US-TCS-604 – Big Data Analytics
Practical 3 – Operators in MongoDB

Create a MongoDB schema for blog website which will have the collection as post, comments and tags list. This website should follow these requirements:

- **Every post must have a unique id, title, description and url.**
- **Every post can have one or more tags.**
- **Every post can have one or more comments given by users, along with their names, message, date and likes.**
- **Every post has name of the publisher and total number of likes.**

Creating database blog.

> use blog
switched to db blog

Adding data to blog.

```
> db.blog.insertMany([{id: 1, title: "How to Get Away with Murder", desc: "you can't",
postby: "Krishi", url: "www.blogone.in/htgawm", likes: 100, comments: [{user: "ok",
message: "nice", date: "12-12-2022", likes: 10}], tags: [{user: "sabahat", message: "knives
out", likes: 4}]},
... {id: 2, title: "How to Bake a Brownie", desc: "you shouldn't", postby: "Vaibhav", url:
"www.blogone.in/htbab", likes: 101, comments: [{user: "disha", message: "very helpful",
date: "15-12-2022", likes: 1}], tags: [{user: "sagar", message: "eat", likes: 3}]},
... {id: 3, title: "Necessities of Suffering in Life", desc: "1) so you can appreciate good things
in life", postby: "Imaad", url: "www.blogone.in/nosil", likes: 200, comments: [{user: "krishi",
message: "noice", date: "05-12-2022", likes: 30}], tags: [{user: "vaibhav", message: "sad",
likes: 2}]},
... {id: 4, title: "The Perfect Outfit", desc: "goth", postby: "Sabahat", url:
"www.blogone.in/tpo", likes: 250, comments: [{user: "krishi", message: "great tip", date:
"14-12-2022", likes: 20}], tags: [{user: "krasia", message: "agreed", likes: 7}]},
... {id: 5, title: "Dancing 101", desc: "just do it", postby: "Disha", url:
"www.blogone.in/d101", likes: 150, comments: [{user: "ansh", message: "true", date: "20-11-
2022", likes: 30}], tags: [{user: "sabahat", message: "great", likes: 4}]}]
... )
{
        "acknowledged" : true,
        "insertedIds" : [
                ObjectId("639817bb8a1473e91a6fe8dc"),
                ObjectId("639817bb8a1473e91a6fe8dd"),
                ObjectId("639817bb8a1473e91a6fe8de"),
                ObjectId("639817bb8a1473e91a6fe8df"),
                ObjectId("639817bb8a1473e91a6fe8e0")
        ]
}
```

Displaying the content of blog.

```
> db.blog.find()
```

{ "_id" : ObjectId("639817bb8a1473e91a6fe8dc"), "id" : 1, "title" : "How to Get Away with Murder", "desc" : "you can't", "postby" : "Krishi", "url" : "www.blogone.in/htgawm", "likes" : 100, "comments" : [{ "user" : "ok", "message" : "nice", "date" : "12-12-2022", "likes" : 10 }], "tags" : [{ "user" : "sabahat", "message" : "knives out", "likes" : 4 }] }
{ "_id" : ObjectId("639817bb8a1473e91a6fe8dd"), "id" : 2, "title" : "How to Bake a Brownie", "desc" : "you shouldn't", "postby" : "Vaibhav", "url" : "www.blogone.in/htbab", "likes" : 101, "comments" : [{ "user" : "disha", "message" : "very helpful", "date" : "15-12-2022", "likes" : 1 }], "tags" : [{ "user" : "sagar", "message" : "eat", "likes" : 3 }] }
{ "_id" : ObjectId("639817bb8a1473e91a6fe8de"), "id" : 3, "title" : "Necessities of Suffering in Life", "desc" : "1) so you can appreciate good things in life", "postby" : "Imaad", "url" : "www.blogone.in/nosil", "likes" : 200, "comments" : [{ "user" : "krishi", "message" : "noice", "date" : "05-12-2022", "likes" : 30 }], "tags" : [{ "user" : "vaibhav", "message" : "sad", "likes" : 2 }] }
{ "_id" : ObjectId("639817bb8a1473e91a6fe8df"), "id" : 4, "title" : "The Perfect Outfit", "desc" : "goth", "postby" : "Sabahat", "url" : "www.blogone.in/tpo", "likes" : 250, "comments" : [{ "user" : "krishi", "message" : "great tip", "date" : "14-12-2022", "likes" : 20 }], "tags" : [{ "user" : "krasia", "message" : "agreed", "likes" : 7 }] }
{ "_id" : ObjectId("639817bb8a1473e91a6fe8e0"), "id" : 5, "title" : "Dancing 101", "desc" : "just do it", "postby" : "Disha", "url" : "www.blogone.in/d101", "likes" : 150, "comments" : [{ "user" : "ansh", "message" : "true", "date" : "20-11-2022", "likes" : 30 }], "tags" : [{ "user" : "sabahat", "message" : "great", "likes" : 4 }] }

Displaying formatted content of blog.

```
> db.blog.find().pretty()
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
	"id" : 1,
	"title" : "How to Get Away with Murder",
	"desc" : "you can't",
	"postby" : "Krishi",
	"url" : "www.blogone.in/htgawm",
	"likes" : 100,
	"comments" : [
		{
			"user" : "ok",
			"message" : "nice",
			"date" : "12-12-2022",
			"likes" : 10
		}
	],
	"tags" : [
		{
			"user" : "sabahat",
			"message" : "knives out",
			"likes" : 4
		}
	]
}
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8dd"),
```

```
        "id" : 2,
        "title" : "How to Bake a Brownie",
        "desc" : "you shouldn't",
        "postby" : "Vaibhav",
        "url" : "www.blogone.in/htbab",
        "likes" : 101,
        "comments" : [
                {
                        "user" : "disha",
                        "message" : "very helpful",
                        "date" : "15-12-2022",
                        "likes" : 1
                }
        ],
        "tags" : [
                {
                        "user" : "sagar",
                        "message" : "eat",
                        "likes" : 3
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8de"),
        "id" : 3,
        "title" : "Necessities of Suffering in Life",
        "desc" : "1) so you can appreciate good things in life",
        "postby" : "Imaad",
        "url" : "www.blogone.in/nosil",
        "likes" : 200,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "noice",
                        "date" : "05-12-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
                        "user" : "vaibhav",
                        "message" : "sad",
                        "likes" : 2
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8df"),
        "id" : 4,
        "title" : "The Perfect Outfit",
```

```
        "desc" : "goth",
        "postby" : "Sabahat",
        "url" : "www.blogone.in/tpo",
        "likes" : 250,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "great tip",
                        "date" : "14-12-2022",
                        "likes" : 20
                }
        ],
        "tags" : [
                {
                        "user" : "krasia",
                        "message" : "agreed",
                        "likes" : 7
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
        "id" : 5,
        "title" : "Dancing 101",
        "desc" : "just do it",
        "postby" : "Disha",
        "url" : "www.blogone.in/d101",
        "likes" : 150,
        "comments" : [
                {
                        "user" : "ansh",
                        "message" : "true",
                        "date" : "20-11-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "great",
                        "likes" : 4
                }
        ]
}
```


Displaying posts with likes greater than or equal to 200.

```
> db.blog.find({likes: {$gte:200}}).pretty()
{
```

```
        "_id" : ObjectId("639817bb8a1473e91a6fe8de"),
        "id" : 3,
        "title" : "Necessities of Suffering in Life",
        "desc" : "1) so you can appreciate good things in life",
        "postby" : "Imaad",
        "url" : "www.blogone.in/nosil",
        "likes" : 200,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "noice",
                        "date" : "05-12-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
                        "user" : "vaibhav",
                        "message" : "sad",
                        "likes" : 2
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8df"),
        "id" : 4,
        "title" : "The Perfect Outfit",
        "desc" : "goth",
        "postby" : "Sabahat",
        "url" : "www.blogone.in/tpo",
        "likes" : 250,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "great tip",
                        "date" : "14-12-2022",
                        "likes" : 20
                }
        ],
        "tags" : [
                {
                        "user" : "krasia",
                        "message" : "agreed",
                        "likes" : 7
                }
        ]
}
```


OR OPERATOR

Displaying posts either with likes = 150 or made by Sabahat.

```
> db.blog.find({$or:[{likes:150}, {postby:"Sabahat"}]}).pretty()
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8df"),
	"id" : 4,
	"title" : "The Perfect Outfit",
	"desc" : "goth",
	"postby" : "Sabahat",
	"url" : "www.blogone.in/tpo",
	"likes" : 250,
	"comments" : [
		{
			"user" : "krishi",
			"message" : "great tip",
			"date" : "14-12-2022",
			"likes" : 20
		}
	],
	"tags" : [
		{
			"user" : "krasia",
			"message" : "agreed",
			"likes" : 7
		}
	]
}
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
	"id" : 5,
	"title" : "Dancing 101",
	"desc" : "just do it",
	"postby" : "Disha",
	"url" : "www.blogone.in/d101",
	"likes" : 150,
	"comments" : [
		{
			"user" : "ansh",
			"message" : "true",
			"date" : "20-11-2022",
			"likes" : 30
		}
	],
	"tags" : [
		{
			"user" : "sabahat",
			"message" : "great",
			"likes" : 4
		}
	]
}
```

AND OPERATOR

Displaying post made by Disha and having likes less than 200.

```
> db.blog.find({$and:[{likes:{$lt:200}}, {postby:"Disha"}]}).pretty()
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
	"id" : 5,
	"title" : "Dancing 101",
	"desc" : "just do it",
	"postby" : "Disha",
	"url" : "www.blogone.in/d101",
	"likes" : 150,
	"comments" : [
		{
			"user" : "ansh",
			"message" : "true",
			"date" : "20-11-2022",
			"likes" : 30
		}
	],
	"tags" : [
		{
			"user" : "sabahat",
			"message" : "great",
			"likes" : 4
		}
	]
}
```

NOT OPERATOR

Displaying likes NOT less than 150.

```
> db.blog.find({likes:{$not:{$lt:150}}}).pretty()
{
	"_id" : ObjectId("639817bb8a1473e91a6fe8de"),
	"id" : 3,
	"title" : "Necessities of Suffering in Life",
	"desc" : "1) so you can appreciate good things in life",
	"postby" : "Imaad",
	"url" : "www.blogone.in/nosil",
	"likes" : 200,
	"comments" : [
		{
			"user" : "krishi",
			"message" : "noice",
			"date" : "05-12-2022",
			"likes" : 30
		}
	],
```

```
        "tags" : [
                {
                        "user" : "vaibhav",
                        "message" : "sad",
                        "likes" : 2
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8df"),
        "id" : 4,
        "title" : "The Perfect Outfit",
        "desc" : "goth",
        "postby" : "Sabahat",
        "url" : "www.blogone.in/tpo",
        "likes" : 250,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "great tip",
                        "date" : "14-12-2022",
                        "likes" : 20
                }
        ],
        "tags" : [
                {
                        "user" : "krasia",
                        "message" : "agreed",
                        "likes" : 7
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
        "id" : 5,
        "title" : "Dancing 101",
        "desc" : "just do it",
        "postby" : "Disha",
        "url" : "www.blogone.in/d101",
        "likes" : 150,
        "comments" : [
                {
                        "user" : "ansh",
                        "message" : "true",
                        "date" : "20-11-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
```

```
                "user" : "sabahat",
                "message" : "great",
                "likes" : 4
            }
        ]
}
```

NOR OPERATOR

Displaying all data except where likes is less than 100 or greater than 175.

```
> db.blog.find({$nor:[{likes:{$lt:100}}, {likes:{$gt:175}}]}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
        "id" : 1,
        "title" : "How to Get Away with Murder",
        "desc" : "you can't",
        "postby" : "Krishi",
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
                        "date" : "12-12-2022",
                        "likes" : 10
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "knives out",
                        "likes" : 4
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dd"),
        "id" : 2,
        "title" : "How to Bake a Brownie",
        "desc" : "you shouldn't",
        "postby" : "Vaibhav",
        "url" : "www.blogone.in/htbab",
        "likes" : 101,
        "comments" : [
                {
                        "user" : "disha",
                        "message" : "very helpful",
                        "date" : "15-12-2022",
                        "likes" : 1
                }
```

```
        ],
        "tags" : [
                {
                        "user" : "sagar",
                        "message" : "eat",
                        "likes" : 3
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
        "id" : 5,
        "title" : "Dancing 101",
        "desc" : "just do it",
        "postby" : "Disha",
        "url" : "www.blogone.in/d101",
        "likes" : 150,
        "comments" : [
                {
                        "user" : "ansh",
                        "message" : "true",
                        "date" : "20-11-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "great",
                        "likes" : 4
                }
        ]
}
```

IN OPERATOR

Display posts made by people listed in an array.

```
> db.blog.find({postby:{$in:["Krishi", "Disha"]}}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
        "id" : 1,
        "title" : "How to Get Away with Murder",
        "desc" : "you can't",
        "postby" : "Krishi",
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
```

```
                "date" : "12-12-2022",
                "likes" : 10
            }
        ],
        "tags" : [
            {
                "user" : "sabahat",
                "message" : "knives out",
                "likes" : 4
            }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8e0"),
        "id" : 5,
        "title" : "Dancing 101",
        "desc" : "just do it",
        "postby" : "Disha",
        "url" : "www.blogone.in/d101",
        "likes" : 150,
        "comments" : [
            {
                "user" : "ansh",
                "message" : "true",
                "date" : "20-11-2022",
                "likes" : 30
            }
        ],
        "tags" : [
            {
                "user" : "sabahat",
                "message" : "great",
                "likes" : 4
            }
        ]
}
```


Display all posts except those made by Krishi and Disha.

```
> db.blog.find({postby:{$not:{$in:["Krishi", "Disha"]}}}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dd"),
        "id" : 2,
        "title" : "How to Bake a Brownie",
        "desc" : "you shouldn't",
        "postby" : "Vaibhav",
        "url" : "www.blogone.in/htbab",
        "likes" : 101,
        "comments" : [
            {
                "user" : "disha",
```

```
                "message" : "very helpful",
                "date" : "15-12-2022",
                "likes" : 1
            }
        ],
        "tags" : [
            {
                "user" : "sagar",
                "message" : "eat",
                "likes" : 3
            }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8de"),
        "id" : 3,
        "title" : "Necessities of Suffering in Life",
        "desc" : "1) so you can appreciate good things in life",
        "postby" : "Imaad",
        "url" : "www.blogone.in/nosil",
        "likes" : 200,
        "comments" : [
            {
                "user" : "krishi",
                "message" : "noice",
                "date" : "05-12-2022",
                "likes" : 30
            }
        ],
        "tags" : [
            {
                "user" : "vaibhav",
                "message" : "sad",
                "likes" : 2
            }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8df"),
        "id" : 4,
        "title" : "The Perfect Outfit",
        "desc" : "goth",
        "postby" : "Sabahat",
        "url" : "www.blogone.in/tpo",
        "likes" : 250,
        "comments" : [
            {
                "user" : "krishi",
                "message" : "great tip",
                "date" : "14-12-2022",
```

```
                "likes" : 20
            }
        ],
        "tags" : [
            {
                "user" : "krasia",
                "message" : "agreed",
                "likes" : 7
            }
        ]
}
```


NIN OPERATOR

Short form for not in.

```
> db.blog.find({postby:{$nin:["Krishi", "Disha"]}}).pretty()
```


```
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dd"),
        "id" : 2,
        "title" : "How to Bake a Brownie",
        "desc" : "you shouldn't",
        "postby" : "Vaibhav",
        "url" : "www.blogone.in/htbab",
        "likes" : 101,
        "comments" : [
            {
                "user" : "disha",
                "message" : "very helpful",
                "date" : "15-12-2022",
                "likes" : 1
            }
        ],
        "tags" : [
            {
                "user" : "sagar",
                "message" : "eat",
                "likes" : 3
            }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8de"),
        "id" : 3,
        "title" : "Necessities of Suffering in Life",
        "desc" : "1) so you can appreciate good things in life",
        "postby" : "Imaad",
        "url" : "www.blogone.in/nosil",
        "likes" : 200,
        "comments" : [
            {
```

```
                "user" : "krishi",
                "message" : "noice",
                "date" : "05-12-2022",
                "likes" : 30
        }
    ],
    "tags" : [
        {
                "user" : "vaibhav",
                "message" : "sad",
                "likes" : 2
        }
    ]
}
{
    "_id" : ObjectId("639817bb8a1473e91a6fe8df"),
    "id" : 4,
    "title" : "The Perfect Outfit",
    "desc" : "goth",
    "postby" : "Sabahat",
    "url" : "www.blogone.in/tpo",
    "likes" : 250,
    "comments" : [
        {
                "user" : "krishi",
                "message" : "great tip",
                "date" : "14-12-2022",
                "likes" : 20
        }
    ],
    "tags" : [
        {
                "user" : "krasia",
                "message" : "agreed",
                "likes" : 7
        }
    ]
}
```


Regular Expressions

Starts With:


```
> db.blog.find({title:{$regex:/^H/}}).pretty()
{
    "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
    "id" : 1,
    "title" : "How to Get Away with Murder",
    "desc" : "you can't",
    "postby" : "Krishi",
```

```
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
                        "date" : "12-12-2022",
                        "likes" : 10
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "knives out",
                        "likes" : 4
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dd"),
        "id" : 2,
        "title" : "How to Bake a Brownie",
        "desc" : "you shouldn't",
        "postby" : "Vaibhav",
        "url" : "www.blogone.in/htbab",
        "likes" : 101,
        "comments" : [
                {
                        "user" : "disha",
                        "message" : "very helpful",
                        "date" : "15-12-2022",
                        "likes" : 1
                }
        ],
        "tags" : [
                {
                        "user" : "sagar",
                        "message" : "eat",
                        "likes" : 3
                }
        ]
}
```

