

NoSQL Databases

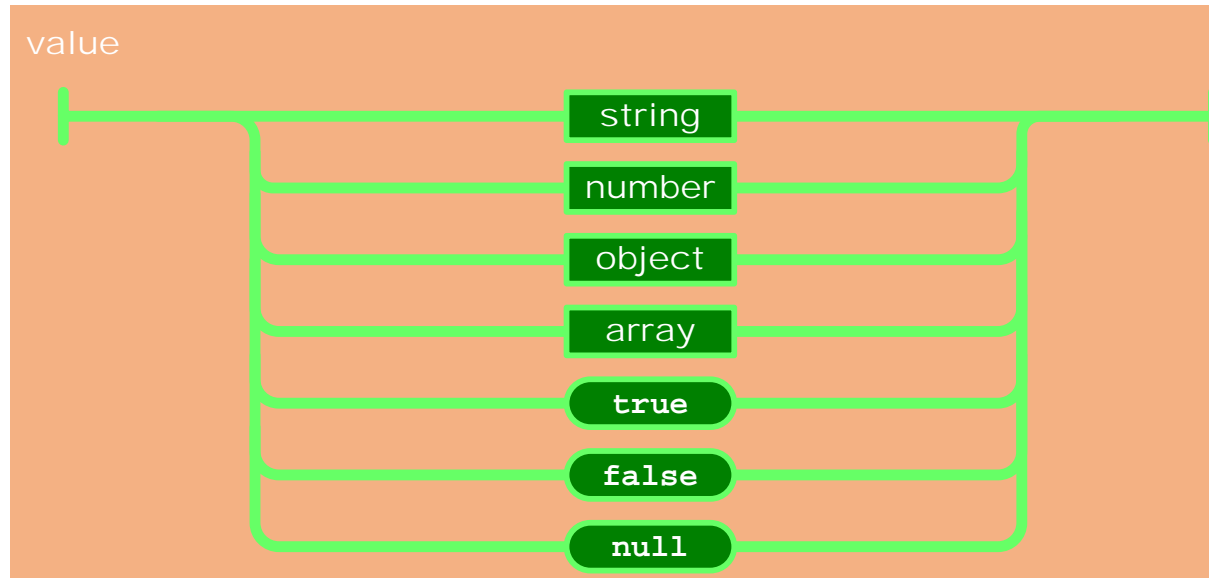
JSON

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Values

- Strings
- Numbers
- Booleans
- Objects
- Arrays
- **null**

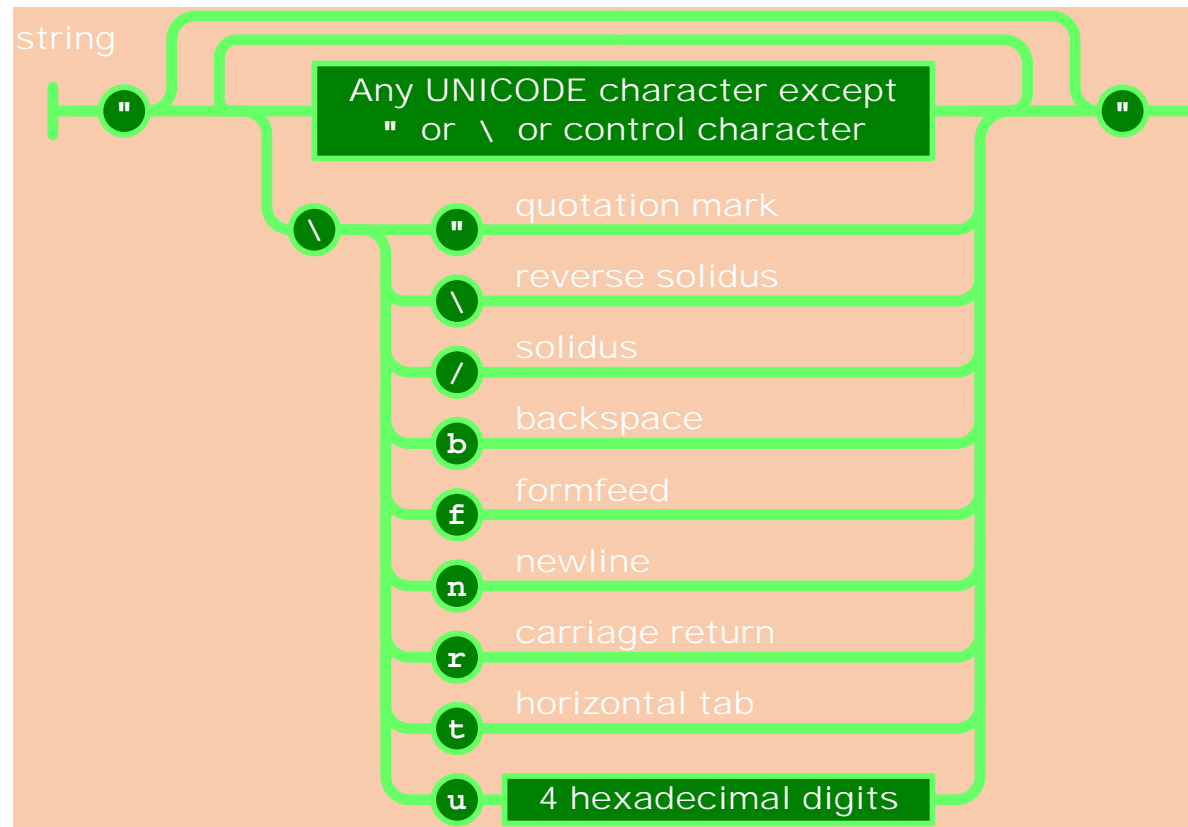
Value



Strings

- Sequence of 0 or more Unicode characters
