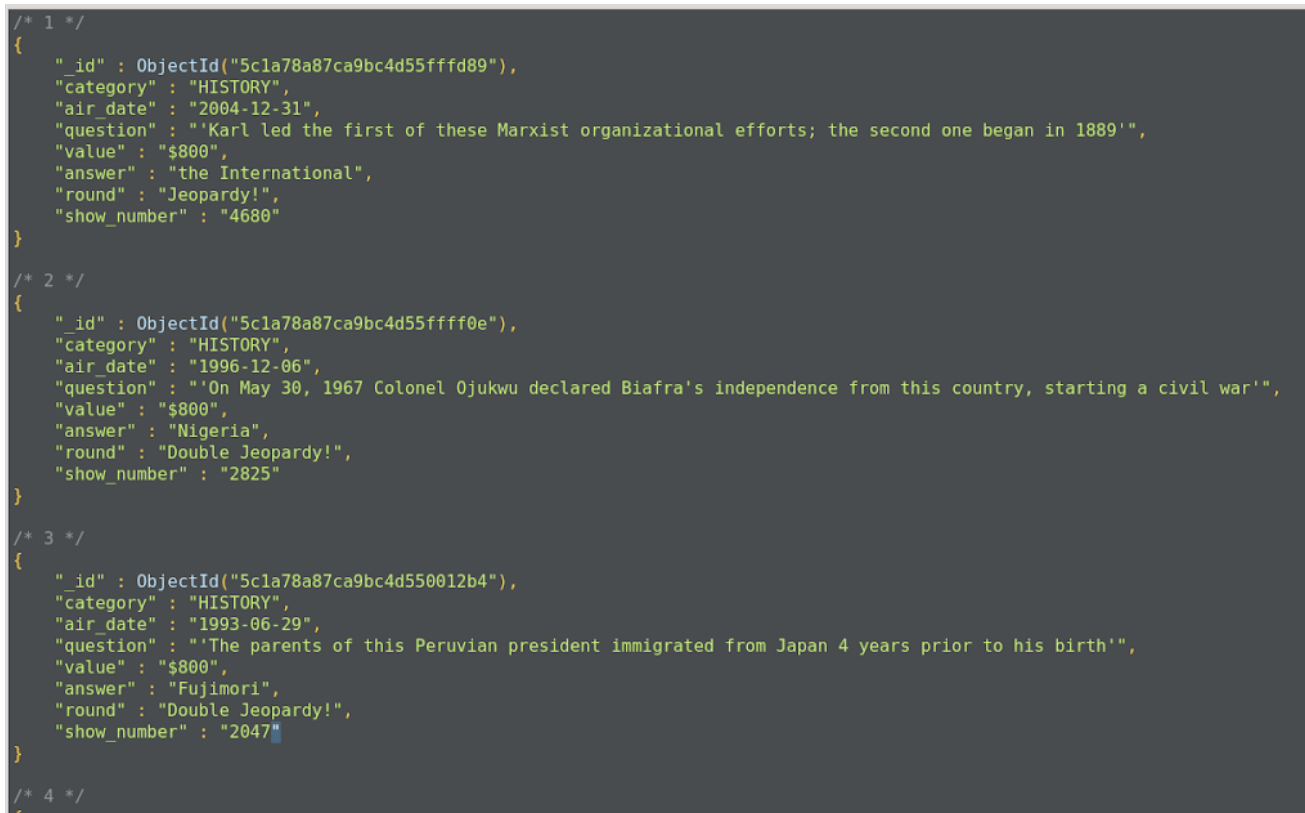
- **Zapytanie proste:** Zbiór wszystkich pytań historycznych posortowanych malejąco według wartości:



New Connection localhost:27017 jeopardy

```
db.question.find({category: 'HISTORY'}).sort({value : -1})
```

Rezultat (pierwsze kilka wyników):