ALL OPERATOR

```
> db.blog.find({postby:{$all:["Krishi", "Imaad"]}}).pretty()
> db.blog.find({postby:{$all:["Krishi"]}}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
        "id" : 1,
```

```
        "title" : "How to Get Away with Murder",
        "desc" : "you can't",
        "postby" : "Krishi",
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
                        "date" : "12-12-2022",
                        "likes" : 10
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "knives out",
                        "likes" : 4
                }
        ]
}

> db.blog.insertOne({postby:["Krishi", "Imaad", "Hanif"]})
{
        "acknowledged" : true,
        "insertedId" : ObjectId("6398296d8a1473e91a6fe8e1")
}
> db.blog.find({postby:{$all:["Krishi", "Imaad", "Hanif"]}}).pretty()
{
        "_id" : ObjectId("6398296d8a1473e91a6fe8e1"),
        "postby" : [
                "Krishi",
                "Imaad",
                "Hanif"
        ]
}
> db.blog.find({postby:{$all:["Krishi", "Imaad"]}}).pretty()
{
        "_id" : ObjectId("6398296d8a1473e91a6fe8e1"),
        "postby" : [
                "Krishi",
                "Imaad",
                "Hanif"
        ]
}

> db.blog.find({postby:{$all:["Krishi"]}}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
        "id" : 1,
```

```
        "title" : "How to Get Away with Murder",
        "desc" : "you can't",
        "postby" : "Krishi",
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
                        "date" : "12-12-2022",
                        "likes" : 10
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "knives out",
                        "likes" : 4
                }
        ]
}
{
        "_id" : ObjectId("6398296d8a1473e91a6fe8e1"),
        "postby" : [
                "Krishi",
                "Imaad",
                "Hanif"
        ]
}

> db.blog.find({postby:{$all:["Krishi", "Imaad"]}}).pretty()
{
        "_id" : ObjectId("6398296d8a1473e91a6fe8e1"),
        "postby" : [
                "Krishi",
                "Imaad",
                "Hanif"
        ]
}

> db.blog.find({postby:["Krishi", "Imaad"]}).pretty()
> db.blog.find({postby:{$in:["Krishi", "Imaad"]}}).pretty()
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8dc"),
        "id" : 1,
        "title" : "How to Get Away with Murder",
        "desc" : "you can't",
        "postby" : "Krishi",
        "url" : "www.blogone.in/htgawm",
        "likes" : 100,
```

```
        "comments" : [
                {
                        "user" : "ok",
                        "message" : "nice",
                        "date" : "12-12-2022",
                        "likes" : 10
                }
        ],
        "tags" : [
                {
                        "user" : "sabahat",
                        "message" : "knives out",
                        "likes" : 4
                }
        ]
}
{
        "_id" : ObjectId("639817bb8a1473e91a6fe8de"),
        "id" : 3,
        "title" : "Necessities of Suffering in Life",
        "desc" : "1) so you can appreciate good things in life",
        "postby" : "Imaad",
        "url" : "www.blogone.in/nosil",
        "likes" : 200,
        "comments" : [
                {
                        "user" : "krishi",
                        "message" : "noice",
                        "date" : "05-12-2022",
                        "likes" : 30
                }
        ],
        "tags" : [
                {
                        "user" : "vaibhav",
                        "message" : "sad",
                        "likes" : 2
                }
        ]
}
{
        "_id" : ObjectId("6398296d8a1473e91a6fe8e1"),
        "postby" : [
                "Krishi",
                "Imaad",
                "Hanif"
        ]
}
```

PRACTICAL 9

Cassandra

STEPS:

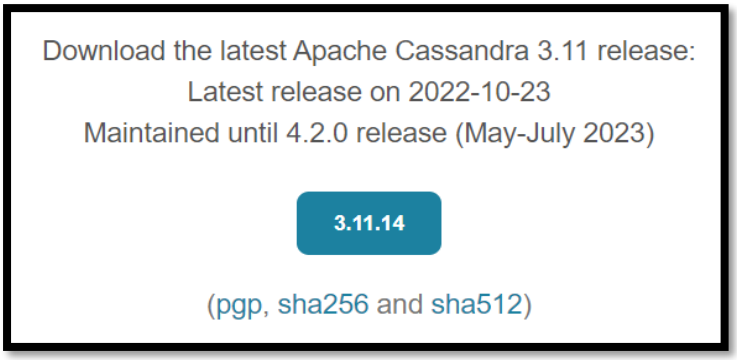
Perquisites:

1. Python 2.7
2. Java jdk 1.8

```
PS C:\Users\Mallika Sharma> java -version
java version "1.8.0_202"
Java(TM) SE Runtime Environment (build 1.8.0_202-b08)
Java HotSpot(TM) 64-Bit Server VM (build 25.202-b08, mixed mode)
PS C:\Users\Mallika Sharma> python --version
Python 2.7.18
PS C:\Users\Mallika Sharma>
```

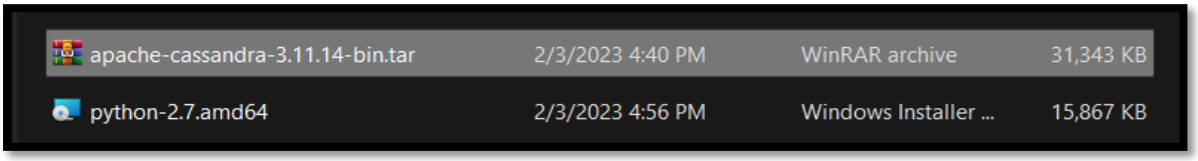
Add directory path in user variables.

1. C:\Program Files\Java\jdk1.8.0_121\bin

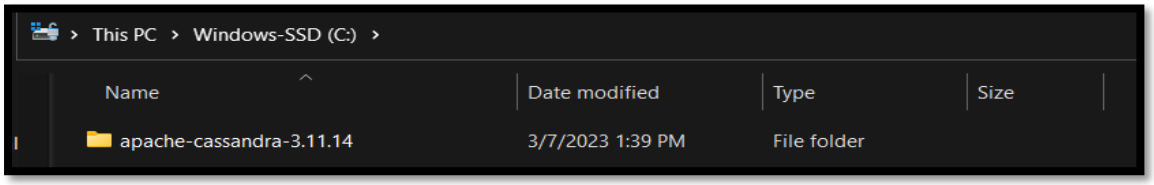


2. C:\Python27

https://cassandra.apache.org/_/download.html



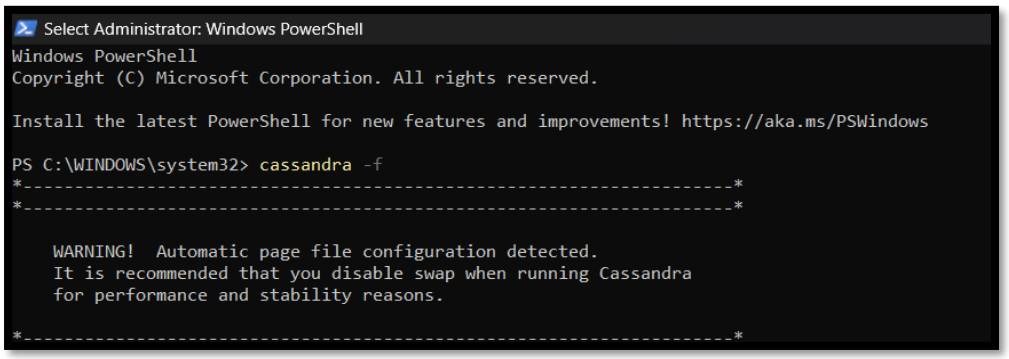
Compress the tar file. Unzip it into the C drive



C:\apache-cassandra-3.11.14\bin

Add the above path to user variables as well.

Type: Cassandra -f in command prompt



Now keep the current prompt on, while opening a new command prompt.

Type: cqlsh

Microsoft Windows [Version 10.0.22621.1265]

(c) Microsoft Corporation. All rights reserved.

C:\Users\disha>cqlsh

WARNING: console codepage must be set to cp65001 to support utf-8 encoding on Windows platforms.

If you experience encoding problems, change your console codepage with 'chcp 65001' before starting cqlsh.

Connected to Test Cluster at 127.0.0.1:9042.

[cqlsh 5.0.1 | Cassandra 3.11.14 | CQL spec 3.4.4 | Native protocol v4]

Use HELP for help.

WARNING: pyreadline dependency missing. Install to enable tab completion.

cqlsh>

1. Keyspace Operations:

Create Keyspace:

cqlsh> CREATE KEYSPACE tutorialspoint WITH replication = {'class':'SimpleStrategy', 'replication_factor' : 1};

cqlsh> CREATE KEYSPACE dishaWITH replication = {'class':'SimpleStrategy', 'replication_factor' : 1};

Verification:

cqlsh> DESCRIBE KEYSPACES;

tutorialspoint system_auth system_distributed disha

system_schema system system_traces

Durable_writes:

By default, the durable_writes properties of a table is set to true, however it can be set to false.

cqlsh> CREATE KEYSPACE deep WITH replication = {'class':'SimpleStrategy', 'replication_factor' : 1} AND DURABLE_WRITES = false;

Verification:

cqlsh> select * from system_schema.keyspaces;

keyspace_name | durable_writes | replication

---

system_auth | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

system_schema | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}

deep | False | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

disha| True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

tutorialspoint | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

system_distributed | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '3'}

system | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}

system_traces | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '2'}

(8 rows)

Using a Keyspace:

cqlsh> USE disha;

cqlsh:disha>

Altering a KeySpace:

cqlsh:disha> ALTER KEYSPACE dishaWITH replication = {'class':'NetworkTopologyStrategy'};

cqlsh:disha> ALTER KEYSPACE deep WITH replication = {'class':'NetworkTopologyStrategy'} AND DURABLE_WRITES = true;

Verification:

cqlsh> SELECT * FROM system_schema.keyspaces;

keyspace_name | durable_writes | replication

---

system_auth | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

system_schema | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}

deep | True | {'class': 'org.apache.cassandra.locator.NetworkTopologyStrategy'}

disha| True | {'class': 'org.apache.cassandra.locator.NetworkTopologyStrategy'}

tutorialspoint | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}

system_distributed | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '3'}

system | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}

system_traces | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '2'}

(8 rows)

Dropping a Keyspace:

cqlsh> DESCRIBE keyspaces;

tutorialspoint system_auth deep system_traces

system_schema system system_distributed disha

Verification:

cqlsh> DROP keyspace deep;

cqlsh> DESCRIBE keyspaces;

tutorialspoint system_auth system_distributed disha

system_schema system system_traces

2. Table Operations:

Creating a Table:

cqlsh> DESCRIBE keyspaces

tutorialspoint system_auth system_distributed disha

system_schema system system_traces

cqlsh> use disha;

cqlsh:disha> CREATE TABLE report(

... sub_id int PRIMARY KEY,

... sub_name text,

... marks varint,

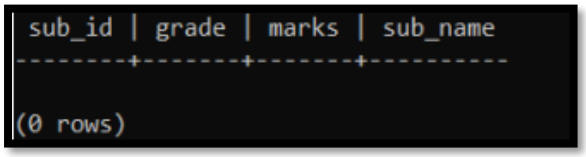
... grade text

...);

cqlsh:disha>

Verification:

cqlsh:disha> select * from report;



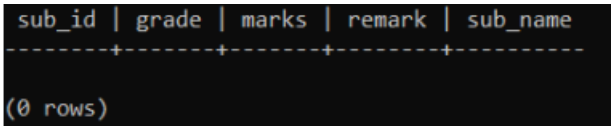
Altering a Table:

cqlsh:disha> ALTER TABLE report

... ADD remark text;

Verification:

cqlsh:disha> select * from report;



Dropping a Column:

cqlsh:disha> ALTER TABLE report

... DROP remark;

3. CRUD Operations:

Creating Data in Table:

cqlsh:disha> INSERT INTO report (sub_id, grade, marks, sub_name) VALUES (36, 'O', 98, 'Big Data Analysis');

cqlsh:disha> INSERT INTO report (sub_id, grade, marks, sub_name) VALUES (55, 'O', 96, 'Cyber Security and Forensics');

cqlsh:disha> INSERT INTO report (sub_id, grade, marks, sub_name) VALUES (602, 'A', 88, 'Machine Learning');

cqlsh:disha> INSERT INTO report (sub_id, grade, marks, sub_name) VALUES (636, 'B', 82, 'Cloud Computing');

cqlsh:disha> INSERT INTO report (sub_id, grade, marks, sub_name) VALUES (101, 'A', 96, 'Wireless Sensor Networks');

Verification:

cqlsh:disha> select * from report;

```
 sub_id | grade | marks | sub_name
--------+-------+-------+----------------------------
     55 |     O |    96 | Cyber Securit and Forensics
    602 |     A |    88 |            Machine Learning
    636 |     B |    82 |             Cloud Computing
     36 |     O |    98 |           Big Data Analysis
    101 |     A |    89 |    Wireless Sensor Networks

(5 rows)
```

Updating Data in a Table:

cqlsh:disha> UPDATE report SET grade = 'C', marks=78 WHERE sub_id=636;

Verification:

cqlsh:disha> select * from report;

```
 sub_id | grade | marks | sub_name
--------+-------+-------+----------------------------
     55 |     O |    96 | Cyber Securit and Forensics
    602 |     A |    88 |            Machine Learning
    636 |     C |    78 |             Cloud Computing
     36 |     O |    98 |          Big Data Analysis
    101 |     A |    89 |    Wireless Sensor Networks

(5 rows)
```

Reading Required Columns:

cqlsh:disha> SELECT sub_id, sub_name from report;

```
 sub_id | sub_name
--------+----------------------------
     55 | Cyber Securit and Forensics
    602 |            Machine Learning
    636 |             Cloud Computing
     36 |          Big Data Analysis
    101 |    Wireless Sensor Networks

(5 rows)
```

Or

cqlsh:disha> SELECT * from report WHERE grade = 'A' ALLOW FILTERING;

```
 sub_id | grade | marks | sub_name
--------+-------+-------+-------------------------
    602 |     A |    88 |         Machine Learning
    101 |     A |    89 | Wireless Sensor Networks

(2 rows)
```

Or

SELECT sub_id, sub_name from report WHERE grade = 'A' ALLOW FILTERING;

```
 sub_id | sub_name
--------+-------------------------
    602 |         Machine Learning
    101 | Wireless Sensor Networks

(2 rows)
```

Deleting Datafrom a Table:

cqlsh:disha> DELETE marks from report WHERE sub_id=636;

Verification:

cqlsh:disha> select * from report;

```
 sub_id | grade | marks | sub_name
--------+-------+-------+----------------------------
     55 |     O |    96 | Cyber Securit and Forensics
    602 |     A |    88 |            Machine Learning
    636 |     C |  null |             Cloud Computing
     36 |     O |    98 |           Big Data Analysis
    101 |     A |    89 |    Wireless Sensor Networks

(5 rows)
```

Deleting an Entire Row:

cqlsh:disha> DELETE from report WHERE sub_id=636;

Verification

cqlsh:disha> select * from report;

```
 sub_id | grade | marks | sub_name
--------+-------+-------+----------------------------
     55 |     O |    96 | Cyber Securit and Forensics
    602 |     A |    88 |            Machine Learning
     36 |     O |    98 |           Big Data Analysis
    101 |     A |    89 |    Wireless Sensor Networks

(4 rows)
```

****

PRACTICAL 10

Hadoop Installation and Word Count in Java and Python

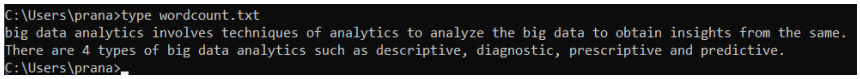
(Java in Local and HDFS MODE, Python in Local Mode)

Note: All files to be created wherever the command prompt opens, or open the command prompt where the files are stored.

Note: Start the PowerShell in administrator mode if any issues arise in yarn or namenode since elevated privileges are required in some scenarios.

Steps:

1. **Create a file which will be used for the word count:**



2. **Create the mapper.py file**

```
C:\Users\disha>type mapper.py
#!/usr/bin/env python
# import sys because we need to read and write data to STDIN and STDOUT
import sys

# reading entire line from STDIN (standard input)
for line in sys.stdin:
    # to remove leading and trailing whitespace
    line = line.strip()
    # split the line into words
    words = line.split()

    # we are looping over the words array and printing the word
    # with the count of 1 to the STDOUT


   for word in words:
        # write the results to STDOUT (standard output);
        # what we output here will be the input for the
        # Reduce step, i.e. the input for reducer.py
        print('%s\t%s' % (word, 1))
C:\Users\disha>
```

3. **Execute the mapper.py and check the output**

C:\Users\disha>type wordcount.txt | python mapper.py

big 1

data 1

analytics 1

involves 1

techniques 1

of 1

analytics 1

to 1

analyze 1

the 1

big 1

data 1

to 1

obtain 1

insights 1

from 1

the 1

same. 1

There 1

are 1

4 1

types 1

of 1

big 1

data 1

analytics 1

such 1

as 1

descriptive, 1

diagnostic, 1

prescriptive 1

and 1

predictive. 1

4. Create the reducer.py and check the output

```
#!/usr/bin/env python

from operator import itemgetter
import sys

current_word = None
current_count = 0
word = None

# read the entire line from STDIN
for line in sys.stdin:
    # remove leading and trailing whitespace
```

```
 line = line.strip()
    # splitting the data on the basis of tab we have provided in mapper.py
    word, count = line.split('\t', 1)
    # convert count (currently a string) to int
    try:
```

```
        count = int(count)
    except ValueError:
        # count was not a number, so silently
        # ignore/discard this line
        continue

    # this IF-switch only works because Hadoop sorts map output
    # by key (here: word) before it is passed to the reducer
    if current_word == word:
        current_count += count
    else:
        if current_word:
            # write result to STDOUT
            print '%s\t%s' % (current_word, current_count)
        current_count = count
        current_word = word

# do not forget to output the last word if needed!
if current_word == word:
    print '%s\t%s' % (current_word, current_count)
```

5. **Check execution of mapper and then reducer to confirm whether everything is working or not**

PS C:\Users\disha> type wordcount.txt | python mapper.py | sort | python reducer.py

```
4       1
analytics       3
analyze 1
and     1
```

are 1

as 1

big 3

data 3

descriptive, 1

diagnostic, 1

from 1

insights 1

involves 1

obtain 1

of 2

predictive. 1

prescriptive 1

same. 1

such 1

techniques 1

the 2

There 1

to 2

types 1

6. Create a directory hdfs and then copy the wordcount in that folder

C:\Users\disha>hdfs dfs -mkdir /wordcount

'C:\Program' is not recognized as an internal or external command,

operable program or batch file.

C:\Users\disha>hdfs dfs -copyFromLocal wordcount.txt /wordcount

'C:\Program' is not recognized as an internal or external command,

operable program or batch file.

7. **Check the contents of the hdfs**
8.

C:\Users\disha>hdfs dfs -ls /

'C:\Program' is not recognized as an internal or external command,

operable program or batch file.

Found 4 items

drwxr-xr-x - disha supergroup 0 2023-03-10 10:04 /Pig_Data

drwx-wx-wx - disha supergroup 0 2023-03-09 16:09 /tmp

drwxr-xr-x - disha supergroup 0 2023-04-07 15:10 /wordcount

drwxr-xr-x - disha supergroup 0 2023-04-07 15:05 /wordcount.txt

C:\Users\disha>hdfs dfs -ls /wordcount

'C:\Program' is not recognized as an internal or external command,

operable program or batch file.