- No separate character type
 - A character is represented as a string with a length of 1
- Wrapped in "double quotes"
- Backslash escapement

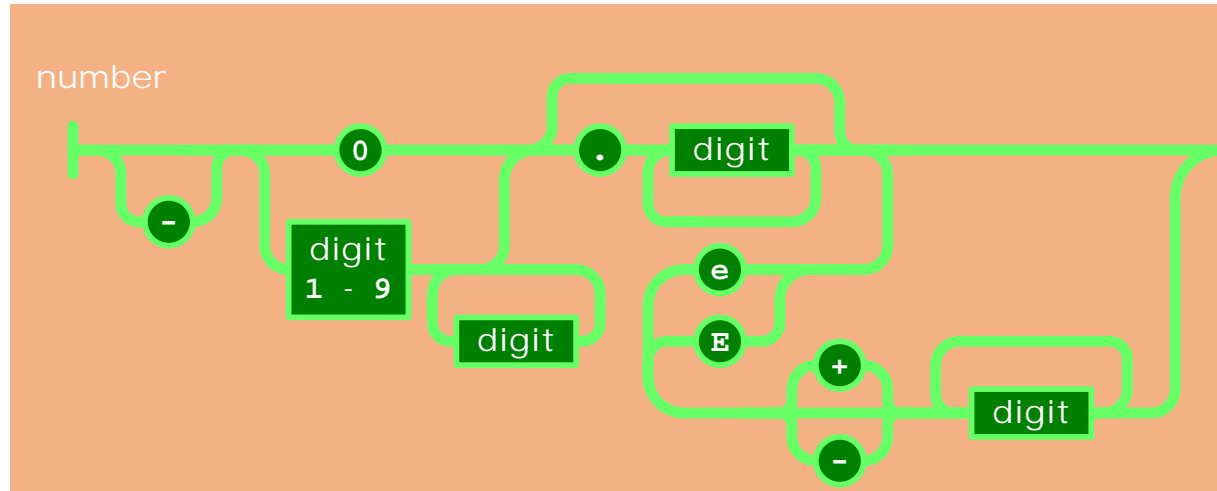
String



Numbers

- Integer
 - Real
 - Scientific
-
- No octal or hex
 - No **NaN** or **Infinity**
 - Use **null** instead