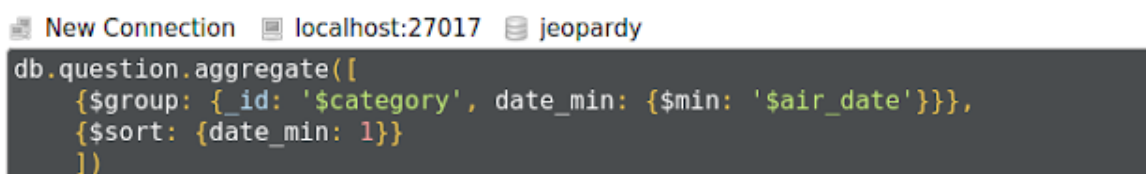
```
/* 1 */
{
  "_id" : ObjectId("5c1a78a87ca9bc4d55fffd89"),
  "category" : "HISTORY",
  "air_date" : "2004-12-31",
  "question" : "'Karl led the first of these Marxist organizational efforts; the second one began in 1889'",
  "value" : "$800",
  "answer" : "the International",
  "round" : "Jeopardy!",
  "show_number" : "4680"
}

/* 2 */
{
  "_id" : ObjectId("5c1a78a87ca9bc4d55ffff0e"),
  "category" : "HISTORY",
  "air_date" : "1996-12-06",
  "question" : "'On May 30, 1967 Colonel Ojukwu declared Biafra's independence from this country, starting a civil war'",
  "value" : "$800",
  "answer" : "Nigeria",
  "round" : "Double Jeopardy!",
  "show_number" : "2825"
}

/* 3 */
{
  "_id" : ObjectId("5c1a78a87ca9bc4d550012b4"),
  "category" : "HISTORY",
  "air_date" : "1993-06-29",
  "question" : "'The parents of this Peruvian president immigrated from Japan 4 years prior to his birth'",
  "value" : "$800",
  "answer" : "Fujimori",
  "round" : "Double Jeopardy!",
  "show_number" : "2047"
}

/* 4 */
```

- **Zapytanie z wykorzystaniem agregacji:** Zbiór kategorii z datą, kiedy po raz pierwszy dana kategoria się pojawiła, posortowany według daty rosnąco



New Connection localhost:27017 jeopardy

```
db.question.aggregate([
  {$group: {_id: '$category', date_min: {$min: '$air_date'}}},
  {$sort: {date_min: 1}}
])
```

Wyniki:

```
/* 1 */
{
  "_id" : "INVENTIONS",
  "date_min" : "1984-09-10"
}

/* 2 */
{
  "_id" : "4-LETTER WORDS",
  "date_min" : "1984-09-10"
}

/* 3 */
{
  "_id" : "HOLIDAYS",
  "date_min" : "1984-09-10"
}

/* 4 */
{
  "_id" : "LAKES & RIVERS",
  "date_min" : "1984-09-10"
}

/* 5 */
{
  "_id" : "NATIONAL LANDMARKS",
  "date_min" : "1984-09-10"
}

/* 6 */
{
  "_id" : "THE BIBLE",
  "date_min" : "1984-09-10"
}
```

- **Zapytanie wykorzystujące map reduce:** Zbiór składający się z dat oraz ilości pytań zadanych danego dnia

New Connection localhost:27017 jeopardy

```
db.question.mapReduce(  
  function() {emit(this.air_date, this.value);},  
  function(key, values){return values.length},  
  {out: 'questions_on_that_date'}  
)
```

Efekt:

New Connection localhost:27017 jeopardy

db.getCollection('questions\_on\_that\_date').find({})

questions\_on\_that\_date 0.001 sec.

```
/* 1 */  
{  
  "_id" : "1984-09-10",  
  "value" : 48.0  
}  
  
/* 2 */  
{  
  "_id" : "1984-09-11",  
  "value" : 44.0  
}  
  
/* 3 */  
{  
  "_id" : "1984-09-12",  
  "value" : 25.0  
}  
  
/* 4 */  
{  
  "_id" : "1984-09-13",  
  "value" : 53.0  
}  
  
/* 5 */  
{  
  "_id" : "1984-09-14",  
  "value" : 20.0  
}  
  
/* 6 */  
{  
  "_id" : "1984-09-20",  
  "value" : 50.0  
}  
  
/* 7 */  
{  
  "_id" : "1984-09-21",  
  "value" : 40.0  
}
```