Found 1 items

-rw-r--r-- 1 disha supergroup 212 2023-04-07 15:10 /wordcount/wordcount.txt

9. **Download the hadoop streaming jar from: https://jar-download.com/artifacts/org.apache.hadoop/hadoop-streaming/2.7.3/source-code. Also place the jar in a folder where the mapper and reducer are placed**

Execute the following command:

PS C:\Users\disha> hadoop jar hadoop-streaming-2.7.3.jar -input /wordcount/wordcount.txt -output /wordcount/output -mapper /mapper.py -reducer /reducer.py

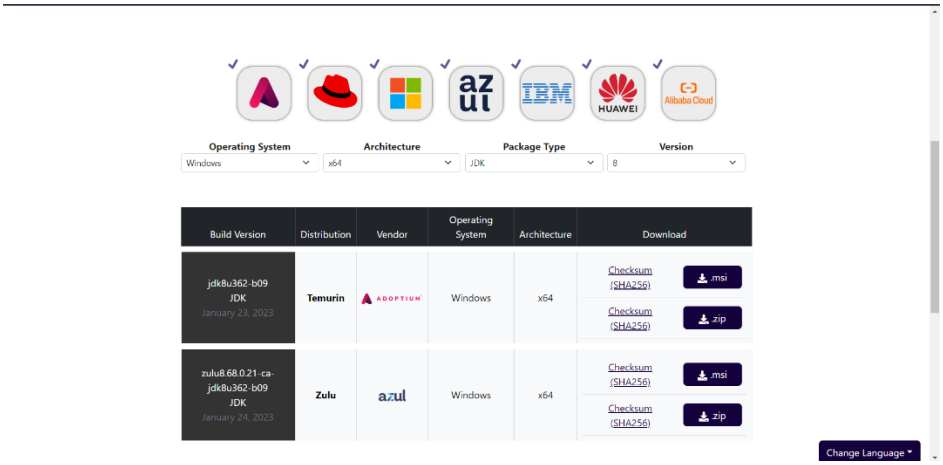
10. **Check the output by the following command**

hdfs dfs -cat /wordcount/output/part-00000

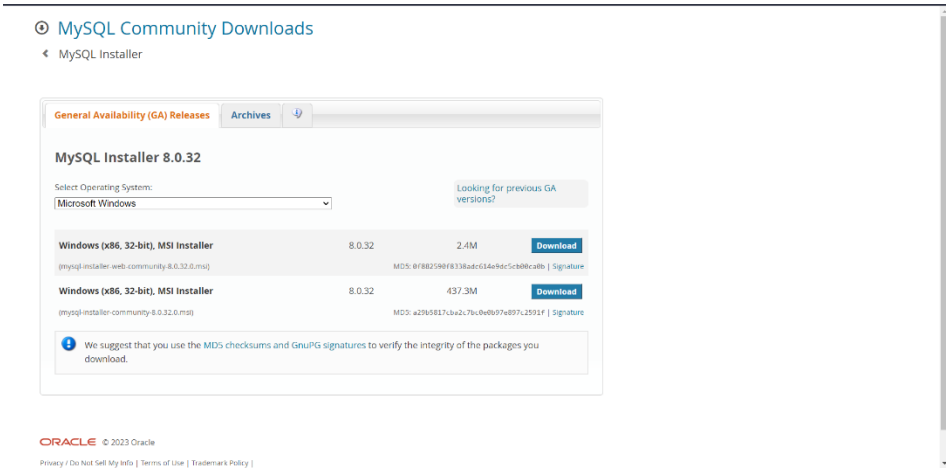
PRACTICAL 11

Hive Installation and Queries

1. Download and install Java Development Kit (JDK) version 8.
   https://adoptium.net/marketplace/?version=8



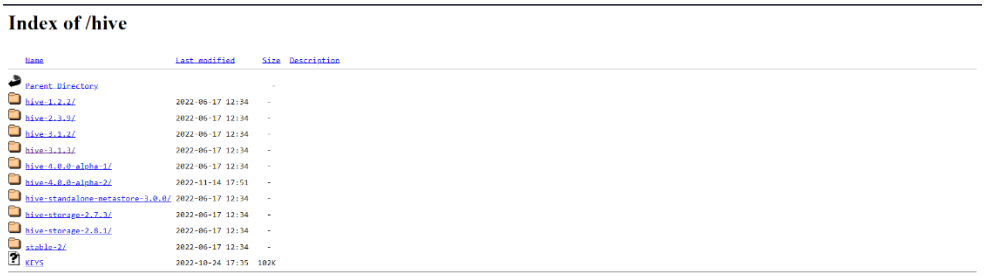
2. Download and install MySQL database server and MySQL Workbench.
   https://dev.mysql.com/downloads/installer/

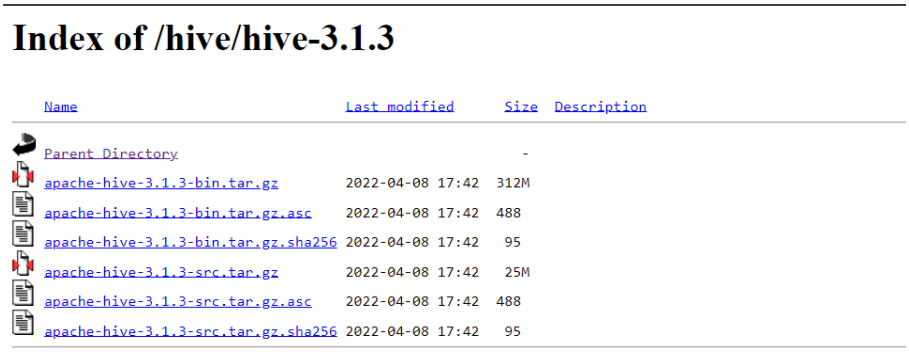


3. The latest stable version of Apache Hive from the official website.
https://dlcdn.apache.org/hive/

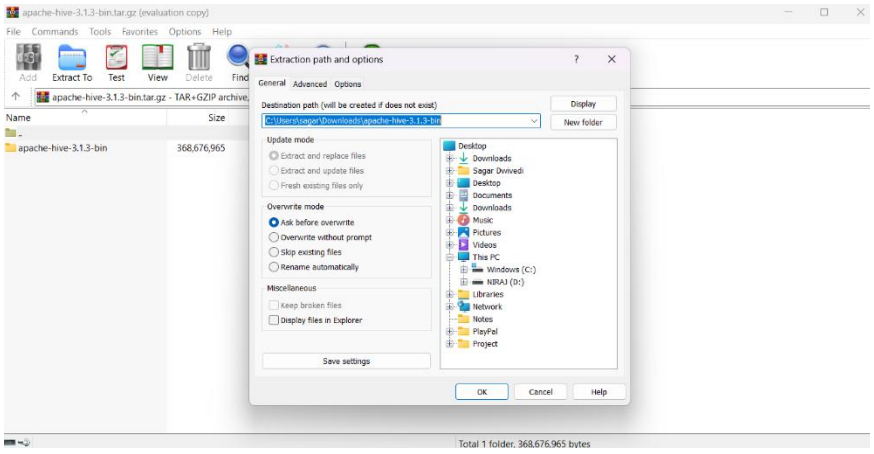
You can install version 3.x and later.

Install bin.tar.gz





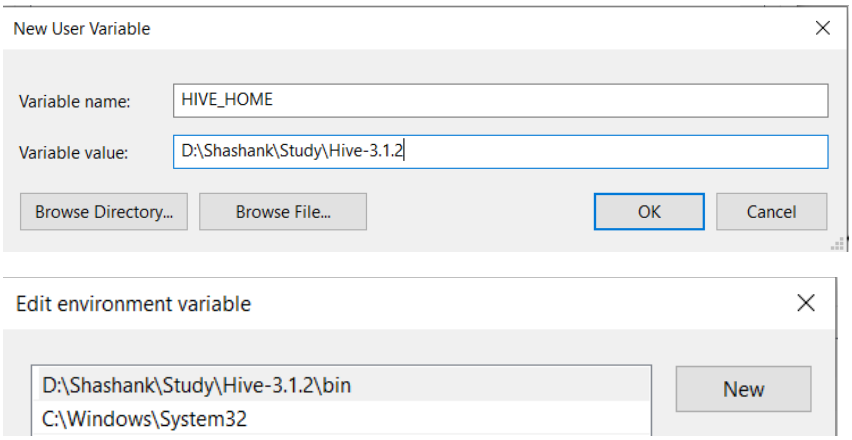
4. Extract the downloaded file to a directory of your choice.



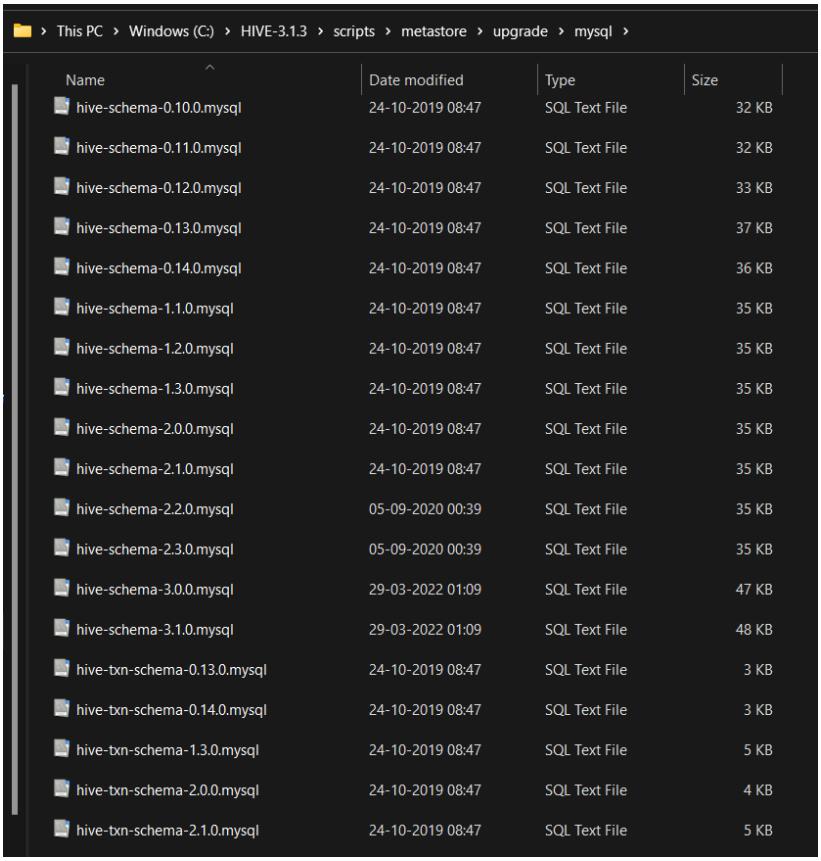
5. Install bin folder from https://github.com/HadiFadl/Hive-cmd and replace the bin in the hive folder.

6. Set the HADOOP_HOME and HIVE_HOME environment variables to the path where you extracted the downloaded files.

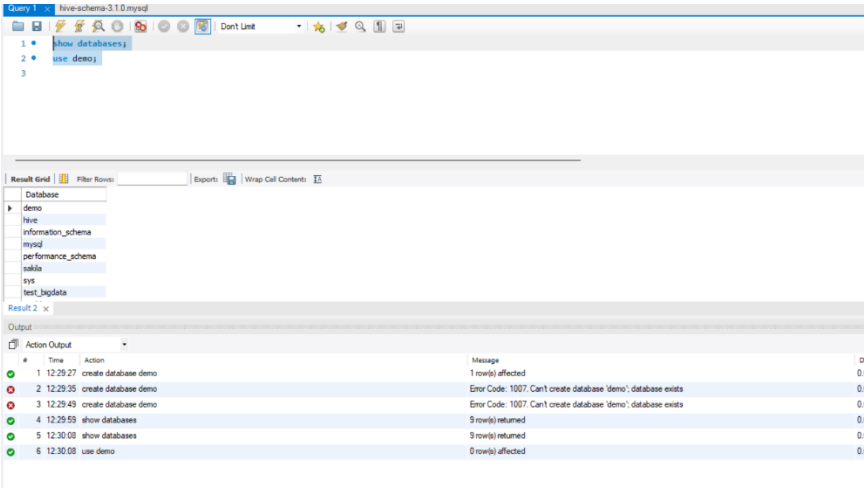
    a. Add %HADOOP_HOME%\bin and %HIVE_HOME%\bin to the PATH environment variable.



7. Open MySQL Workbench and create a new schema for Hive metastore database. Note down the schema name, username, and password.



a. Open the hive-schema-3.1.0 in the workbench



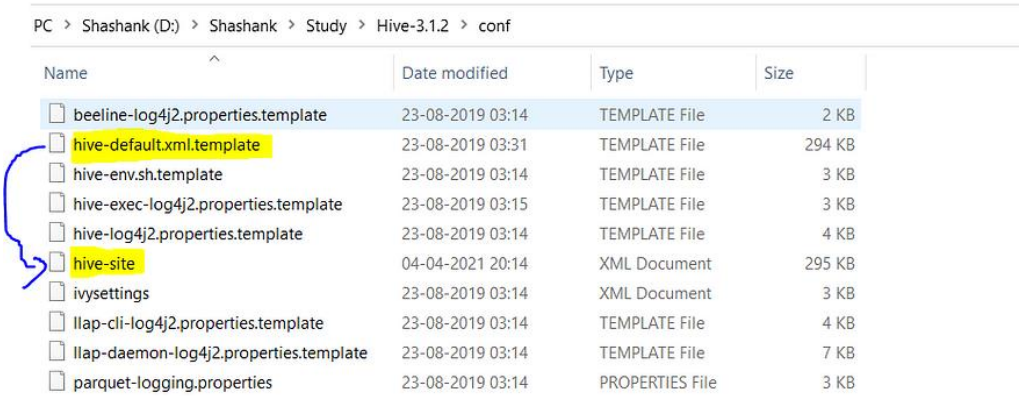
Create database and initiate it first before running the hive-schema script.

8. In the hive-site.xml file located in hive folder, update the following properties:
Creating File Hive-site.xml

Now we need to create the Hive-site.xml file in hive for configuring it :-

(We can find these files in Hive -> conf -> hive-default.xml.template)

We need to copy the hive-default.xml.template file and paste it in the same location and rename it to hive-site.xml. This will act as our main Config file for Hive.



9. Editing the hive-site.xml

- Reove &#8 from the hive-site

- <property>
  <name>hive.querylog.location</name>
  <value>$HIVE_HOME/iotmp</value>

- <description>Location of Hive run time structured log file</description>
  </property><property>
  <name>hive.exec.local.scratchdir</name>
  <value>$HIVE_HOME/iotmp</value>
  <description>Local scratch space for Hive jobs</description>
  </property><property>
  <name>hive.downloaded.resources.dir</name>
  <value>$HIVE_HOME/iotmp</value>
  <description>Temporary local directory for added resources in the remote file system.</description>
  </property>

- <property>
  <name>hive.metastore.uris</name>
  <value>thrift://<Your IP Address>:9083</value>
  </property>
  <property>
  <name>javax.jdo.option.ConnectionUserName</name>

<value>hive</value>
<description>Username to use against metastore database</description>
</property>

<property>
<name>javax.jdo.option.ConnectionURL</name>
<value>jdbc:mysql://localhost:3306/<Your
Database>?createDatabaseIfNotExist=true</value>
<description>
JDBC connect string for a JDBC metastore.
To use SSL to encrypt/authenticate the connection, provide database-specific SSL flag in the connection URL.
For example, jdbc:postgresql://myhost/db?ssl=true for postgres database.
</description>
</property>

<property>
<name>hive.metastore.warehouse.dir</name>
<value>hdfs://localhost:9000/user/hive/warehouse</value>
<description>location of default database for the warehouse</description>
</property>

<property>
<name>javax.jdo.option.ConnectionPassword</name>
<value><Hive Password></value>
<description>password to use against metastore database</description>
</property>

<property>
<name>datanucleus.schema.autoCreateSchema</name>
<value>true</value>
</property>
<property>
<name>datanucleus.schema.autoCreateTables</name>
<value>True</value>
</property>

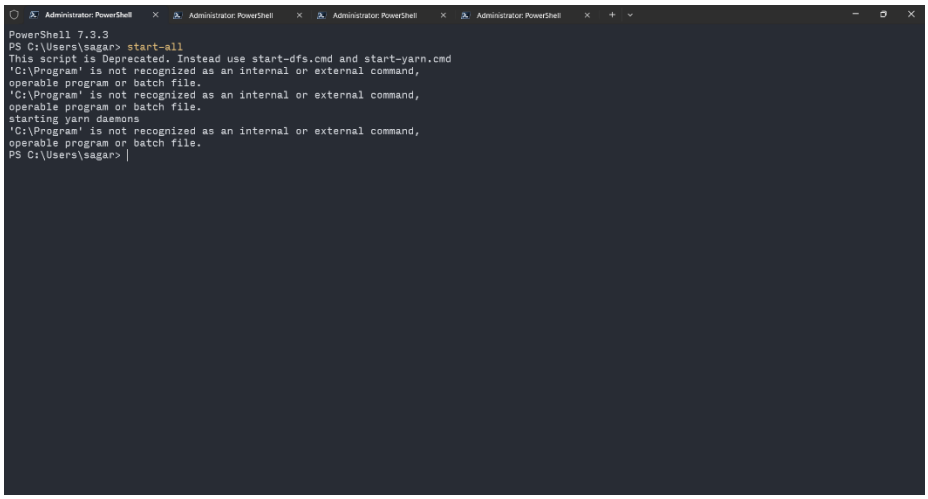
<property>
<name>datanucleus.schema.validateTables</name>
<value>true</value>
<description>validates existing schema against code. turn this on if you want to verify existing schema</description>
</property>

```
<property>
    <name>javax.jdo.option.ConnectionDriverName</name>
    <value>com.mysql.jdbc.Driver</value>
    <description>Driver class name for a JDBC metastore</description>
</property>
```

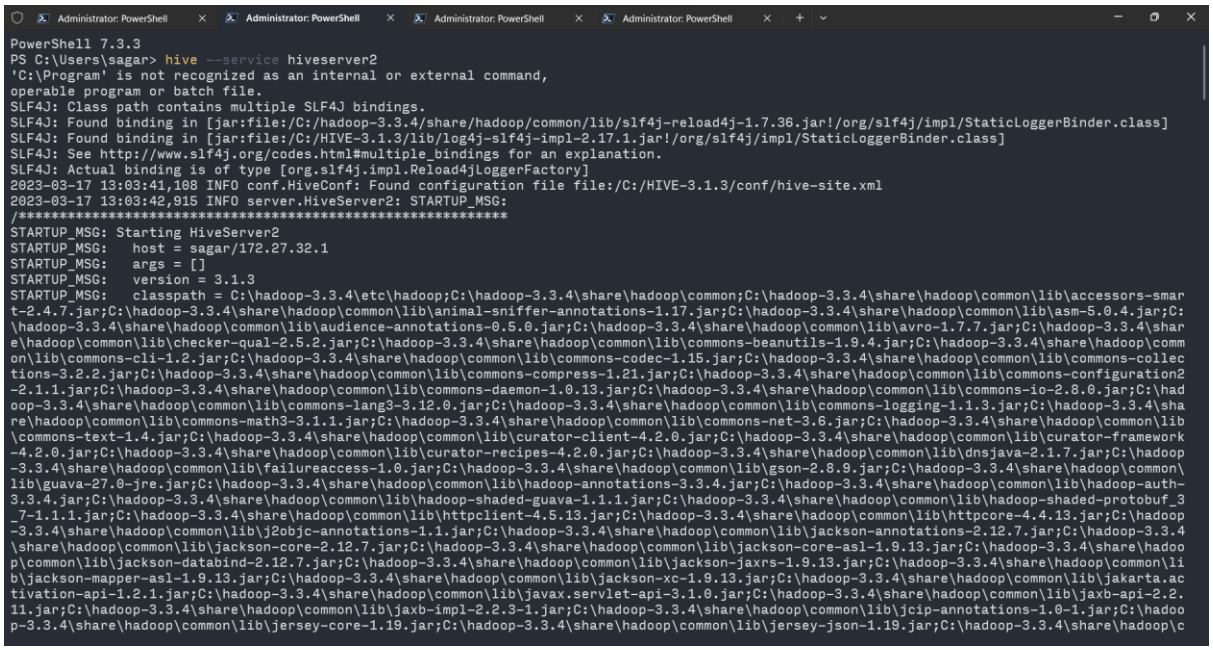
Install the .jar file from https://mvnrepository.com/artifact/com.mysql/mysql-connector-j/8.0.32 and store it in the lib folder.

