

# Introduction to MongoDB

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# Databases

- Databases are used to store structured information
- Databases support various operations on the data
  - Query
  - Insert
  - Update
  - Delete

# NoSQL Databases

- SQL (structured query language) based relational databases have been very popular means of storing data
- NoSQL databases are increasingly becoming popular to address some challenges encountered with SQL databases

# NoSQL Databases

- Four broad categories:
  - Document databases (e.g., MongoDB)
  - Key-value databases (e.g., Redis)
  - Column-family databases (e.g., Cassandra)
  - Graph databases (e.g., Neo4J)

# Document Databases

- Document: A self-contained piece of information
  - E.g., a JSON document: {"name": "Uthapizza", "description": "A unique combination . . ."}
- Collection: collection of documents
- Database: A set of collections

# Why NoSQL

- Scalability
  - Availability
  - Consistency
  - Partition tolerance
- Ease of deployment
  - No object-relation mapping required

# MongoDB

- Document Database
  - Server can support multiple databases
  - A database consists of a set of collections
  - A collection is a set of documents
  - Document is effectively a JSON document with some additional features

# MongoDB Format

- Mongo stores the documents in BSON (Binary JSON) format
  - Supports length prefix on each value
    - Easy to skip over a field
  - Information about the type of a field value
  - Additional primitives types not supported by raw JSON like UTC date time, raw binary, and ObjectId



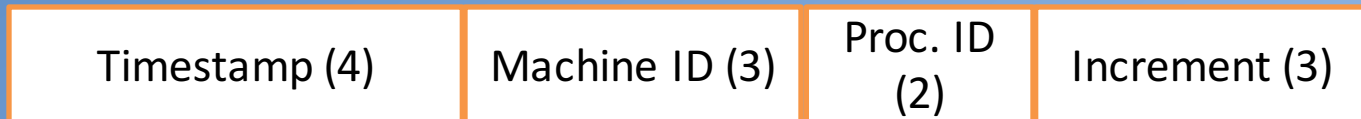
# MongoDB ObjectId

- Every document in Mongo must have an “\_id” field that is unique
- Default ObjectId created by Mongo when you insert a document
- Example:

```
{  
  "_id" : ObjectId("56ce74c0b02806eff4558f1f"),  
  "name" : "Uthapizza",  
  "description" : "Test"  
}
```

# MongoDB ObjectId

- ObjectId is a 12 byte field:



- `id.getTimestamp()` returns the timestamp in ISO Date format.

# Exercise: Introduction to MongoDB

- Downloading and Installing MongoDB
- Starting the server and interacting with it using the Mongo REPL shell