## 2. Zapytania z poziomu interfejsu programistycznego:

- Zapytanie proste: Zbiór pytań z kategorii "historia":

```
16
17 @
18 public static void simple_query(DBCollection coll){
19     BasicDBObject query = new BasicDBObject("category","HISTORY");
20     DBCursor cursor = coll.find(query);
21     try{
22         while(cursor.hasNext()){
23             System.out.println(cursor.next());
24         }
25     }finally{
26         cursor.close();
27     }
28 }
29
30 public static void main(String[] args) throws UnknownHostException {
31     MongoLab mongoLab = new MongoLab();
32     DBCollection coll = mongoLab.db.getCollection( name: "question");
33     simple_query(coll);
34     mongoLab.mongoClient.close();
35 }
36
```

Rezultat:

```
"_id": {"_id": "5c1a78aa7c9b0c4d5592fc7f"}, "category": "HISTORY", "air_date": "1997-09-09", "question": "England's Richard III was the last king of this ruling house", "value": "$1800", "answer": "York", "round": "Double Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d5592fc7f"}, "category": "HISTORY", "air_date": "1997-09-09", "question": "Soldier & statesman Louis Botha helped negotiate the terms that ended this war in 1902", "value": "$1,000", "answer": "The Boer War", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d55930811"}, "category": "HISTORY", "air_date": "1993-07-02", "question": "This czarina gave her lover Grigori Potemkin the Tauride Palace in St. Petersburg", "value": "$200", "answer": "Catherine the Great", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d55930811"}, "category": "HISTORY", "air_date": "1993-07-02", "question": "This religious movement of the 1500s led to the birth of Protestantism", "value": "$600", "answer": "the Reformation", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d55930822"}, "category": "HISTORY", "air_date": "1993-07-02", "question": "The Webster-Ashburton Treaty of 1842 settled the boundary dispute between New Brunswick & this state", "value": "$2,000", "answer": "New Brunswick", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d55930825"}, "category": "HISTORY", "air_date": "1993-07-02", "question": "1 of the 7 ancient wonders, the statue of this Greek god was destroyed by fire c. 475 A.D. in Constantinople", "value": "$400", "answer": "the Colossus of Rhodes", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d5593082a"}, "category": "HISTORY", "air_date": "1993-07-02", "question": "Approved August 27, 1789, this French document proclaimed that 'men are born & remain free...'", "value": "$1800", "answer": "the Declaration of the Rights of Man and of the Citizen", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308aa"}, "category": "HISTORY", "air_date": "2001-02-13", "question": "The storming of this prison in 1789 is one of the most famous events of the French Revolution", "value": "$100", "answer": "the Bastille", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308bb"}, "category": "HISTORY", "air_date": "2001-02-13", "question": "This German earned the nickname 'The Desert Fox' while commanding the Afrika Korps in WWII", "value": "$200", "answer": "Erwin Rommel", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308bb"}, "category": "HISTORY", "air_date": "2001-02-13", "question": "Even though it's been 'found', this Peruvian ruin, seen here, is still called 'The Lost City of the Incas'", "value": "$300", "answer": "Mesa Verde", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308bd"}, "category": "HISTORY", "air_date": "2001-02-13", "question": "As queen of the Netherlands during WWII, she helped maintain Dutch neutrality", "value": "$400", "answer": "Wilhelmina", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308c4"}, "category": "HISTORY", "air_date": "2001-02-13", "question": "This 'Magnificent' sultan, seen here, was the 10th ruler of the Ottoman Empire", "value": "$500", "answer": "Suleiman", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308c5"}, "category": "HISTORY", "air_date": "1996-12-12", "question": "In 1992 this country's president Jose Lopez Portillo devalued the peso & nationalized the banks", "value": "$100", "answer": "Mexico", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f8"}, "category": "HISTORY", "air_date": "1996-12-12", "question": "On July 5, 1945 he announced that 'The entire Philippine Islands are now liberated'", "value": "$200", "answer": "Douglas MacArthur", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1996-12-12", "question": "Elizabeth Petrovna, the daughter of this czar, became empress of Russia in 1741", "value": "$400", "answer": "Peter the Great", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1996-12-12", "question": "In 1815 the Congress of Vienna guaranteed this country's neutrality", "value": "$300", "answer": "Switzerland", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1996-12-12", "question": "This country formerly known as Dutch Guiana gained independence in 1975", "value": "$500", "answer": "Suriname", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1988-11-16", "question": "He became King of Jordan after his mentally ill father was deposed in 1952", "value": "$200", "answer": "King