Open Powershell in administrative mode and run

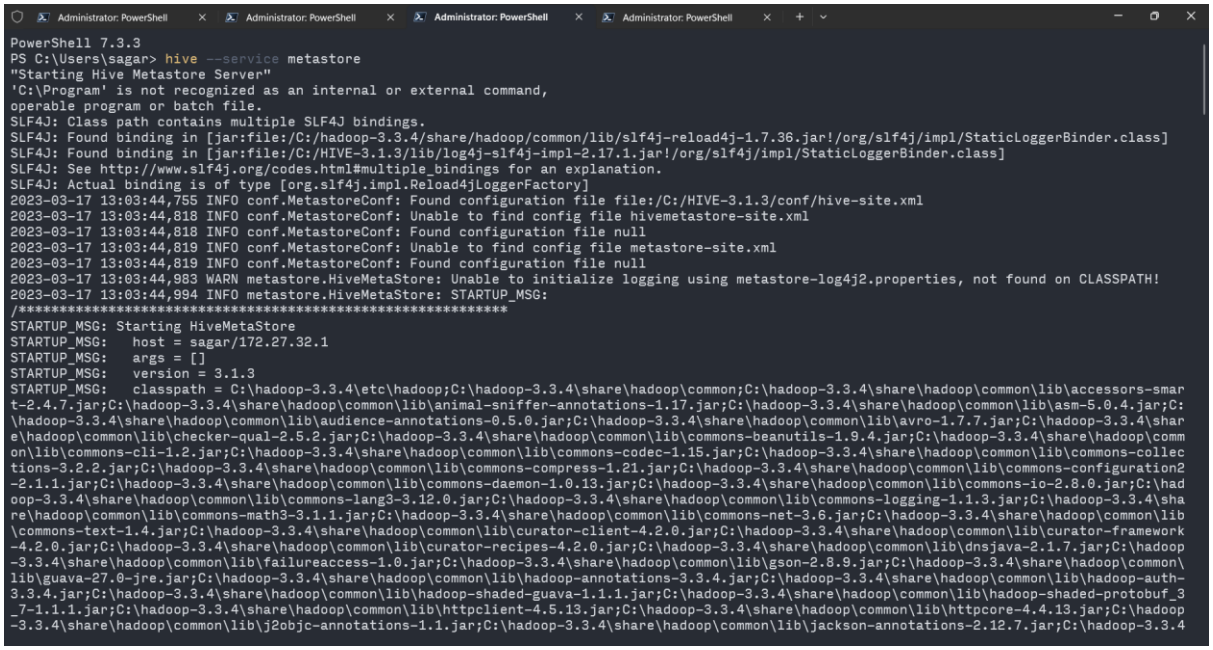
Start-all to run the Hadoop servers.



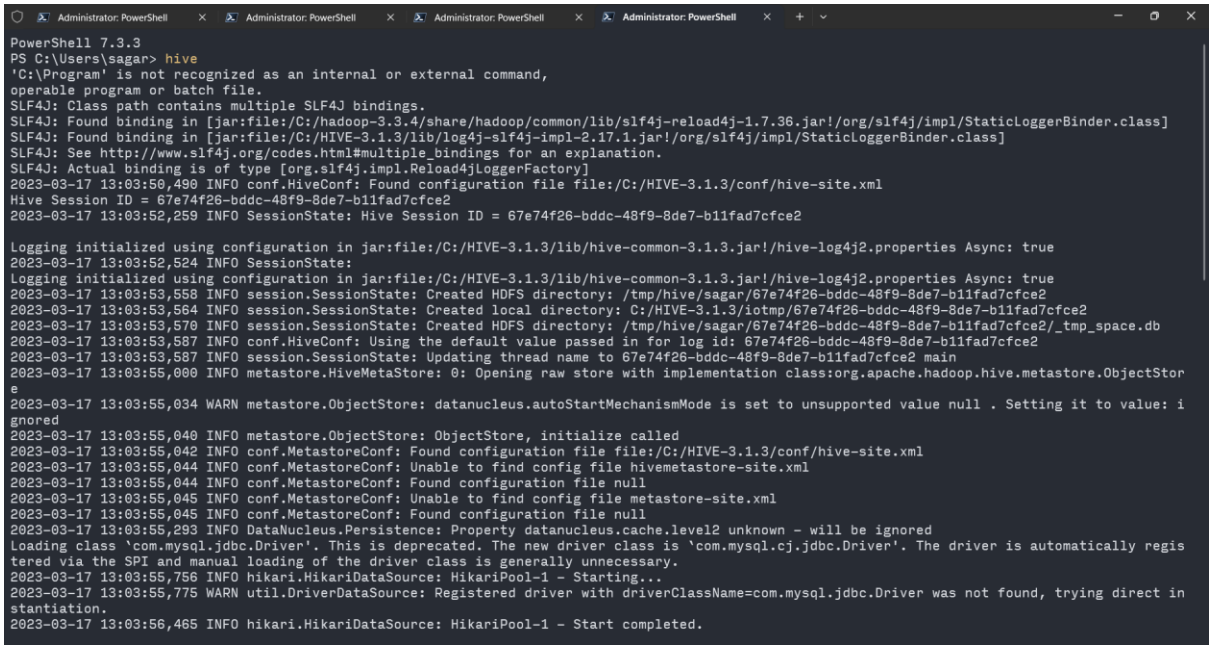
Start the Hive metastore service by running the following command in the command prompt: "hive --service metastore"



Start the Hive server by running the following command in the command prompt: "hive --service hiveserver2"



Then run hive.



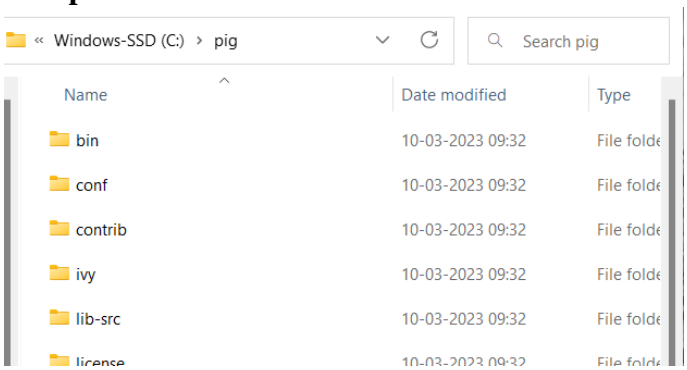
PRACTICAL 12

Pig Installation and Queries

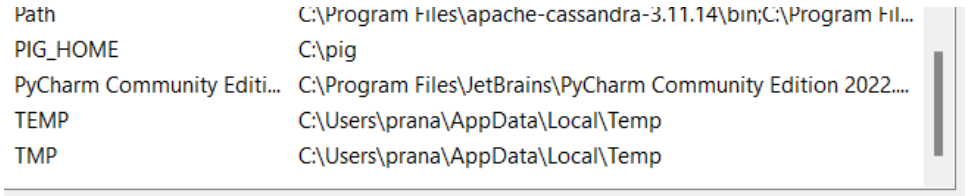
Steps for installation:

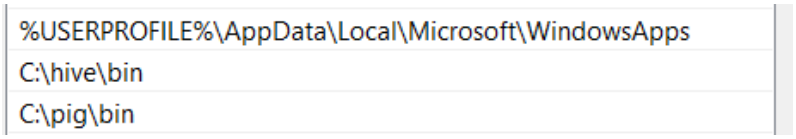
1. **Download pig from official page. Download pig-0.17.0.tar.gz file:** https://downloads.apache.org/pig/pig-0.17.0/

2. **Unzip file**

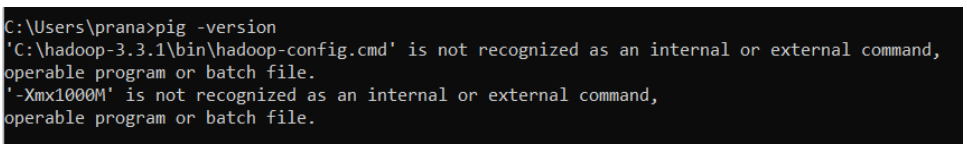


3. **Set environment variables**





4. **Check pig version**



5. **If received above error, solve by changing pig.cmd file as below**

```
40  setlocal enabledelayedexpansion
41
42  set HADOOP_BIN_PATH=%HADOOP_HOME%\libexec
43
```

6. **Try pig –version command again.**

```
PS C:\Users\Admin> cd D:/
PS D:\> pig -version
Apache Pig version 0.17.0 (r1797386)
compiled Jun 02 2017, 15:41:58
```

```
C:\Users\prana>pig -version
'C:\Program' is not recognized as an internal or external command,
operable program or batch file.
Apache Pig version 0.17.0 (r1797386)
compiled Jun 02 2017, 15:41:58
```

7. **Try running pig in local mode or in the hdfs mode**

a. **Local mode:**

```
C:\Users\prana>pig -x local
'C:\Program' is not recognized as an internal or external command,
operable program or batch file.
2023-03-10 09:48:56,048 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2023-03-10 09:48:56,049 INFO pig.ExecTypeProvider: Picked LOCAL as the ExecType
2023-03-10 09:48:56,596 [main] INFO  org.apache.pig.Main - Apache Pig version 0.17.0 (r1797386) compiled Jun 02 2017, 1
:41:58
2023-03-10 09:48:56,596 [main] INFO  org.apache.pig.Main - Logging error messages to: C:\hadoop-3.3.1\logs\pig_16784219
6584.log
2023-03-10 09:48:56,667 [main] INFO  org.apache.pig.impl.util.Utils - Default bootup file C:\Users\prana/.pigbootup not
found
2023-03-10 09:48:56,930 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecate
. Instead, use mapreduce.jobtracker.address
2023-03-10 09:48:56,935 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to had
op file system at: file:///
2023-03-10 09:48:57,507 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per.checksum is deprec
ted. Instead, use dfs.bytes-per-checksum
2023-03-10 09:48:57,567 [main] INFO  org.apache.pig.PigServer - Pig Script ID for the session: PIG-default-bcd2bc7b-208
-4d2b-99fa-9428bad14192
2023-03-10 09:48:57,567 [main] WARN  org.apache.pig.PigServer - ATS is disabled since yarn.timeline-service.enabled set
to false
grunt>
```

```
PS C:\Users\Admin> cd D:/
PS D:\> pig -version
Apache Pig version 0.17.0 (r1797386)
compiled Jun 02 2017, 15:41:58
PS D:\> pig -x local
2023-04-12 12:29:29,567 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2023-04-12 12:29:29,567 INFO pig.ExecTypeProvider: Picked LOCAL as the ExecType
2023-04-12 12:29:29,842 [main] INFO  org.apache.pig.Main - Apache Pig version 0.17.0 (r1797386) compiled Jun 02 2017, 15
:41:58
2023-04-12 12:29:29,842 [main] INFO  org.apache.pig.Main - Logging error messages to: D:\hadoop-env\hadoop-3.3.0\logs\pi
g_1681282769828.log
2023-04-12 12:29:29,874 [main] INFO  org.apache.pig.impl.util.Utils - Default bootup file C:\Users\Admin/.pigbootup not
found
2023-04-12 12:29:29,974 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated
. Instead, use mapreduce.jobtracker.address
2023-04-12 12:29:29,976 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hado
op file system at: file:///
2023-04-12 12:29:30,119 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per.checksum is depreca
ted. Instead, use dfs.bytes-per-checksum
2023-04-12 12:29:30,135 [main] INFO  org.apache.pig.PigServer - Pig Script ID for the session: PIG-default-ad6278fe-e8e4
-434d-86a7-c7d1985f9f6b
2023-04-12 12:29:30,135 [main] WARN  org.apache.pig.PigServer - ATS is disabled since yarn.timeline-service.enabled set
to false
grunt>
```

Pig commands:

1. **Load:** Loads the data from the file system.

```
grunt> a = load 'data.txt' using PigStorage(',') as (lines:int);
2023-04-10 18:05:58,358 [main] INFO  org.apache.hadoop.conf.Configura
tion.deprecation - io.bytes.per.checksum is deprecated. Instead, use
dfs.bytes-per-checksum
grunt>
```

2. **Dump :** Executes the relation. Used to display the output

```
grunt> a = load 'data.txt' as (lines);
2023-04-10 18:08:02,078 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - i
o.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,2,3,4)
(7,8,9,4)
(3,5,7,1)
(1,5,9,7)
grunt>
```

3. **Describe:** To describe the relation

```
grunt> describe a;
a: {lines: bytearray}
grunt>
```

4. **Pig -x local file.pig :** To execute the pig script

```
a = load 'data.txt' as (lines);
dump a;
describe a;
```

```
C:\Users\prana>pig -x local commands.pig
```

```
(1,2,3,4)
(7,8,9,4)
(3,5,7,1)
(1,5,9,7)
a: {lines: bytearray}
2023-04-10 18:11:33,175 [main] INFO
nds and 950 milliseconds (3950 ms)
```

5. **Cross :** To perform the cross product of 2 or more relations. It is an expensive operation. Displays the combined result of the relations.

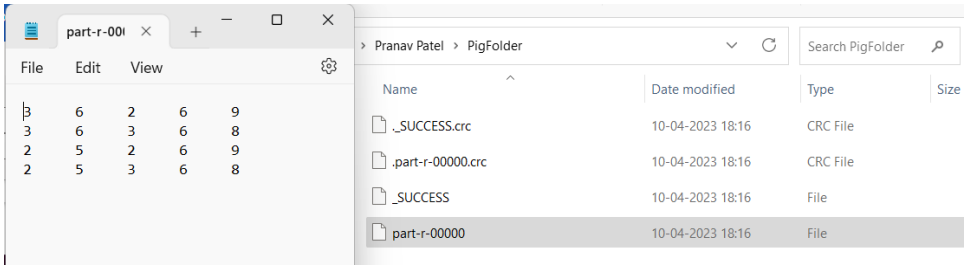
```
grunt> cat pcross1.txt
2,5
3,6grun
grunt> cat pcross2.txt
3,6,8
2,6,9grunt>a= load 'pcr
```

```
grunt> a = load 'pcross1.txt' using PigStorage(',') as (a1:int,a2:int);
2023-04-10 18:14:18,881 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - i
o.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> b= load 'pcross2.txt' using PigStorage(',') as (b1:int,b2:int,b3:int);
2023-04-10 18:15:11,786 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - i
o.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> result = cross a,b;
grunt> dump result;
```

```
(3,6,2,6,9)
(3,6,3,6,8)
(2,5,2,6,9)
(2,5,3,6,8)
grunt>
```

6. **Store:** To store the output relation into a folder. Folder will contain another file where the result will be stored

```
grunt> store result into 'PigFolder';
```



7. **Filter :** Will filter input based on a criteria provided.

```
grunt> a = load 'filter.txt' using PigStorage(',') as (a1:int,a2:int);
2023-04-10 18:19:10,168 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - i
o.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
2023-04-10 18:19:10,202 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - i
o.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,2)
(2,8)
(4,5)
(3,2)
(9,1)
(5,2)
(1,0)
```

```
grunt> result = filter a by a2==2;
grunt> dump result;
```

```
apRedU
(1,2)
(3,2)
(5,2)
```

8. **Foreach :** Generates data transformations based on columns of data.

```
grunt> a = load 'data.txt' using PigStorage(',') as (a1:int,a2:int,a3:int,a4:int);
2023-04-11 14:51:56,168 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation
ted. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,2,3,4)
(7,8,9,4)
(3,5,7,1)
(1,5,9,7)
grunt>
```

```
grunt> fe = foreach a generate a1,a2;
grunt> dump fe;
```

```
(1,2)
(7,8)
(3,5)
(1,5)
grunt>
```

9. **Group:** Group operator is used to group the data in one or more relations. It groups the tuples that contain a similar group key. If the group key has more than one field, it treats it as tuple otherwise it will be the same type as that of the group key. In a result, it provides a relation that contains one tuple per group.

   Data:

```
Jason,Roy,1
Jim,Halpert,2
Michael,Scott,3
Jake,Peralta,4
Jason,Bourne,5
Michael,Scarn,6
```

```
grunt> a = load 'input.txt' using PigStorage(',') as (fname:chararray,lname:chararray,id:int);
2023-04-11 15:00:10,068 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.byte
ted. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(Jason,Roy,1)
(Jim,Halpert,2)
(Michael,Scott,3)
(Jake,Peralta,4)
(Jason,Bourne,5)
(Michael,Scarn,6)
grunt>
```

```
grunt> groupfname = group a by fname;
grunt> dump groupfname;
```

```
(Jim,{(Jim,Halpert,2)})
(Jake,{(Jake,Peralta,4)})
(Jason,{(Jason,Bourne,5),(Jason,Roy,1)})
(Michael,{(Michael,Scarn,6),(Michael,Scott,3)})
grunt>
```

10. **Limit :** Limit no of output tuples

```
grunt> a = load 'data.txt' using PigStorage(',') as (a1:int,a2:int);
2023-04-11 16:37:45,569 [main] INFO  org.apache.hadoop.conf.Configuration.d
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,2)
(7,8)
(3,5)
(1,5)
grunt> result = limit a 2;
grunt> dump result;
```

```
Total input paths to process : 1
(1,2)
(7,8)
grunt>
```

11. **Order by :** The Apache Pig ORDER BY operator sorts a relation based on one or more fields. It maintains the order of tuples

```
grunt> a = load 'data.txt' using PigStorage(',') as (a1:int,a2:int);
2023-04-11 16:37:45,569 [main] INFO  org.apache.hadoop.conf.Configurati
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,2)
(7,8)
(3,5)
(1,5)
grunt> result = order a by a1 desc;
grunt> dump result;
```

```
(7,8)
(3,5)
(1,5)
(1,2)
grunt>
```

12. **Split :** The Apache Pig SPLIT operator breaks the relation into two or more relations according to the provided expression. Here, a tuple may or may not be assigned to one or more than one relation.

```
grunt> a = load 'data.txt' using PigStorage(',') as (a1:int,a2:int);
2023-04-11 16:37:45,569 [main] INFO  org.apache.hadoop.conf.Configurati
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
 Total input paths to process : 1
(1,2)
(7,8)
(3,5)
(1,5)
grunt> split a into x if a1<=2, y if a1>2;
grunt> dump x
```

```
 Total input paths to process : 1
(1,2)
(1,5)
grunt> dump y;
```

```
 Total input
(7,8)
(3,5)
grunt>
```

13. **Distinct : Used to remove duplicate tuples in a relation. Pig sorts the data and then eliminated duplicates**

```
grunt> a = load 'distinct.txt' using PigStorage(',') as (a1:int,a2:int,a3:int);
2023-04-11 16:43:55,759 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> dump a;
```

```
(1,3,5)
(2,1,4)
(1,3,5)
(1,4,2)
(2,1,4)
grunt> result = distinct a;
grunt> dump result;
```

```
(1,3,5)
(1,4,2)
(2,1,4)
grunt>
```

