

In this lecture, we will discuss...

- ✧ Normalization
- ✧ 3rd Normal Form
- ✧ Single Collection
- ✧ Multiple Collection



Normalization – 3rd Normal Form (problem)

Movie ID	Title	Genre	Actor	Director
101	The Departed	Drama	Matt Damon	Martin Scorsese
102	The Godfather	Drama	Marlon Brando	Francis Ford Coppola
103	The Bourne Supremacy	Thriller	Matt Damon	Paul Greengrass



Normalization – 3rd Normal Form

Movie ID	Title	Genre	Actor ID	Director ID
101	The Departed	Drama	1	1
102	The GodFather	Drama	2	2
103	The Bourne Supremacy	Thriller	1	3

Actor ID	Name
1	Matt Damon
2	Marlon Brando

Director ID	Name
1	Martin Scorsese
2	Francis Ford Coppola
3	Paul Greengrass



De-normalized/Embedded approach

```
1 {
2   "title": "The Departed",
3   "type": "Movie",
4   "director": "Martin Scorsese",
5   "actors": [
6     {
7       "actorName": "Leonardo DiCaprio",
8       "character": "Billy",
9       "main": true,
10      "urlCharacter": "http://www.imdb.com/character/ch0251381",
11      "urlPhoto": "http://ia.media-imdb.com/images/M/MV5BMjI0MTg3MzI0M15BMl5BanBnXkFtZ
12      "urlProfile": "http://www.imdb.com/name/nm0000138"
13    },
14    {
15      "actorName": "Matt Damon",
16      "character": "Colin Sullivan",
17      "main": true,
18      "urlCharacter": "http://www.imdb.com/character/ch0002488",
19      "urlPhoto": "http://ia.media-imdb.com/images/M/MV5BMTM0NzYzNDgxM15BMl5BanBnXkFtZ
20      "urlProfile": "http://www.imdb.com/name/nm0000354"
21    }
22  ]
23 }
```

MongoDB – Multiple Collection

Movie

```
director : Martin Scorsese ,  
"actors": [  
  {  
    "actorId": "nm0000138",  
    "actorName": "Leonardo DiCaprio",  
    "character": "Billy",  
    "main": true,
```

Director

```
    "Hong Kong"  
  ],  
  "directors": [  
    {  
      "name": "Martin Scorsese",  
      "nameId": "nm0000217"  
    }  
  ],
```

Actor

```
[  
{  
  "bio": "Few actors in the world have had a career quite as diverse as Leonardo DiCaprio. He has gone from relatively humble beginnings, as a supporting actor in low budget horror movies, such as Critters (1986), to teenage heartthrob in the 1990s, as the hunky lead actor in movie after movie, from Romeo and Juliet (1996) and Titanic (1997), to then become a leading man in Hollywood blockbusters, often directed by internationally renowned directors such as Martin Scorsese and Christopher Nolan. Wilhelm DiCaprio was born November 11, 1974 in Los Angeles, California, as Leonardo Wilhelm DiCaprio (née Indenbirken) and former comic book artist Irmelin DiCaprio (née Indenbirken)."  
  "birthName": "Leonardo Wilhelm DiCaprio",  
  "dateOfBirth": "11 November 1974",  
  "height": "6' (1.83 m)",  
  "idIMDB": "nm0000138",  
  "name": "Leonardo DiCaprio",  
  "placeOfBirth": "Hollywood, Los Angeles, California, USA"  
},  
]
```



Summary

- ✧ Normalization
- ✧ Single and Multiple Collection

What's Next?

- ✧ Data Relationships