Hussein II", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1988-11-16", "question": "The only first lady to ever had a Mississippi aristocrat named Varina", "value": "$400", "answer": "The Confederacy", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1988-11-16", "question": "This lawyer became the leader of the Indian National Congress in 1920", "value": "$600", "answer": "Mahatma Gandhi", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1988-11-16", "question": "Sir Humphrey Gilbert, half brother of the Irish National Congress in 1920", "value": "$400", "answer": "Fletcher Christian", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1988-11-16", "question": "An eighteenth-century war was named for this part of Robert Jenkins' body, reputedly cut off by Spaniards", "value": "$1800", "answer": "the Ear of Jenkins", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1997-06-20", "question": "On Oct. 28, 1492 he landed at Cuba, first calling it Juana in honor of the Spanish rulers' daughter", "value": "$200", "answer": "Christopher Columbus", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1997-06-20", "question": "Tenochtitlan, capital of this empire, was founded in 1325 on an island in what was Lake Texcoco", "value": "$400", "answer": "Aztec", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1997-06-20", "question": "In 1908 more than 50,000 were killed in an earthquake on this largest Mediterranean island", "value": "$800", "answer": "Sicily", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1997-06-20", "question": "It's said this law maker's code was 'written in blood' because most crimes were punishable by death", "value": "$1000", "answer": "The Code of Hammurabi", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1997-06-20", "question": "Between 1812 & 1815 the Scots & Irish founded the Red River settlement in this Canadian prairie province", "value": "$600", "answer": "Manitoba", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1992-10-28", "question": "The officer who led the mutiny on the Bounty", "value": "$400", "answer": "Fletcher Christian", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1992-10-28", "question": "Historic ones of these occurred on St. Bartholomew's Day in 1572 & St. Valentine's Day in 1929", "value": "$200", "answer": "massacres", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1992-10-28", "question": "During the Six-Day War, ground troops under this eye-patched Israeli minister of defense almost reached Damascus", "value": "$600", "answer": "Moshe Dayan", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1992-10-28", "question": "In 1836, two months after he took the Alamo, this general was routed by Sam Houston at San Jacinto", "value": "$800", "answer": "Santa Anna", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1992-10-28", "question": "Two years after William II became emperor, he sank the hopes of this 'Iron Chancellor' by firing him", "value": "$1000", "answer": "Otto von Bismarck", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1990-05-01", "question": "After James I granted Derry, Ireland to the citizens of London, it became known as this", "value": "$200", "answer": "Londonerry", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1990-05-01", "question": "Marino Faliero, who was the doge of this, led a plot to kill the nobles & was executed in 1355", "value": "$400", "answer": "Venice", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1990-05-01", "question": "This czar established a parliament called the Duma", "value": "$3,000", "answer": "Nicholas II", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "1990-05-01", "question": "The outbreak of this war in 431 B.C. put an end to Athens' Golden Age of Pericles", "value": "$800", "answer": "The Peloponnesian War", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "Atahualpa was the unlucky 13th emperor of these people", "value": "$1800", "answer": "Incas", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "These ancient people referred to themselves as Hellenes", "value": "$200", "answer": "Greeks", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "During the third of these military expeditions, the Palestinian ports of Acre & Jaffa were captured, but not Jerusalem", "value": "$400", "answer": "the Crusades", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "In 1840 regular transatlantic steamship service was inaugurated between Great Britain & this Nova Scotia capital", "value": "$600", "answer": "Halifax", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "In 1954 the French were defeated in the battle of this Vietnamese village; it was the decisive battle in the Indochina War", "value": "$400", "answer": "Dien Bien Phu", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
{"_id": "5c1a78aa7c9b0c4d559308f9"}, "category": "HISTORY", "air_date": "2000-06-08", "question": "This Holy Roman empress was also the queen of Hungary & Bohemia from 1740 to 1780", "value": "$1800", "answer": "Maria Theresa", "round": "Jeopardy!", "show": "Jeopardy!", "process": "finished with exit code 0"}
```