14. Join

The JOIN operator is used to combine records from two or more relations. While performing a join operation, we declare one (or a group of) tuple(s) from each relation, as keys. When these keys match, the two particular tuples are matched, else the records are dropped. Joins can be of the following types:

a. **Self Join :** Used to join a table with itself, as if there are 2 relations, temporarily renaming at least 1 relation

```
grunt> cat orders.txt
102,2009-10-08 00:00:00,3,3000
100,2009-10-08 00:00:00,3,1500
101,2009-11-20 00:00:00,2,1560
103,2008-05-20 00:00:00,4,2060
105,2010-03-29 00:00:00,7,4500g
```

```
grunt> cat customers.txt
1,Ramesh,32,Ahemdabad,2000.00
2,Khilan,25,Delhi,1500.00
3,Kaushik,23,Kota,2000.00
4,Bharat,25,Mumbai,6500.00
5,Sachin,27,Bhopal,8500.00
6,Komal,22,MP,4500.0
7,Muffy,24,Indore,10000.0grunt>
```

```
grunt> a = load 'customers.txt' using PigStorage(',') as (id:int,name:chararray,age:int,address:char
array,salary:int);
2023-04-11 16:50:54,017 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> b = load 'customers.txt' using PigStorage(',') as (id:int,name:chararray,age:int,address:char
array,salary:int);
2023-04-11 16:51:47,877 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> result = join a by id, b by id;
grunt> dump result;
```

```
 Total input paths to process : 1
(1,Ramesh,32,Ahemdabad,2000,1,Ramesh,32,Ahemdabad,2000)
(2,Khilan,25,Delhi,1500,2,Khilan,25,Delhi,1500)
(3,Kaushik,23,Kota,2000,3,Kaushik,23,Kota,2000)
(4,Bharat,25,Mumbai,6500,4,Bharat,25,Mumbai,6500)
(5,Sachin,27,Bhopal,8500,5,Sachin,27,Bhopal,8500)
(6,Komal,22,MP,4500,6,Komal,22,MP,4500)
(7,Muffy,24,Indore,10000,7,Muffy,24,Indore,10000)
```

b. **Inner Join :** Also referred to as Equijoin. Returns rows if there is a match in both tables.

```
grunt> a = load 'customers.txt' using PigStorage(',') as (id:int,name:chararray,age:int,address:char
array,salary:int);
2023-04-11 16:50:54,017 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
```

```
grunt> b = load 'orders.txt' using PigStorage(',') as (oid:int,date:chararray,customer_id:int,amount
:int);
2023-04-11 16:53:31,889 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
```

```
grunt> c = join a by id,b by customer_id;
grunt> dump c;
```

```
 Total input paths to process : 1
(2,Khilan,25,Delhi,1500,101,2009-11-20 00:00:00,2,1560)
(3,Kaushik,23,Kota,2000,100,2009-10-08 00:00:00,3,1500)
(3,Kaushik,23,Kota,2000,102,2009-10-08 00:00:00,3,3000)
(4,Bharat,25,Mumbai,6500,103,2008-05-20 00:00:00,4,2060)
(7,Muffy,24,Indore,10000,105,2010-03-29 00:00:00,7,4500)
grunt>
```

c. **Outer Join :** Returns all rows from at least one of the relations. Can be Left outer join, Right outer join, or full outer join.
i. Left outer join : Returns all rows from the left table, even if there are no matches in the right relation.

ii. Right outer join : Returns all rows from the right table, even if there are no matches in the left table

iii. Full Outer Join : Returns all rows when there is a match in match in one of the relations.

```
grunt> d = join a by id LEFT OUTER, b by customer_id;
grunt> dump d;
(1,Ramesh,32,Ahemdabad,2000,,,,)
(2,Khilan,25,Delhi,1500,101,2009-11-20 00:00:00,2,1560)
(3,Kaushik,23,Kota,2000,100,2009-10-08 00:00:00,3,1500)
(3,Kaushik,23,Kota,2000,102,2009-10-08 00:00:00,3,3000)
(4,Bharat,25,Mumbai,6500,103,2008-05-20 00:00:00,4,2060)
(5,Sachin,27,Bhopal,8500,,,,)
(6,Komal,22,MP,4500,,,,)
(7,Muffy,24,Indore,10000,105,2010-03-29 00:00:00,7,4500)
grunt>
```

```
grunt> e = join a by id Right, b by customer_id;
grunt> dump e;
(2,Khilan,25,Delhi,1500,101,2009-11-20 00:00:00,2,1560)
(3,Kaushik,23,Kota,2000,100,2009-10-08 00:00:00,3,1500)
(3,Kaushik,23,Kota,2000,102,2009-10-08 00:00:00,3,3000)
(4,Bharat,25,Mumbai,6500,103,2008-05-20 00:00:00,4,2060)
(7,Muffy,24,Indore,10000,105,2010-03-29 00:00:00,7,4500)
grunt>
```

```
grunt> f = join a by id full outer, b by customer_id;
grunt> dump f;
(1,Ramesh,32,Ahemdabad,2000,,,,)
(2,Khilan,25,Delhi,1500,101,2009-11-20 00:00:00,2,1560)
(3,Kaushik,23,Kota,2000,100,2009-10-08 00:00:00,3,1500)
(3,Kaushik,23,Kota,2000,102,2009-10-08 00:00:00,3,3000)
(4,Bharat,25,Mumbai,6500,103,2008-05-20 00:00:00,4,2060)
(5,Sachin,27,Bhopal,8500,,,,)
(6,Komal,22,MP,4500,,,,)
(7,Muffy,24,Indore,10000,105,2010-03-29 00:00:00,7,4500)
grunt>
```

15. Creating the csv file containing sales records

Data:

'12-03-2020','shirts','250','Cash','Joe','New York'

'01-12-2022','trousers','450','Card','John','Los Angeles'

'19-07-2021','backpack','1000','Cash','John','Pennsylvania'

'25-09-2023','suitcase','2500','Card','Neo','New York'

'21-10-2019','bottle','100','Card','Michael','Colorado'

'31-01-2017','soap','50','Cash','Jim','Scranton'

'28-02-2022','telephone','500','Cash','Calvin','Dallas'

'09-11-2018','batteries','40','Cash','Dwayne','New Jersey'

'17-08-2019','tie','140','Card','Adam','New York'

16. Load the records and group them based on the city

```
grunt> sales = load 'sales.csv' using PigStorage(',') as (tdate:chararray,product:chararray,price:ch
ararray,ptype:chararray,name:chararray,city:chararray);
2023-04-11 17:05:02,274 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per
.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> gbcity = group sales by city;
grunt> dump gbcity
Total input paths to process : 1
('Dallas',{('28-02-2022','telephone','500','Cash','Calvin','Dallas')})
('Colorado',{('21-10-2019','bottle','100','Card','Michael','Colorado')})
('New York',{('17-08-2019','tie','140','Card','Adam','New York'),('25-09-2023','suitcase','2500','Ca
rd','Neo','New York'),('12-03-2020','shirts','250','Cash','Joe','New York')})
('Scranton',{('31-01-2017','soap','50','Cash','Jim','Scranton')})
('New Jersey',{('09-11-2018','batteries','40','Cash','Dwayne','New Jersey')})
('Los Angeles',{('01-12-2022','trousers','450','Card','John','Los Angeles')})
('Pennsylvania',{('19-07-2021','backpack','1000','Cash','John','Pennsylvania')})
grunt>
```

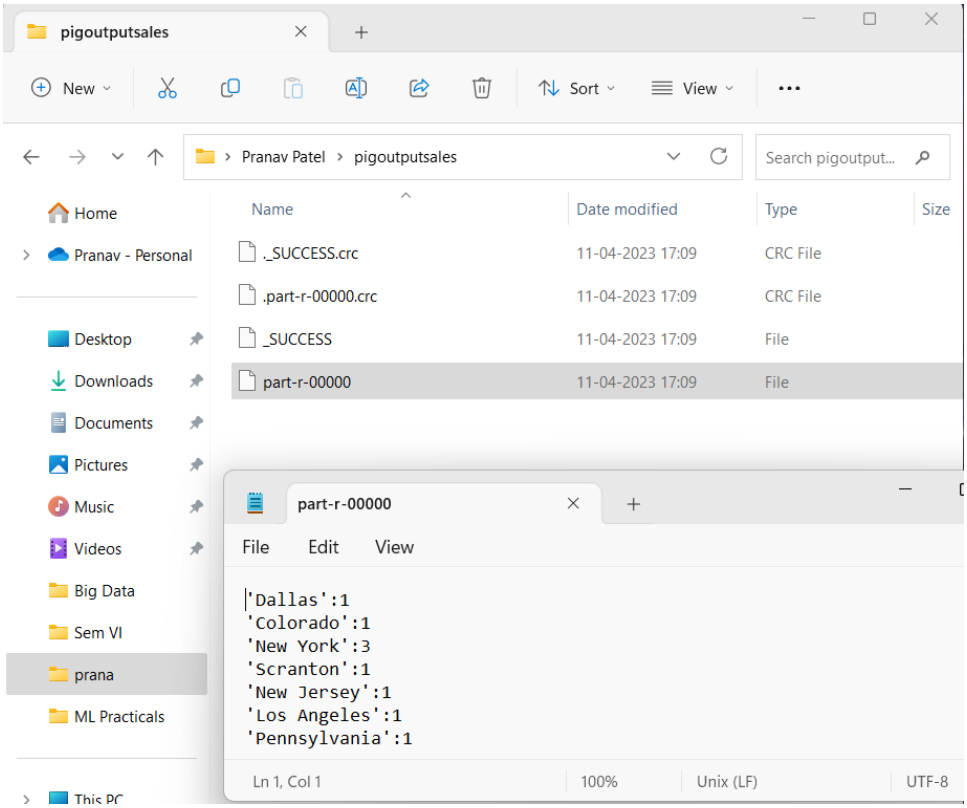
17. Count the number of sales in each city.

Note: Concat command will concatenate 2 or more fields of the same type

```
grunt> ccity = foreach gbcity generate CONCAT((chararray)$0,CONCAT(':',(chararray)COUNT($1)));
grunt> dump ccity;
('Dallas':1)
('Colorado':1)
('New York':3)
('Scranton':1)
('New Jersey':1)
('Los Angeles':1)
('Pennsylvania':1)
```

18. Store the sales records obtained earlier into a folder and verify them

```
grunt> store ccity into 'pigoutputsales' using PigStorage('\t');
```

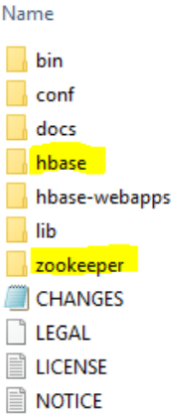


PRACTICAL 13
Hbase Installation

Name: Mohd Bilal Ali **Roll No: KCTBCS(005)** **Date:**

Pre-requisites: We are going to make a standalone setup of HBase in our machine which requires us to

- Install Java JDK 1.8 - We can download and install it from https://www.oracle.com/java/technologies/downloads/ and set JAVA_HOME in environment variable.
- Download Hbase-bin - Download Apache Hbase-2.2.5 from https://archive.apache.org/dist/hbase/2.2.5/



Steps:

- **Step 1 – Extract all files from the archive**
- **Step 2 – Create folders named "hbase" and "zookeeper"**
- **Step 3 – Deleting line in HBase.cmd**

  Open C:\hbase-2.2.5\bin\hbase.cmd in any text editor.

  Search for line **%HEAP_SETTINGS% and remove the highlighted part.**

  ```
  set java_arguments=%HEAP_SETTINGS%
  %HBASE_OPTS% -classpath "%CLASSPATH%" %CLASS%
  %hbase-command-arguments%
  ```

- **Step 4 – Adding lines in hbase-env.cmd**

  Open C:\hbase-2.2.5\conf\hbase-env.cmd in any text editor.

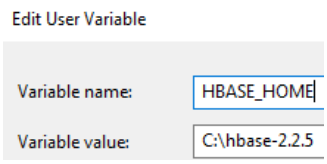
  Add the below lines in the file after the comment session.

  ```
  set JAVA_HOME=%JAVA_HOME%
  set HBASE_CLASSPATH=%HBASE_HOME%\lib\client-facing-thirdparty\*
  set HBASE_HEAPSIZE=8000
  set HBASE_OPTS="-XX:+UseConcMarkSweepGC" "-Djava.net.preferIPv4Stack=true"
  ```

```
set SERVER_GC_OPTS="-verbose:gc" "-XX:+PrintGCDetails" "-XX:+PrintGCDateStamps" %HBASE_GC_OPTS%
set HBASE_USE_GC_LOGFILE=true

set HBASE_JMX_BASE="-Dcom.sun.management.jmxremote.ssl=false" "-Dcom.sun.management.jmxremote.authenticate=false"

set HBASE_MASTER_OPTS=%HBASE_JMX_BASE% "-Dcom.sun.management.jmxremote.port=10101"
set HBASE_REGIONSERVER_OPTS=%HBASE_JMX_BASE% "-Dcom.sun.management.jmxremote.port=10102"
set HBASE_THRIFT_OPTS=%HBASE_JMX_BASE% "-Dcom.sun.management.jmxremote.port=10103"
set HBASE_ZOOKEEPER_OPTS=%HBASE_JMX_BASE% -Dcom.sun.management.jmxremote.port=10104"
set HBASE_REGIONSERVERS=%HBASE_HOME%\conf\regionservers
set HBASE_LOG_DIR=%HBASE_HOME%\logs
 set HBASE_IDENT_STRING=%USERNAME%
set HBASE_MANAGES_ZK=true
```



- **Step 5 – Adding lines in hbase-site.xml**

Open C:\hbase-2.2.5\conf\hbase-site.xml in any text editor.

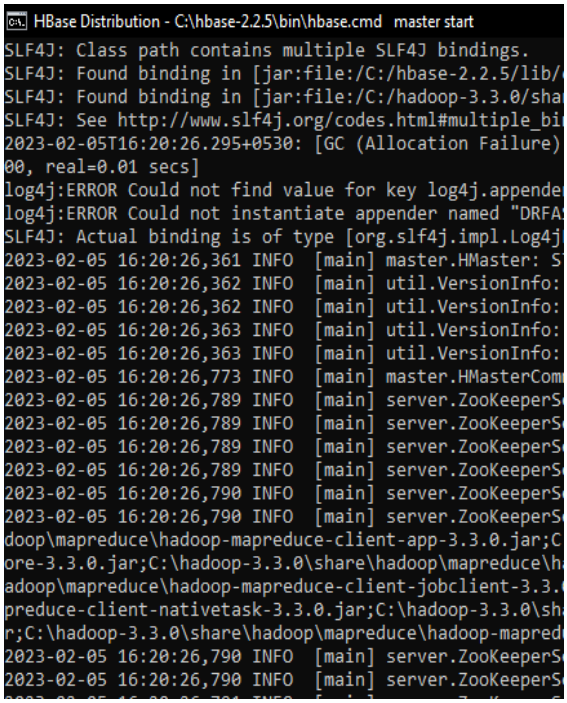
Add the below lines inside the <configuration> tag.

```
<property>
  <name>hbase.rootdir</name>
  <value>file:///C:/Documents/hbase-2.2.5/hbase</value>
</property>
<property>
  <name>hbase.zookeeper.property.dataDir</name>
  <value>/C:/Documents/hbase-2.2.5/zookeeper</value>
</property>
<property>
   <name> hbase.zookeeper.quorum</name>
  <value>localhost</value>
</property>
```

- **Step 6 – Setting Environment Variables:**

Input the following:

  - Variable name: HBASE_HOME
  - Variable Value: Put the path of the Hbase folder.



Starting the HBASE shell:

- **Step 1 – Use start-hbase.cmd:**

Go to the bin folder of hbase and start a cmd prompt there

Then type: **start-hbase.cmd**

- **Step 2 – Start hbase shell:**

```
C:\hbase-2.2.5\bin>hbase shell
HBase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
For Reference, please visit: http://hbase.apache.org/2.0/book
Version 2.2.5, rf76a601273e834267b55c0cda12474590283fd4c, 202
Took 0.0020 seconds
'stty' is not recognized as an internal or external command,
operable program or batch file.
hbase(main):001:0>
```

In HBase, interactive shell mode is used to interact with HBase for table operations, table management, and data modeling.

Hbase Commands

General commands

In Hbase, general commands are categorized into following commands

- **Status**
- **Version**
- **Table_help (scan, drop, get, put, disable, etc.)**

- **Whoami**

To get enter into HBase shell command, first of all, we have to execute the code as mentioned below

hbase Shell

Once we get to enter into HBase shell, we can execute all shell commands mentioned below. With the help of these commands, we can perform all type of table operations in the HBase shell mode.

Let us look into all of these commands and their usage one by one with an example.

Status

Syntax: status

This command will give details about the system status like a number of servers present in the cluster, active server count, and average load value. You can also pass any particular parameters depending on how detailed status you want to know about the system. The parameters can be **'summary', 'simple', or 'detailed'**, the default parameter provided is "summary".

Example:

```
hbase(main):023:0> status
1 active master, 0 backup masters, 1 servers, 0 dead,
Took 0.0190 seconds
hbase(main):024:0> status 'simple'
active master:  KIRANBHAI:16000 1675594226913
0 backup masters
1 live servers
    KIRANBHAI:16020 1675594229774
        requestsPerSecond=0.0, numberOfOnlineRegions=
ores=6, numberOfStorefiles=6, storefileUncompressedSi
 storefileIndexSizeKB=0, readRequestsCount=88, filter
1, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, total
urrentCompactedKVs=0, compactionProgressPct=NaN, copr
0 dead servers
Aggregate load: 0, regions: 3
Took 0.0230 seconds
```

---

whoami

Syntax:

Syntax: Whoami

This command "whoami" is used to return the current HBase user information from the HBase cluster.

Example:

```
hbase(main):027:0> whoami
shahk (auth:SIMPLE)
    groups: docker-users, Administrators, Users
Took 0.0150 seconds
```

Tables Managements commands

These commands will allow programmers to create tables and table schemas with rows and column families.

The following are Table Management commands

- Create
- List
- Describe
- Disable
- Disable_all
- Enable
- Enable_all
- Drop

- Drop_all
- Show_filters
- Alter
- Alter_status

Let us look into various command usage in HBase with an example.

Create

Syntax: create <tablename>, <columnfamilyname>

Example:

Creating a table named 'kccs' with column family 'students'

```
hbase(main):010:0> create 'kccs','students'
Created table kccs
Took 1.2880 seconds
=> Hbase::Table - kccs
```

The above example explains how to create a table in HBase with the specified name given according to the dictionary or specifications as per column family. In addition to this we can also pass some table-scope attributes as well into it.

In order to check whether the table 'kccs' is created or not, we have to use the **"list"** command as mentioned below.

List

Syntax:list

```
hbase(main):028:0> list
TABLE
kccs
1 row(s)
Took 0.0100 seconds
=> ["kccs"]
```

- "List" command will display all the tables that are present or created in HBase
- The output showing in above screen shot is currently showing the existing tables in HBase
- We can filter output values from tables by passing optional regular expression parameters

---

Describe

Syntax:describe <table name>

Example:

```
hbase(main):011:0> describe 'kccs'
Table kccs is ENABLED
kccs
COLUMN FAMILIES DESCRIPTION
{NAME => 'students', VERSIONS => '1', EVICT_BLOCKS_ON_CLOSE => 'false', NEW_VERS
ION_BEHAVIOR => 'false', KEEP_DELETED_CELLS => 'FALSE', CACHE_DATA_ON_WRITE => '
false', DATA_BLOCK_ENCODING => 'NONE', TTL => 'FOREVER', MIN_VERSIONS => '0', RE
PLICATION_SCOPE => '0', BLOOMFILTER => 'ROW', CACHE_INDEX_ON_WRITE => 'false', I
N_MEMORY => 'false', CACHE_BLOOMS_ON_WRITE => 'false', PREFETCH_BLOCKS_ON_OPEN =
> 'false', COMPRESSION => 'NONE', BLOCKCACHE => 'true', BLOCKSIZE => '65536'}

1 row(s)

QUOTAS
0 row(s)
Took 0.0410 seconds
```

hbase(main):011:0>describe 'kccs'

This command describes the named table.