Number



Booleans

- **true**
- **false**

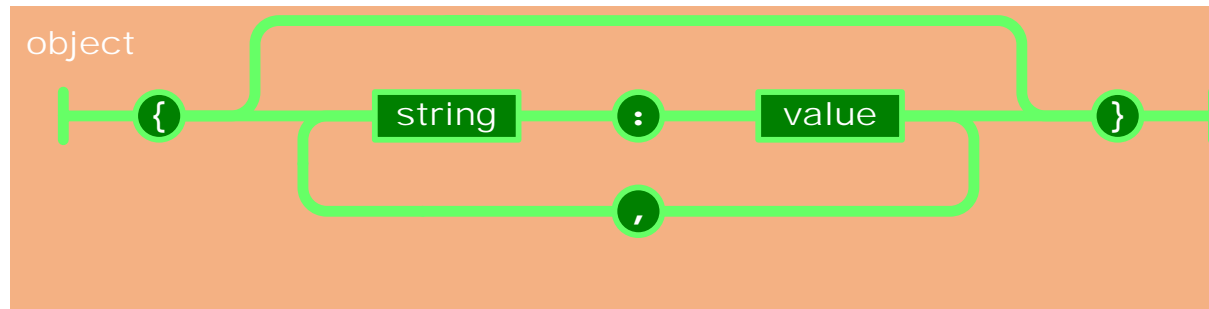
null

- A value that isn't anything

Object

- Objects are unordered containers of key/value pairs
- Objects are wrapped in { }
- , separates key/value pairs
- : separates keys and values
- Keys are strings
- Values are JSON values
 - struct, record, hashtable, object

Object



Object

```
{"name": "Jack B. Nimble", "at large":  
true, "grade": "A", "level": 3,  
"format": {"type": "rect", "width": 1920,  
"height": 1080, "interlace": false,  
"framerate": 24}}
```

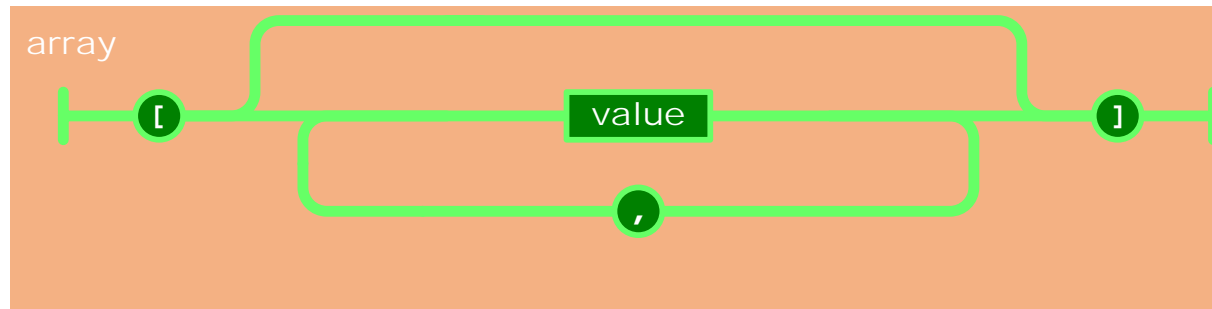
Object

```
{  
  "name":      "Jack B. Nimble",  
  "at large":  true,  
  "grade":     "A",  
  "format": {  
    "type":      "rect",  
    "width":     1920,  
    "height":    1080,  
    "interlace": false,  
    "framerate": 24  
  }  
}
```

Array

- Arrays are ordered sequences of values
- Arrays are wrapped in []
- , separates values
- JSON does not talk about indexing.
 - An implementation can start array indexing at 0 or 1.

Array



Array

```
[ "Sunday", "Monday", "Tuesday", "Wednesday",  
  "Thursday", "Friday", "Saturday" ]
```

```
[  
  [0, -1, 0],  
  [1, 0, 0],  
  [0, 0, 1]  
]
```


Arrays vs Objects

- Use objects when the key names are arbitrary strings.
- Use arrays when the key names are sequential integers.
- Don't get confused by the term Associative Array.