- Zapytanie z wykorzystaniem map reduce: Zbiór dat wraz z ilością pytań zadanych tego dnia:

```

public static void third_query(DBCollection coll){
    String map = "function(){ "+
        "emit(this.air_date, this.value);}";
    String reduce = "function(key, values){ "+
        "return values.length;}";
    MapReduceCommand cmd = new MapReduceCommand(coll, map, reduce, outputCollection: null, MapReduceCommand.OutputType.INLINE, query: null);
    MapReduceOutput out = coll.mapReduce(cmd);
    for(DBObject o : out.results()){
        System.out.println(o.toString());
    }
}

public static void main(String[] args) throws UnknownHostException {
    MongoLab mongoLab = new MongoLab();
    DBCollection coll = mongoLab.db.getCollection( name: "question");
    //simple_query(coll);
    //second_query(coll);
    third_query(coll);
    mongoLab.mongoClient.close();
}

```

Wynik:

```

MongoLab x
{ "_id" : "2011-11-25" , "value" : 61.0}
{ "_id" : "2011-11-28" , "value" : 61.0}
{ "_id" : "2011-11-29" , "value" : 61.0}
{ "_id" : "2011-11-30" , "value" : 60.0}
{ "_id" : "2011-12-01" , "value" : 60.0}
{ "_id" : "2011-12-02" , "value" : 59.0}
{ "_id" : "2011-12-05" , "value" : 59.0}
{ "_id" : "2011-12-06" , "value" : 61.0}
{ "_id" : "2011-12-07" , "value" : 59.0}
{ "_id" : "2011-12-08" , "value" : 60.0}
{ "_id" : "2011-12-09" , "value" : 61.0}
{ "_id" : "2011-12-12" , "value" : 61.0}
{ "_id" : "2011-12-13" , "value" : 59.0}
{ "_id" : "2011-12-14" , "value" : 57.0}
{ "_id" : "2011-12-15" , "value" : 61.0}
{ "_id" : "2011-12-16" , "value" : 59.0}
{ "_id" : "2011-12-19" , "value" : 61.0}
{ "_id" : "2011-12-20" , "value" : 61.0}
{ "_id" : "2011-12-21" , "value" : 60.0}
{ "_id" : "2011-12-22" , "value" : 59.0}
{ "_id" : "2011-12-23" , "value" : 55.0}
{ "_id" : "2011-12-26" , "value" : 57.0}
{ "_id" : "2011-12-27" , "value" : 56.0}
{ "_id" : "2011-12-28" , "value" : 60.0}
{ "_id" : "2011-12-29" , "value" : 58.0}
{ "_id" : "2011-12-30" , "value" : 57.0}
{ "_id" : "2012-01-02" , "value" : 61.0}
{ "_id" : "2012-01-03" , "value" : 61.0}
{ "_id" : "2012-01-04" , "value" : 58.0}
{ "_id" : "2012-01-05" , "value" : 61.0}
{ "_id" : "2012-01-06" , "value" : 61.0}
{ "_id" : "2012-01-09" , "value" : 54.0}
{ "_id" : "2012-01-10" , "value" : 55.0}
{ "_id" : "2012-01-11" , "value" : 61.0}
{ "_id" : "2012-01-12" , "value" : 58.0}
{ "_id" : "2012-01-13" , "value" : 60.0}
{ "_id" : "2012-01-16" , "value" : 55.0}
{ "_id" : "2012-01-17" , "value" : 58.0}
{ "_id" : "2012-01-18" , "value" : 61.0}
{ "_id" : "2012-01-19" , "value" : 60.0}
{ "_id" : "2012-01-20" , "value" : 58.0}
{ "_id" : "2012-01-23" , "value" : 61.0}
{ "_id" : "2012-01-24" , "value" : 59.0}
{ "_id" : "2012-01-25" , "value" : 61.0}
{ "_id" : "2012-01-27" , "value" : 30.0}

Process finished with exit code 0

```