- It will give more information about column families present in the mentioned table
- In our case, it gives the description about table "kccs"

- It will give information about table name with column families, associated filters, versions and some more details.

---

disable

Syntax: disable <tablename>

Example: disable 'kccs'

```
hbase(main):029:0> disable 'kccs'
Took 0.7930 seconds
```

```
hbase(main):030:0> describe 'kccs'
Table kccs is DISABLED
```

- This command will start disabling the named table
- If table needs to be deleted or dropped, it has to disabled first

---

disable_all

Syntax: disable_all<"matching regex">

- This command will disable all the tables matching the given regex.
- The implementation is same as delete command (Except adding regex for matching)
- Once the table gets disable the user can able to delete the table from HBase
- Before delete or dropping table, it should be disabled first

---

Enable

Syntax: enable <tablename>

Example: enable 'kccs'

```
hbase(main):031:0> enable 'kccs'
Took 1.3070 seconds
```

- This command will start enabling the named table
- Whichever table is disabled, to retrieve back to its previous state we use this command
- If a table is disabled in the first instance and not deleted or dropped, and if we want to re-use the disabled table then we have to enable it by using this command.

---

show_filters

Syntax: show_filters

```
hbase(main):032:0> show_filters
DependentColumnFilter
KeyOnlyFilter
ColumnCountGetFilter
SingleColumnValueFilter
PrefixFilter
SingleColumnValueExcludeFilter
FirstKeyOnlyFilter
ColumnRangeFilter
ColumnValueFilter
TimestampsFilter
```

This command displays all the filters present in HBase like ColumnPrefix Filter, TimestampsFilter, PageFilter, FamilyFilter, etc.

---

drop

Syntax:drop <table name>

Example:

```
hbase(main):040:0> disable 'kccs'
Took 1.2760 seconds
hbase(main):041:0> drop 'kccs'
Took 0.2260 seconds
hbase(main):042:0> list
TABLE
0 row(s)
Took 0.0030 seconds
=> []
```

We have to observe below points for drop command

- To delete the table present in HBase, first we have to disable it
- To drop the table present in HBase, first we have to disable it
- So either table to drop or delete first the table should be disable using disable command
- Before execution of this command, it is necessary that we disable table “kccs”

---

drop_all

Syntax: drop_all<"regex">

- This command will drop all the tables matching the given regex
- Tables have to disable first before executing this command using disable_all
- Tables with regex matching expressions are going to drop from HBase

---

alter

Syntax: alter <tablename>, NAME=><column familyname>, VERSIONS=>5

This command alters the column family schema. To understand what exactly it does, we have explained it here with an example.

Example: Altering table kccs, by adding a new column family named ‘teachers’

```
hbase(main):012:0> alter 'kccs', {NAME => 'teachers'}
Updating all regions with the new schema...
1/1 regions updated.
Done.
Took 2.4870 seconds
```

Data manipulation commands

These commands will work on the table related to data manipulations such as putting data into a table, retrieving data from a table and deleting schema, etc.

The commands come under these are

- Count
- Put
- Get
- Delete
- Delete all
- Truncate
- Scan

Let look into these commands usage with an example.

Count

Syntax: count <'tablename'>, CACHE =>1000

- The command will retrieve the count of a number of rows in a table. The value returned by this one is the number of rows.
- Current count is shown per every 1000 rows by default.
- Count interval may be optionally specified.
- Default cache size is 10 rows.
- Count command will work fast when it is configured with right Cache.

Example:

```
hbase(main):033:0> count 'kccs'
1 row(s)
Took 0.0090 seconds
=> 1
```

Put

Syntax: put <'tablename'>,<'rowname'>,<'columnvalue'>,<'value'>

This command is used for following things

- It will put a cell 'value' at defined or specified table or row or column.
- It will optionally coordinate time stamp.

Example:

```
hbase(main):013:0> put 'kccs',1,'students:name','Dhruv'
Took 0.0550 seconds
hbase(main):014:0> put 'kccs',1,'students:roll','59'
Took 0.0030 seconds
hbase(main):015:0> scan 'kccs'
ROW                   COLUMN+CELL
 1                    column=students:name, timestamp=1675597005486, value=Dhruv
 1                    column=students:roll, timestamp=1675597017352, value=59
1 row(s)
Took 0.0220 seconds
hbase(main):016:0> get 'kccs', '1'
COLUMN                CELL
 students:name        timestamp=1675597005486, value=Dhruv
 students:roll        timestamp=1675597017352, value=59
1 row(s)
Took 0.0170 seconds
hbase(main):017:0> put 'kccs',1,'teachers:name','Mr. Naveen Pahuja'
Took 0.0060 seconds
hbase(main):018:0> scan 'kccs'
ROW                   COLUMN+CELL
 1                    column=students:name, timestamp=1675597005486, value=Dhruv
 1                    column=students:roll, timestamp=1675597017352, value=59
 1                    column=teachers:name, timestamp=1675597199115, value=Mr. N
                      aveen Pahuja
1 row(s)
Took 0.0080 seconds
hbase(main):019:0> scan 'kccs'
ROW                   COLUMN+CELL
 1                    column=students:name, timestamp=1675597005486, value=Dhruv
 1                    column=students:roll, timestamp=1675597017352, value=59
 1                    column=teachers:name, timestamp=1675597199115, value=Mr. N
                      aveen Pahuja
1 row(s)
Took 0.0080 seconds
```

- hbase> put 'kccs',1,'students:name','Dhruv'

Here we are placing values into table "kccs" under row 1, column family 'students' and column 'name'

- hbase> put 'kccs',1,'students:roll','59'

Here we are placing values into table "kccs" under row 1, column family 'students' and column 'roll'

- hbase> put 'kccs',1,'teachers:name','Mr. Naveen Pahuja'

Here we are placing values into table "kccs" under row 1, column family 'teachers' and column 'name'

Get

Syntax: get <'tablename'>, <'rowname'>, {< Additional parameters>}

Here <Additional Parameters> include TIMERANGE, TIMESTAMP, VERSIONS and FILTERS.

By using this command, you will get a row or cell contents present in the table. In addition to that you can also add additional parameters to it like TIMESTAMP, TIMERANGE,VERSIONS, FILTERS, etc. to get a particular row or cell content.

Example:

```
hbase(main):020:0> get 'kccs', '1', 'teachers'
COLUMN                CELL
 teachers:name        timestamp=1675597199115, value=Mr. Naveen Pahuja
1 row(s)
Took 0.0050 seconds
hbase(main):021:0> get 'kccs', '1', 'students'
COLUMN                CELL
 students:name        timestamp=1675597005486, value=Dhruv
 students:roll        timestamp=1675597017352, value=59
1 row(s)
Took 0.0060 seconds
```

Delete

Syntax:delete <'tablename'>,<'row name'>,<'column name'>

- This command will delete cell value at defined table of row or column.
- Delete must and should match the deleted cells coordinates exactly.
- When scanning, delete cell suppresses older versions of values.

Example: hbase> delete 'kccs',1,'students:roll'

```
hbase(main):034:0> delete 'kccs',1,'students:roll'
Took 0.0100 seconds
hbase(main):035:0> get 'kccs', '1', 'students'
COLUMN                CELL
 students:name        timestamp=1675597005486, value=Dhruv
1 row(s)
Took 0.0050 seconds
```

- The above execution will delete column ‘roll’ in the column family ‘students’ from the table ‘kccs’

deleteall

Syntax: deleteall <'tablename'>, <'rowname'>

- This Command will delete all cells in a given row.
- We can define optionally column names and time stamp to the syntax.
- Optionally we can mention column names in that.

Truncate

Syntax: truncate <tablename>

After truncate of an hbase table, the schema will present but not the records. This command performs 3 functions; those are listed below

- Disables table if it already presents
- Drops table if it already presents
- Recreates the mentioned table

Example:

```
hbase(main):036:0> truncate 'kccs'
Truncating 'kccs' table (it may take a while):
Disabling table...
Truncating table...
Took 2.1190 seconds
```

Scan

Syntax: scan <'tablename'>, {Optional parameters}

This command scans entire table and displays the table contents.

- We can pass several optional specifications to this scan command to get more information about the tables present in the system.
- Scanner specifications may include one or more of the following attributes.
- These are TIMERANGE, FILTER, TIMESTAMP, LIMIT, MAXLENGTH, COLUMNS, CACHE, STARTROW and STOPROW.

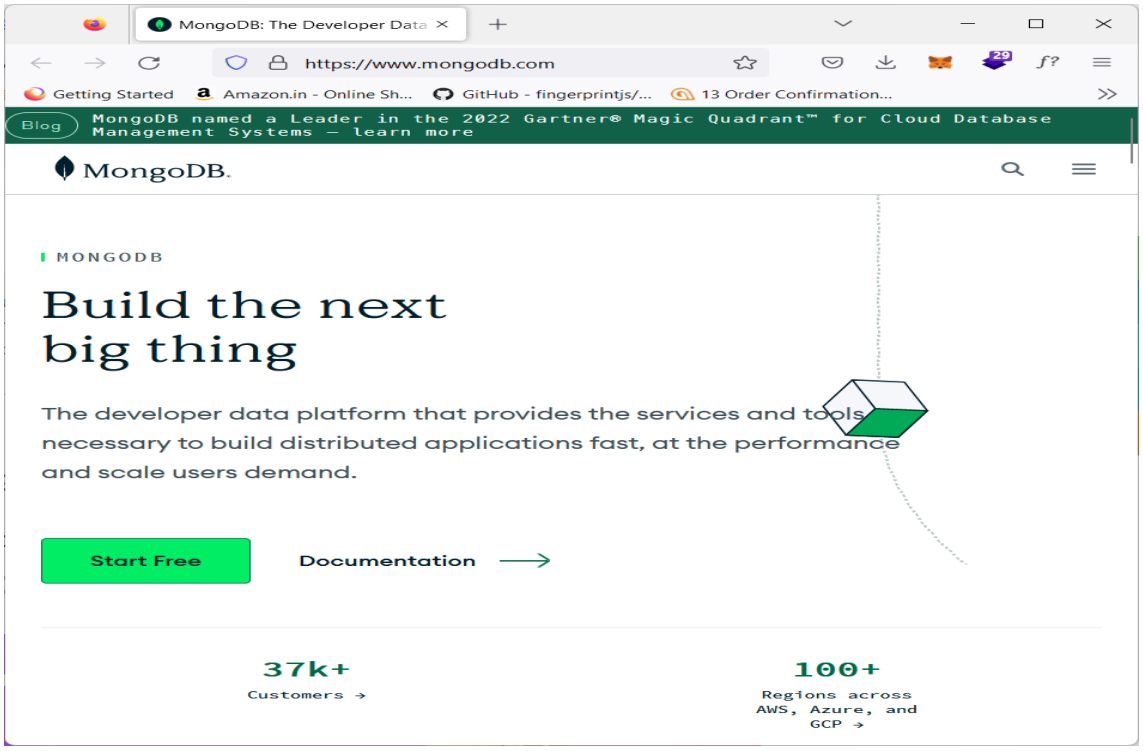
Example:

```
hbase(main):047:0> scan 'kccs'
ROW                     COLUMN+CELL
 1                      column=students:name, timestamp=1675600898787, value=Dhruv
1 row(s)
Took 0.0050 seconds
```

Name: Krishi Jain **Roll No. KCTBCS026** **Date: 16/11/2022**

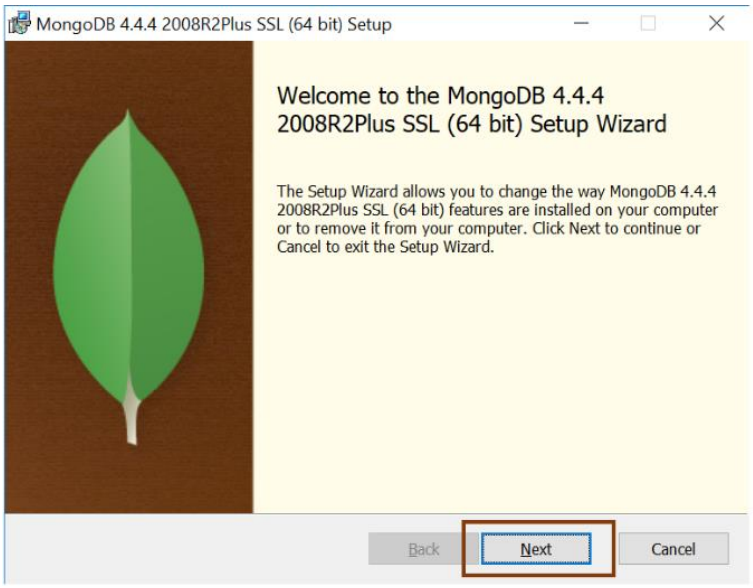
US-TCS-604 – Big Data Analytics
Practical 1 – Installation of MongoDB

Step 1: Navigate to the official MongoDB website i.e https://www.mongodb.com/

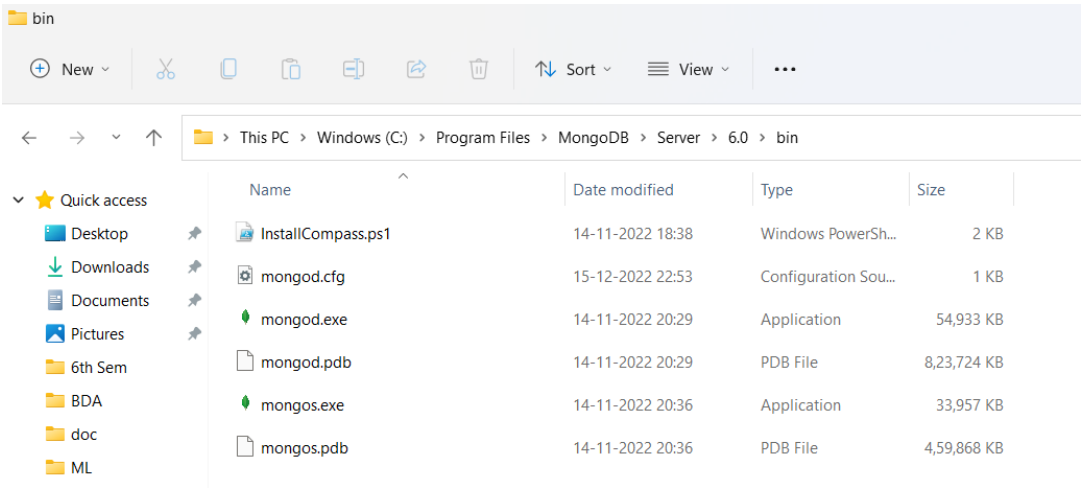


Step 2: Cross-check the Specifications and Download MongoDB

Step 3: Run the setup.exe file and click on next



Step 4: On completing the installation successfully, you will find the software package in your C:\Program Files\MongoDB\Server\6.0\bin



Step 5: Create an Environment Variable

Step 6: For Version 6 Install the mongodb shell zip file

Step 7: Extract it and copy it to C:\Program Files

Step 8: Open the folder

Step 9: Open the mongosh file once and then close it

Step 5: Create an Environment Variable and add a new path C:\Program Files\mongosh-1.6.1-win32-x64\bin

Step 6: Open command prompt and type mongosh

C:\Program Files>cd MongoDB/Server/5.0/bin

C:\Program Files\MongoDB\Server\5.0\bin>mongod.exe --dbpath "C:\Program Files\MongoDB\data"

{"t":{"$date":"2022-11-16T11:21:05.067+05:30"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"main","msg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2022-11-16T11:21:05.068+05:30"},"s":"I", "c":"NETWORK", "id":4915701, "ctx":"main","msg":"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":13},"incomingInternalClient":{"minWireVersion":0,"maxWireVersion":13},"outgoing":{"minWireVersion":0,"maxWireVersion":13},"isInternalClient":true}}}
{"t":{"$date":"2022-11-16T11:21:05.068+05:30"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main","msg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2022-11-16T11:21:05.069+05:30"},"s":"I", "c":"NETWORK", "id":4648602, "ctx":"main","msg":"Implicit TCP FastOpen in use."}
{"t":{"$date":"2022-11-16T11:21:05.071+05:30"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main","msg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2022-11-16T11:21:05.071+05:30"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"TenantMigrationDonorService","ns":"config.tenantMigrationDonors"}}
{"t":{"$date":"2022-11-16T11:21:05.072+05:30"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"TenantMigrationRecipientService","ns":"config.tenantMigrationRecipients"}}
{"t":{"$date":"2022-11-16T11:21:05.072+05:30"},"s":"I", "c":"CONTROL", "id":5945603, "ctx":"main","msg":"Multi threading initialized"}
{"t":{"$date":"2022-11-16T11:21:05.074+05:30"},"s":"I", "c":"CONTROL", "id":4615611, "ctx":"initandlisten","msg":"MongoDB starting","attr":{"pid":17272,"port":27017,"dbPath":"C:/Program Files/MongoDB/data","architecture":"64-bit","host":"DESKTOP-QAE50JI"}}
{"t":{"$date":"2022-11-16T11:21:05.075+05:30"},"s":"I", "c":"CONTROL", "id":23398, "ctx":"initandlisten","msg":"Target operating system minimum version","attr":{"targetMinOS":"Windows 7/Windows Server 2008 R2"}}
{"t":{"$date":"2022-11-16T11:21:05.075+05:30"},"s":"I", "c":"CONTROL", "id":23403, "ctx":"initandlisten","msg":"Build