MongoDB Documents

- JSON

```
{  
    "FirstName": "Ismael"  
    "LastName": "Navas Delgado"  
}
```

- XML

```
<person>  
    <firstname>Ismael</firstname>  
    <lastname>  
        Navas Delgado  
    </lastname>  
</person>
```

MongoDB Documents

- JSON

```
{
```

```
  "FirstName": "Ismael"
```

```
  "LastName": "Navas Delgado"
```

```
}
```

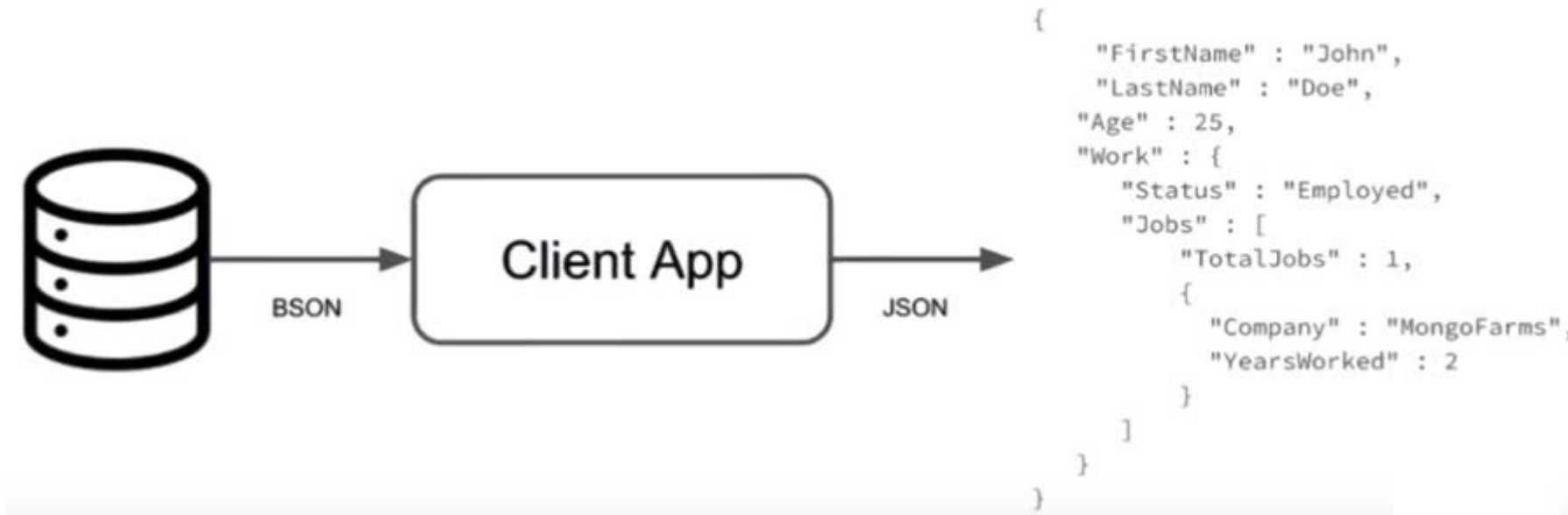
- Relational

FirstName (String)	LastName (String)
Ismael	Navas Delgado

MongoDB JSON Limitations

- MongoDB Documents (~tuples) are restricted to 16MB size.
- If you try to insert or update a document with bigger size you'll get an error.

MongoDB BSON (Binary JSON)



MongoDB BSON

BSON Data types

- Double
- String
- Object (Document)
- Array
- Binary Data
- Undefined
- ObjectId
- Boolean
- Date
- Null
- Regular Expression
- DBPointer
- JavaScript
- Symbol
- JavaScript (with scope)_
- 32-bit integer
- Timestamp
- 64-bit integer
- Decimal128
- MinKey
- MaxKey

JSON Data types

- Object <document>
- String
- Number
- Array
- Boolean
- Null