Info","attr":{"buildInfo":{"version":"5.0.6","gitVersion":"212a8dbb47f07427dae194a9c75baec1d81d9259","modules":[],"allocator":"tcmalloc","environment":{"distmod":"windows","distarch":"x86_64","target_arch":"x86_64"}}}}
{"t":{"$date":"2022-11-16T11:21:05.075+05:30"},"s":"I", "c":"CONTROL", "id":51765, "ctx":"initandlisten","msg":"Operating System","attr":{"os":{"name":"Microsoft Windows 10","version":"10.0 (build 22000)"}}}
{"t":{"$date":"2022-11-16T11:21:05.076+05:30"},"s":"I", "c":"CONTROL", "id":21951, "ctx":"initandlisten","msg":"Options set by command line","attr":{"options":{"storage":{"dbPath":"C:\\Program Files\\MongoDB\\data"}}}}
{"t":{"$date":"2022-11-16T11:21:05.077+05:30"},"s":"E", "c":"CONTROL", "id":20557, "ctx":"initandlisten","msg":"DBException in initAndListen, terminating","attr":{"error":"NonExistentPath: Data directory C:\\Program Files\\MongoDB\\data not found. Create the missing directory or specify another path using (1) the --dbpath command line option, or (2) by adding the 'storage.dbPath' option in the configuration file."}}
{"t":{"$date":"2022-11-16T11:21:05.077+05:30"},"s":"I", "c":"REPL", "id":4784900, "ctx":"initandlisten","msg":"Stepping down the ReplicationCoordinator for shutdown","attr":{"waitTimeMillis":15000}}
{"t":{"$date":"2022-11-16T11:21:05.078+05:30"},"s":"I", "c":"COMMAND", "id":4784901, "ctx":"initandlisten","msg":"Shutting down the MirrorMaestro"}
{"t":{"$date":"2022-11-16T11:21:05.078+05:30"},"s":"I", "c":"SHARDING", "id":4784902, "ctx":"initandlisten","msg":"Shutting down the WaitForMajorityService"}
{"t":{"$date":"2022-11-16T11:21:05.078+05:30"},"s":"I", "c":"NETWORK", "id":20562, "ctx":"initandlisten","msg":"Shutdown: going to close listening sockets"}
{"t":{"$date":"2022-11-16T11:21:05.079+05:30"},"s":"I", "c":"NETWORK", "id":4784905, "ctx":"initandlisten","msg":"Shutting down the global connection pool"}
{"t":{"$date":"2022-11-16T11:21:05.079+05:30"},"s":"I", "c":"CONTROL", "id":4784906, "ctx":"initandlisten","msg":"Shutting down the FlowControlTicketholder"}
{"t":{"$date":"2022-11-16T11:21:05.079+05:30"},"s":"I", "c":"-", "id":20520, "ctx":"initandlisten","msg":"Stopping further Flow Control ticket acquisitions."}
{"t":{"$date":"2022-11-16T11:21:05.079+05:30"},"s":"I", "c":"NETWORK", "id":4784918, "ctx":"initandlisten","msg":"Shutting down the ReplicaSetMonitor"}
{"t":{"$date":"2022-11-16T11:21:05.080+05:30"},"s":"I", "c":"SHARDING", "id":4784921, "ctx":"initandlisten","msg":"Shutting down the MigrationUtilExecutor"}
{"t":{"$date":"2022-11-16T11:21:05.081+05:30"},"s":"I", "c":"ASIO", "id":22582, "ctx":"MigrationUtil-TaskExecutor","msg":"Killing all outstanding egress activity."}
{"t":{"$date":"2022-11-16T11:21:05.081+05:30"},"s":"I", "c":"COMMAND", "id":4784923, "ctx":"initandlisten","msg":"Shutting down the ServiceEntryPoint"}
{"t":{"$date":"2022-11-16T11:21:05.081+05:30"},"s":"I", "c":"CONTROL", "id":4784925, "ctx":"initandlisten","msg":"Shutting down free monitoring"}

{"t":{"$date":"2022-11-16T11:21:05.081+05:30"},"s":"I", "c":"CONTROL", "id":4784927, "ctx":"initandlisten","msg":"Shutting down the HealthLog"}
{"t":{"$date":"2022-11-16T11:21:05.082+05:30"},"s":"I", "c":"CONTROL", "id":4784928, "ctx":"initandlisten","msg":"Shutting down the TTL monitor"}
{"t":{"$date":"2022-11-16T11:21:05.082+05:30"},"s":"I", "c":"CONTROL", "id":4784929, "ctx":"initandlisten","msg":"Acquiring the global lock for shutdown"}
{"t":{"$date":"2022-11-16T11:21:05.082+05:30"},"s":"I", "c":"-", "id":4784931, "ctx":"initandlisten","msg":"Dropping the scope cache for shutdown"}
{"t":{"$date":"2022-11-16T11:21:05.082+05:30"},"s":"I", "c":"FTDC", "id":4784926, "ctx":"initandlisten","msg":"Shutting down full-time data capture"}
{"t":{"$date":"2022-11-16T11:21:05.083+05:30"},"s":"I", "c":"CONTROL", "id":20565, "ctx":"initandlisten","msg":"Now exiting"}
{"t":{"$date":"2022-11-16T11:21:05.083+05:30"},"s":"I", "c":"CONTROL", "id":23138, "ctx":"initandlisten","msg":"Shutting down","attr":{"exitCode":100}}

C:\Program Files\MongoDB\Server\5.0\bin>mongo.exe
MongoDB shell version v5.0.6
connecting to:
mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("293bdf40-c40d-4db3-82d3-c0e572ce653a") }
MongoDB server version: 5.0.6
==========
Warning: the "mongo" shell has been superseded by "mongosh",
which delivers improved usability and compatibility.The "mongo" shell has been deprecated and will be removed in
an upcoming release.
For installation instructions, see
https://docs.mongodb.com/mongodb-shell/install/
==========
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
    https://docs.mongodb.com/
Questions? Try the MongoDB Developer Community Forums
    https://community.mongodb.com

The server generated these startup warnings when booting:
    2022-11-13T10:22:28.319+05:30: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
---

    Enable MongoDB's free cloud-based monitoring service, which will then receive and display
    metrics about your deployment (disk utilization, CPU, operation statistics, etc).

    The monitoring data will be available on a MongoDB website with a unique URL accessible to you

and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command:
db.disableFreeMonitoring()

> show dbs
admin 0.000GB
config 0.000GB
eshajain_08 0.000GB
local 0.000GB
> db
test

US-TCS-604 – Big Data Analytics
Practical 2 – CRUD Operations on data in MongoDB

1) Display all databases.
test> show dbs
admin 40.00 KiB
cars 176.00 KiB
config 72.00 KiB
letssee 40.00 KiB
local 40.00 KiB
mydb 40.00 KiB

2) Create a new collection 'kcc'.
test> use kcc
switched to db kcc

3) Insert a document with student roll number, name, semester and SGPA.
kcc> db.kcc.insert({rollno:1, sname:'pranav', sem:5, sgpa:9.50})
DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{
acknowledged: true,
insertedIds: { '0': ObjectId("63ccbdfd04ccbffd526d1b74") }
}

4) Display all documents in the collection.
kcc> db.kcc.find()
[
{
_id: ObjectId("63ccbdfd04ccbffd526d1b74"),
rollno: 1,
sname: 'pranav',
sem: 5,

```
    sgpa: 9.5
  }
]
```

5) Insert more documents into the collection.

Using insertOne:

```
kcc> db.kcc.insertOne({rollno:2, sname:'krishi', sem:5, sgpa:9.3})
{
  acknowledged: true,
  insertedId: ObjectId("63ccbe3504ccbffd526d1b75")
}
```

Using insertMany:

```
kcc> db.kcc.insertMany([{rollno:3, sname:'khushi', sem:6, sgpa:8.7}, {rollno:4, sname:'yash',
sem:5, sgpa:7.75}, {rollno:5, sname:'shruti', sem:6, sgpa:9.0}])
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("63ccbeb504ccbffd526d1b76"),
    '1': ObjectId("63ccbeb504ccbffd526d1b77"),
    '2': ObjectId("63ccbeb504ccbffd526d1b78")
  }
}
```

Displaying with beautification:

```
kcc> db.kcc.find().pretty()
[
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 5,
    sgpa: 9.5
  },
  {
    _id: ObjectId("63ccbe3504ccbffd526d1b75"),
    rollno: 2,
    sname: 'krishi',
    sem: 5,
    sgpa: 9.3
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 6,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
```

```
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 6,
    sgpa: 9
  }
]
```

6) Display only the first three documents of the collection.

```
kcc> db.kcc.find().limit(3)
[
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 5,
    sgpa: 9.5
  },
  {
    _id: ObjectId("63ccbe3504ccbffd526d1b75"),
    rollno: 2,
    sname: 'krishi',
    sem: 5,
    sgpa: 9.3
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 6,
    sgpa: 8.7
  }
]
```

7) Display all but the first three documents of the collection.

```
kcc> db.kcc.find().skip(3)
[
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
  },
```

```
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 6,
    sgpa: 9
  }
]
```

8) Display documents 3-5 of the collection.

```
kcc> db.kcc.find().skip(2).limit(3)
[
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 6,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 6,
    sgpa: 9
  }
]
```

9) Display the document having rollno 2.

```
kcc> db.kcc.find({rollno:2})
[
  {
    _id: ObjectId("63ccbe3504ccbffd526d1b75"),
    rollno: 2,
    sname: 'krishi',
    sem: 5,
    sgpa: 9.3
  }
]
```

10) Display document having roll no 4 and sem 5.

```
kcc> db.kcc.find({rollno:4}, {sem:5})
```

```
[ { _id: ObjectId("63ccbeb504ccbffd526d1b77"), sem: 5 } ]
```

11) Update document where rollno is 2 and change sgpa to 9.5.

```
kcc> db.kcc.update({ rollno: 2 }, { $set: { sgpa: 9.5 }})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

12) Update document/s where sgpa is 9.5 and set their grade to ‘A+’.

```
kcc> db.kcc.updateMany({sgpa:9.5}, {$set:{grade:'A+'}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 2,
  modifiedCount: 2,
  upsertedCount: 0
}
kcc> db.kcc.find()
[
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 5,
    sgpa: 9.5,
    grade: 'A+'
  },
  {
    _id: ObjectId("63ccbe3504ccbffd526d1b75"),
    rollno: 2,
    sname: 'krishi',
    sem: 5,
    sgpa: 9.5,
    grade: 'A+'
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 6,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
```

```
    sem: 5,
    sgpa: 7.75
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 6,
    sgpa: 9
  }
]
```

13) Count the number of documents in the collection.

```
kcc> db.kcc.find().count()
(node:67271) [MONGODB DRIVER] Warning: cursor.count is deprecated and will be removed in the next major version, please use `collection.estimatedDocumentCount` or `collection.countDocuments` instead
(Use `node --trace-warnings ...` to show where the warning was created)
5

kcc> db.kcc.countDocuments()
5
```

14) Update documents where SGPA is more than 8 and set their semester to 4.

```
kcc> db.kcc.updateMany({sgpa:{$gt:8}}, {$set:{sem:4}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 4,
  modifiedCount: 4,
  upsertedCount: 0
}

kcc> db.kcc.find()
[
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 4,
    sgpa: 9.5,
    grade: 'A+'
  },
  {
    _id: ObjectId("63ccbe3504ccbffd526d1b75"),
    rollno: 2,
    sname: 'krishi',
    sem: 4,
    sgpa: 9.5,
    grade: 'A+'
  },
```

```
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 4,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 4,
    sgpa: 9
  }
]
```

15) Delete document where rollno is 2.

```
kcc> db.kcc.deleteOne({rollno:2})
{ acknowledged: true, deletedCount: 1 }

kcc> db.kcc.find()
[
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 4,
    sgpa: 9.5,
    grade: 'A+'
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 4,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
```

```
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 4,
    sgpa: 9
  }
]
```

16) Display documents sorted in ascending order of student name.

```
kcc> db.kcc.find().sort({sname:1})
[
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b76"),
    rollno: 3,
    sname: 'khushi',
    sem: 4,
    sgpa: 8.7
  },
  {
    _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
    rollno: 1,
    sname: 'pranav',
    sem: 4,
    sgpa: 9.5,
    grade: 'A+'
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b78"),
    rollno: 5,
    sname: 'shruti',
    sem: 4,
    sgpa: 9
  },
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
    sem: 5,
    sgpa: 7.75
  }
]
```

17) Display documents sorted in descending order of student name.

```
kcc> db.kcc.find().sort({sname:-1})
[
  {
    _id: ObjectId("63ccbeb504ccbffd526d1b77"),
    rollno: 4,
    sname: 'yash',
```

```
  sem: 5,
  sgpa: 7.75
 },
 {
  _id: ObjectId("63ccbeb504ccbffd526d1b78"),
  rollno: 5,
  sname: 'shruti',
  sem: 4,
  sgpa: 9
 },
 {
  _id: ObjectId("63ccbdfd04ccbffd526d1b74"),
  rollno: 1,
  sname: 'pranav',
  sem: 4,
  sgpa: 9.5,
  grade: 'A+'
 },
 {
  _id: ObjectId("63ccbeb504ccbffd526d1b76"),
  rollno: 3,
  sname: 'khushi',
  sem: 4,
  sgpa: 8.7
 }
]
```

US-TCS-604 – Big Data Analytics
Practical 4 – Aggregation Pipeline 1

Create a new database with the name inventory that contains the documents of the following type:
itemname, quantity, size - (height, width, unit of measure), quality (in range A-E), instock - (warehouse, quantity).

```
> use inventory
switched to db inventory

> db.inventory.insertMany([{itemname: "Pen", quantity: 37, size: {height: 10, width:2, unit: "cm"}, quality: 'B', instock: [{warehouse: "w2", quantity: 1}, {warehouse: "w3", quantity: 16}]},
... {itemname: "Marker", quantity: 58, size: {height: 10, width:3.5, unit: "cm"}, quality: 'A', instock: [{warehouse: "w1", quantity: 20}, {warehouse: "w2", quantity: 7}, {warehouse: "w3", quantity: 31}]},
... {itemname: "Notebook", quantity: 350, size: {height: 12, width:0.7, unit: "inch"}, quality: 'C', instock: [{warehouse: "w1", quantity: 170}, {warehouse: "w3", quantity:70}]},
... {itemname: "Ruler", quantity: 123, size: {height: 12, width:0.1, unit: "inch"}, quality: 'E', instock: [{warehouse: "w2", quantity: 46}, {warehouse: "w3", quantity: 54}]},
```

```
... {itemname: "Eraser", quantity: 76, size: {height: 5, width:3.5, unit: "cm"}, quality: 'D',
instock: [{warehouse: "w1", quantity: 40}, {warehouse: "w2", quantity: 36}]},
... {itemname: "Cutter", quantity: 68, size: {height: 8, width:2, unit: "cm"}, quality: 'A',
instock: [{warehouse: "w1", quantity: 21}, {warehouse: "w2", quantity: 26}, {warehouse:
"w3", quantity: 21}]},
... {itemname: "Writing Pad", quantity: 107, size: {height: 15, width:0.1, unit: "inch"},
quality: 'B', instock: [{warehouse: "w1", quantity: 35}, {warehouse: "w2", quantity: 27},
{warehouse: "w3", quantity: 45}]},
... {itemname: "Pencil", quantity: 590, size: {height: 12, width:3.5, unit: "cm"}, quality: 'C',
instock: [{warehouse: "w2", quantity: 210}, {warehouse: "w3", quantity: 100}]},
... {itemname: "Tape", quantity: 360, size: {height: 6, width:1, unit: "cm"}, quality: 'D',
instock: [{warehouse: "w1", quantity: 190}, {warehouse: "w2", quantity: 79}, {warehouse:
"w3", quantity: 91}]},
... {itemname: "Boardpins", quantity: 75, size: {height: 2, width:1.5, unit: "cm"}, quality: 'E',
instock: [{warehouse: "w1", quantity: 14}, {warehouse: "w3", quantity: 54}]}])
{
        "acknowledged" : true,
        "insertedIds" : [
                ObjectId("639add7175bb6a14b0603311"),
                ObjectId("639add7175bb6a14b0603312"),
                ObjectId("639add7175bb6a14b0603313"),
                ObjectId("639add7175bb6a14b0603314"),
                ObjectId("639add7175bb6a14b0603315"),
                ObjectId("639add7175bb6a14b0603316"),
                ObjectId("639add7175bb6a14b0603317"),
                ObjectId("639add7175bb6a14b0603318"),
                ObjectId("639add7175bb6a14b0603319"),
                ObjectId("639add7175bb6a14b060331a")
        ]
}

> db.inventory.find().pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
```

```
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
                "height" : 10,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 20
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 7
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 31
                }
        ]
}
```

(Cont.)

1. Find all inventory item names with quantity less than 100.

```
> db.inventory.find({quantity:{$lt:100}}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
```

```
                "warehouse" : "w3",
                "quantity" : 16
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
            "height" : 10,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 20
            },
            {
                "warehouse" : "w2",
                "quantity" : 7
            },
            {
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
            "height" : 5,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 40
            },
            {
                "warehouse" : "w2",
                "quantity" : 36
            }
        ]
```

```
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
                "height" : 8,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 21
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 26
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 21
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
                "height" : 2,
                "width" : 1.5,
                "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 14
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
```


2. **Find all inventory item names with quality status as A and display their item name and quality only. (Projection)**

```
> db.inventory.find({quality:"A"}, {_id:0, itemname:1, quality:1})
{ "itemname" : "Marker", "quality" : "A" }
{ "itemname" : "Cutter", "quality" : "A" }
```

3. **Find all inventory item names having instock warehouse as w1 and display their instock quantity.**

```
> db.inventory.find({"instock.warehouse":"w1"}, {_id:0, itemname:1, instock:1}).pretty()
{
        "itemname" : "Marker",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 20
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 7
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 31
                }
        ]
}
{
        "itemname" : "Notebook",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 170
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 70
                }
        ]
}
{
        "itemname" : "Eraser",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 40
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 36
                }
```

```
        ]
}
{
        "itemname" : "Cutter",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 21
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 26
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 21
                }
        ]
}
{
        "itemname" : "Writing Pad",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 35
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 27
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 45
                }
        ]
}
{
        "itemname" : "Tape",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 190
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 79
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 91
```

```
            }
        ]
}
{
        "itemname" : "Boardpins",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 14
            },
            {
                "warehouse" : "w3",
                "quantity" : 54
            }
        ]
}
```

4. **Find all inventory item names having quality status as B or E and display their item name and quality status.**

```
> db.inventory.find({$or:[{quality:"B"}, {quality:"E"}]}, {_id:0, itemname:1, quality:1,
}).pretty()
{ "itemname" : "Pen", "quality" : "B" }
{ "itemname" : "Ruler", "quality" : "E" }
{ "itemname" : "Writing Pad", "quality" : "B" }
{ "itemname" : "Boardpins", "quality" : "E" }
```

5. **Find all inventory item names having instock quantity between 20 and 40.**

```
> db.inventory.find({$and:[{quantity:{$gt:20}}, {quantity:{$lt:40}}]}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
            "height" : 10,
            "width" : 2,
            "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
            {
                "warehouse" : "w2",
                "quantity" : 1
            },
            {
                "warehouse" : "w3",
                "quantity" : 16
            }
        ]
}
```

6. **Find all inventory item names starting with ‘P’ display item name and quantity except id.**

```
> db.inventory.find({itemname:{$regex:/^P/}}, {_id:0, itemname:1, quantity:1}).pretty()
{ "itemname" : "Pen", "quantity" : 37 }
{ "itemname" : "Pencil", "quantity" : 590 }
```

7. **Display all inventory item names having instock warehouse as w2 and w3 (itemname, instock warehouse except id).**

```
> db.inventory.find({"instock.warehouse":{$in:["w2", "w3"]}}, {_id:0, itemname:1,
"instock.warehouse":1}).pretty()
{
        "itemname" : "Pen",
        "instock" : [
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Marker",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Notebook",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
```

```
        "itemname" : "Ruler",
        "instock" : [
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Eraser",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w2"
                }
        ]
}
{
        "itemname" : "Cutter",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Writing Pad",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
```

```
        "itemname" : "Pencil",
        "instock" : [
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Tape",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w2"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
{
        "itemname" : "Boardpins",
        "instock" : [
                {
                        "warehouse" : "w1"
                },
                {
                        "warehouse" : "w3"
                }
        ]
}
```

8. **Display all inventory item names not having instock warehouse as w2 and w3 (itemname, instock warehouse except id).**

```
> db.inventory.find({"instock.warehouse":{$nin:["w2", "w3"]}}, {_id:0, itemname:1,
"instock.warehouse":1}).pretty()
> db.inventory.insertOne({itemname:"Crayons", quantity:40, size:{height:4, width:0.1,
unit:"inch"}, quality:"C", instock:[{warehouse:"w1", quantity: 40}]})
{
        "acknowledged" : true,
        "insertedId" : ObjectId("639c1d4cf2a551570c47043e")
}
> db.inventory.find({"instock.warehouse":{$nin:["w2", "w3"]}}, {_id:0, itemname:1,
"instock.warehouse":1}).pretty()
{ "itemname" : "Crayons", "instock" : [ { "warehouse" : "w1" } ] }
```

9. **Display all inventory item names not having quantity greater than equal to 50.**

```
> db.inventory.find({quantity:{$not:{$gte:50}}}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
                }
        ]
}
{
        "_id" : ObjectId("639c1d4cf2a551570c47043e"),
        "itemname" : "Crayons",
        "quantity" : 40,
        "size" : {
                "height" : 4,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "C",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 40
                }
        ]
}
```

10. **Find all inventory item names having quality status as E and quantity greater than 100.**

```
> db.inventory.find({$and:[{quality:"E"}, {quantity:{$gte:100}}]}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
```

```
        "quantity" : 123,
        "size" : {
                "height" : 12,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 46
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
```

11. **Find the count of inventory items names having size in cm.**

```
> db.inventory.find({"size.unit":"cm"}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
                "height" : 10,
                "width" : 3.5,
```

```
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 20
            },
            {
                "warehouse" : "w2",
                "quantity" : 7
            },
            {
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
            "height" : 5,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 40
            },
            {
                "warehouse" : "w2",
                "quantity" : 36
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
            "height" : 8,
            "width" : 2,
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
```

```
            {
                "warehouse" : "w1",
                "quantity" : 21
            },
            {
                "warehouse" : "w2",
                "quantity" : 26
            },
            {
                "warehouse" : "w3",
                "quantity" : 21
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590,
        "size" : {
            "height" : 12,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "C",
        "instock" : [
            {
                "warehouse" : "w2",
                "quantity" : 210
            },
            {
                "warehouse" : "w3",
                "quantity" : 100
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
            "height" : 6,
            "width" : 1,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 190
            },
```

```
                {
                        "warehouse" : "w2",
                        "quantity" : 79
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 91
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
                "height" : 2,
                "width" : 1.5,
                "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 14
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
> db.inventory.count({"size.unit":"cm"})
7
```

12. **Display first three documents from inventory database.**

```
> db.inventory.find().limit(3).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
```

```
                "quantity" : 1
            },
            {
                "warehouse" : "w3",
                "quantity" : 16
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
            "height" : 10,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 20
            },
            {
                "warehouse" : "w2",
                "quantity" : 7
            },
            {
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "quantity" : 350,
        "size" : {
            "height" : 12,
            "width" : 0.7,
            "unit" : "inch"
        },
        "quality" : "C",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 170
            },
            {
                "warehouse" : "w3",
```

```
                "quantity" : 70
            }
        ]
}
```

Aggregation functions:

13. **Display the total quantity of all items.**

```
> db.inventory.aggregate({$group:{_id:null, "Total quantity:":{$sum:"$quantity"}}})
{ "_id" : null, "Total quantity:" : 1884 }
```

14. **Display the average quantity of items present in each document within the collection.**

```
> db.inventory.aggregate({$group:{_id:null, "Average quantity:":{$avg:"$quantity"}}})
{ "_id" : null, "Average quantity:" : 171.27272727272728 }
```

15. **Display which item has the lowest quantity within the collection.**

```
> db.inventory.aggregate({$group:{_id:null, "Item with lowest
quantity:":{$min:"$quantity"}}})
{ "_id" : null, "Item with lowest quantity:" : 37 }
```

16. **Display which item has the highest quantity within the collection.**

```
> db.inventory.aggregate({$group:{_id:null, "Item with highest
quantity:":{$max:"$quantity"}}})
{ "_id" : null, "Item with highest quantity:" : 590 }
```

17. Find all items having quantity greater than or equal to 50.

```
> db.inventory.find({quantity:{$gte:50}}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
                "height" : 10,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 20
                },
                {
```

```
                "warehouse" : "w2",
                "quantity" : 7
            },
            {
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "quantity" : 350,
        "size" : {
            "height" : 12,
            "width" : 0.7,
            "unit" : "inch"
        },
        "quality" : "C",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 170
            },
            {
                "warehouse" : "w3",
                "quantity" : 70
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
        "quantity" : 123,
        "size" : {
            "height" : 12,
            "width" : 0.1,
            "unit" : "inch"
        },
        "quality" : "E",
        "instock" : [
            {
                "warehouse" : "w2",
                "quantity" : 46
            },
            {
                "warehouse" : "w3",
                "quantity" : 54
            }
        ]
```

```
}
{
	"_id" : ObjectId("639add7175bb6a14b0603315"),
	"itemname" : "Eraser",
	"quantity" : 76,
	"size" : {
		"height" : 5,
		"width" : 3.5,
		"unit" : "cm"
	},
	"quality" : "D",
	"instock" : [
		{
			"warehouse" : "w1",
			"quantity" : 40
		},
		{
			"warehouse" : "w2",
			"quantity" : 36
		}
	]
}
{
	"_id" : ObjectId("639add7175bb6a14b0603316"),
	"itemname" : "Cutter",
	"quantity" : 68,
	"size" : {
		"height" : 8,
		"width" : 2,
		"unit" : "cm"
	},
	"quality" : "A",
	"instock" : [
		{
			"warehouse" : "w1",
			"quantity" : 21
		},
		{
			"warehouse" : "w2",
			"quantity" : 26
		},
		{
			"warehouse" : "w3",
			"quantity" : 21
		}
	]
}
{
	"_id" : ObjectId("639add7175bb6a14b0603317"),
	"itemname" : "Writing Pad",
```

```
        "quantity" : 107,
        "size" : {
                "height" : 15,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 35
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 27
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 45
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590,
        "size" : {
                "height" : 12,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "C",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 210
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 100
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
                "height" : 6,
                "width" : 1,
```

```
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 190
            },
            {
                "warehouse" : "w2",
                "quantity" : 79
            },
            {
                "warehouse" : "w3",
                "quantity" : 91
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
            "height" : 2,
            "width" : 1.5,
            "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 14
            },
            {
                "warehouse" : "w3",
                "quantity" : 54
            }
        ]
}
> db.inventory.find({quantity:{$gte:50}}, {_id:0, itemname:1, quantity:1}).pretty()
{ "itemname" : "Marker", "quantity" : 58 }
{ "itemname" : "Notebook", "quantity" : 350 }
{ "itemname" : "Ruler", "quantity" : 123 }
{ "itemname" : "Eraser", "quantity" : 76 }
{ "itemname" : "Cutter", "quantity" : 68 }
{ "itemname" : "Writing Pad", "quantity" : 107 }
{ "itemname" : "Pencil", "quantity" : 590 }
{ "itemname" : "Tape", "quantity" : 360 }
{ "itemname" : "Boardpins", "quantity" : 75 }
```

```
> db.inventory.aggregate([{$match:{quantity:{$gte:50}}}]).pretty()
{
	"_id" : ObjectId("639add7175bb6a14b0603312"),
	"itemname" : "Marker",
	"quantity" : 58,
	"size" : {
		"height" : 10,
		"width" : 3.5,
		"unit" : "cm"
	},
	"quality" : "A",
	"instock" : [
		{
			"warehouse" : "w1",
			"quantity" : 20
		},
		{
			"warehouse" : "w2",
			"quantity" : 7
		},
		{
			"warehouse" : "w3",
			"quantity" : 31
		}
	]
}
{
	"_id" : ObjectId("639add7175bb6a14b0603313"),
	"itemname" : "Notebook",
	"quantity" : 350,
	"size" : {
		"height" : 12,
		"width" : 0.7,
		"unit" : "inch"
	},
	"quality" : "C",
	"instock" : [
		{
			"warehouse" : "w1",
			"quantity" : 170
		},
		{
			"warehouse" : "w3",
			"quantity" : 70
		}
	]
}
{
	"_id" : ObjectId("639add7175bb6a14b0603314"),
	"itemname" : "Ruler",
```

```
        "quantity" : 123,
        "size" : {
                "height" : 12,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 46
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
                "height" : 5,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 40
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 36
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
                "height" : 8,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
```

```
            {
                "warehouse" : "w1",
                "quantity" : 21
            },
            {
                "warehouse" : "w2",
                "quantity" : 26
            },
            {
                "warehouse" : "w3",
                "quantity" : 21
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603317"),
        "itemname" : "Writing Pad",
        "quantity" : 107,
        "size" : {
            "height" : 15,
            "width" : 0.1,
            "unit" : "inch"
        },
        "quality" : "B",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 35
            },
            {
                "warehouse" : "w2",
                "quantity" : 27
            },
            {
                "warehouse" : "w3",
                "quantity" : 45
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590,
        "size" : {
            "height" : 12,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "C",
        "instock" : [
```

```
            {
                "warehouse" : "w2",
                "quantity" : 210
            },
            {
                "warehouse" : "w3",
                "quantity" : 100
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
            "height" : 6,
            "width" : 1,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 190
            },
            {
                "warehouse" : "w2",
                "quantity" : 79
            },
            {
                "warehouse" : "w3",
                "quantity" : 91
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
            "height" : 2,
            "width" : 1.5,
            "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 14
            },
```

```
            {
                "warehouse" : "w3",
                "quantity" : 54
            }
        ]
}
```

18. **Display all item names having unit of measure as cm.**

```
> db.inventory.aggregate([{$match:{"size.unit":"cm"}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
                "height" : 10,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 20
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 7
                },
```

```
            {
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
            "height" : 5,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 40
            },
            {
                "warehouse" : "w2",
                "quantity" : 36
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
            "height" : 8,
            "width" : 2,
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 21
            },
            {
                "warehouse" : "w2",
                "quantity" : 26
            },
            {
                "warehouse" : "w3",
                "quantity" : 21
            }
```

```
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590,
        "size" : {
                "height" : 12,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "C",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 210
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 100
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
                "height" : 6,
                "width" : 1,
                "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 190
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 79
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 91
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
```

```
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
                "height" : 2,
                "width" : 1.5,
                "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 14
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
```

19. Display only itemname and unit of items having unit as cm.

```
> db.inventory.aggregate([{$match:{"size.unit":"cm"}}, {$project:{itemname:1,
"size.unit":"cm"}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "size" : {
                "unit" : "cm"
        }
```

```
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "size" : {
                "unit" : "cm"
        }
}
```

20**. Display entire documents using aggregate.**

```
> db.inventory.aggregate([{$match:{}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
```

```
        "quantity" : 58,
        "size" : {
                "height" : 10,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 20
                },
                {
                        "warehouse" : "w2",
                        "quantity" : 7
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 31
                }
        ]
}
```

(Cont.)

21. **Display all inventory items having item names as pen, pencil, marker and display their item name, quantity and unit of measure.**

```
> db.inventory.aggregate([{$match:{itemname:{$in:["Pen", "Pencil", "Marker"]}}},
{$project:{itemname:1, quantity:1, "size.unit":1}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590,
        "size" : {
```

```
            "unit" : "cm"
        }
}
```

22. **Display all inventory items not having item names as pen, pencil, marker and display their item name, quantity and unit of measure.**

```
> db.inventory.aggregate([{$match:{itemname:{$nin:["Pen", "Pencil", "Marker"]}}},
{$project:{itemname:1, quantity:1, "size.unit":1}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "quantity" : 350,
        "size" : {
                "unit" : "inch"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
        "quantity" : 123,
        "size" : {
                "unit" : "inch"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b0603317"),
        "itemname" : "Writing Pad",
        "quantity" : 107,
        "size" : {
                "unit" : "inch"
        }
}
{
```

```
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
        "size" : {
                "unit" : "cm"
        }
}
{
        "_id" : ObjectId("639c1d4cf2a551570c47043e"),
        "itemname" : "Crayons",
        "quantity" : 40,
        "size" : {
                "unit" : "inch"
        }
}
```

23. **Display all inventory items having instock quantity between 50 and 100 and display their item name, unit of measure and instock quantity.**

```
> db.inventory.aggregate([{$match:{$and:[{"instock.quantity":{$gte:50}},
{"instock.quantity":{$lt:100}}]}}, {$project:{itemname:1, "instock.quantity":1,
"size.unit":1}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "size" : {
                "unit" : "inch"
        },
        "instock" : [
                {
                        "quantity" : 170
                },
                {
                        "quantity" : 70
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
        "size" : {
                "unit" : "inch"
```

```
        },
        "instock" : [
                {
                        "quantity" : 46
                },
                {
                        "quantity" : 54
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "size" : {
                "unit" : "cm"
        },
        "instock" : [
                {
                        "quantity" : 190
                },
                {
                        "quantity" : 79
                },
                {
                        "quantity" : 91
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "size" : {
                "unit" : "cm"
        },
        "instock" : [
                {
                        "quantity" : 14
                },
                {
                        "quantity" : 54
                }
        ]
}
```

24. **Display all inventory items sorted on the basis of item names.**

```
> db.inventory.aggregate([{$match:{}}, {$sort:{itemname:1}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75,
```

```
        "size" : {
                "height" : 2,
                "width" : 1.5,
                "unit" : "cm"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 14
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
{
        "_id" : ObjectId("639c1d4cf2a551570c47043e"),
        "itemname" : "Crayons",
        "quantity" : 40,
        "size" : {
                "height" : 4,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "C",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 40
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603316"),
        "itemname" : "Cutter",
        "quantity" : 68,
        "size" : {
                "height" : 8,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
                {
                        "warehouse" : "w1",
                        "quantity" : 21
                },
                {
```

```
                "warehouse" : "w2",
                "quantity" : 26
            },
            {
                "warehouse" : "w3",
                "quantity" : 21
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76,
        "size" : {
            "height" : 5,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 40
            },
            {
                "warehouse" : "w2",
                "quantity" : 36
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603312"),
        "itemname" : "Marker",
        "quantity" : 58,
        "size" : {
            "height" : 10,
            "width" : 3.5,
            "unit" : "cm"
        },
        "quality" : "A",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 20
            },
            {
                "warehouse" : "w2",
                "quantity" : 7
            },
            {
```

```
                "warehouse" : "w3",
                "quantity" : 31
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "quantity" : 350,
        "size" : {
            "height" : 12,
            "width" : 0.7,
            "unit" : "inch"
        },
        "quality" : "C",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 170
            },
            {
                "warehouse" : "w3",
                "quantity" : 70
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
            "height" : 10,
            "width" : 2,
            "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
            {
                "warehouse" : "w2",
                "quantity" : 1
            },
            {
                "warehouse" : "w3",
                "quantity" : 16
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
```

```
        "quantity" : 590,
        "size" : {
                "height" : 12,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "C",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 210
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 100
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
        "quantity" : 123,
        "size" : {
                "height" : 12,
                "width" : 0.1,
                "unit" : "inch"
        },
        "quality" : "E",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 46
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 54
                }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360,
        "size" : {
                "height" : 6,
                "width" : 1,
                "unit" : "cm"
        },
        "quality" : "D",
        "instock" : [
```

```
            {
                "warehouse" : "w1",
                "quantity" : 190
            },
            {
                "warehouse" : "w2",
                "quantity" : 79
            },
            {
                "warehouse" : "w3",
                "quantity" : 91
            }
        ]
}
{
        "_id" : ObjectId("639add7175bb6a14b0603317"),
        "itemname" : "Writing Pad",
        "quantity" : 107,
        "size" : {
            "height" : 15,
            "width" : 0.1,
            "unit" : "inch"
        },
        "quality" : "B",
        "instock" : [
            {
                "warehouse" : "w1",
                "quantity" : 35
            },
            {
                "warehouse" : "w2",
                "quantity" : 27
            },
            {
                "warehouse" : "w3",
                "quantity" : 45
            }
        ]
}
```

25. **Display all inventory items having quantity greater than equal to 70, sorted by their quantity in descending order and display their item names and quantity.**

```
> db.inventory.aggregate([{$match:{quantity:{$gte:70}}}, {$sort:{quantity:-1}},
{$project:{itemname:1, quantity:1}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603318"),
        "itemname" : "Pencil",
        "quantity" : 590
}
```

```
{
        "_id" : ObjectId("639add7175bb6a14b0603319"),
        "itemname" : "Tape",
        "quantity" : 360
}
{
        "_id" : ObjectId("639add7175bb6a14b0603313"),
        "itemname" : "Notebook",
        "quantity" : 350
}
{
        "_id" : ObjectId("639add7175bb6a14b0603314"),
        "itemname" : "Ruler",
        "quantity" : 123
}
{
        "_id" : ObjectId("639add7175bb6a14b0603317"),
        "itemname" : "Writing Pad",
        "quantity" : 107
}
{
        "_id" : ObjectId("639add7175bb6a14b0603315"),
        "itemname" : "Eraser",
        "quantity" : 76
}
{
        "_id" : ObjectId("639add7175bb6a14b060331a"),
        "itemname" : "Boardpins",
        "quantity" : 75
}
```

Insert records with same item names.

```
db.inventory.insertMany([{itemname: "Pen", quantity: 50, size: {height: 10, width:2, unit:
"cm"}, quality: 'B', instock: [{warehouse: "w3", quantity: 50}]},
{itemname: "Marker", quantity: 77, size: {height: 10, width:3.5, unit: "cm"}, quality: 'D',
instock: [{warehouse: "w2", quantity: 7}, {warehouse: "w3", quantity: 70}]},
{itemname: "Pencil", quantity: 90, size: {height: 12, width:3.5, unit: "cm"}, quality: 'C',
instock: [{warehouse: "w1", quantity: 90}]},
{itemname: "Marker", quantity: 17, size: {height: 10, width:3.5, unit: "cm"}, quality: 'A',
instock: [{warehouse: "w1", quantity: 7}, {warehouse: "w3", quantity: 10}]},
{itemname: "Pen", quantity: 80, size: {height: 12, width:3.5, unit: "cm"}, quality: 'B', instock:
[{warehouse: "w3", quantity: 80}]}])
```

```
{
      "acknowledged" : true,
      "insertedIds" : [
            ObjectId("63a01738e43a2a84974a4bd0"),
            ObjectId("63a01738e43a2a84974a4bd1"),
            ObjectId("63a01738e43a2a84974a4bd2"),
```

```
            ObjectId("63a01738e43a2a84974a4bd3"),
            ObjectId("63a01738e43a2a84974a4bd4")
        ]
}
```

26. **Display all item names having name Pen.**

```
> db.inventory.aggregate([{$match:{itemname:"Pen"}}]).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w2",
                        "quantity" : 1
                },
                {
                        "warehouse" : "w3",
                        "quantity" : 16
                }
        ]
}
{
        "_id" : ObjectId("63a01738e43a2a84974a4bd0"),
        "itemname" : "Pen",
        "quantity" : 50,
        "size" : {
                "height" : 10,
                "width" : 2,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w3",
                        "quantity" : 50
                }
        ]
}
{
        "_id" : ObjectId("63a01738e43a2a84974a4bd4"),
        "itemname" : "Pen",
        "quantity" : 80,
```

```
        "size" : {
                "height" : 12,
                "width" : 3.5,
                "unit" : "cm"
        },
        "quality" : "B",
        "instock" : [
                {
                        "warehouse" : "w3",
                        "quantity" : 80
                }
        ]
}
```

Group:

```
> db.inventory.aggregate([{$group:{_id:"$itemname"}}])
{ "_id" : "Notebook" }
{ "_id" : "Eraser" }
{ "_id" : "Tape" }
{ "_id" : "Marker" }
{ "_id" : "Ruler" }
{ "_id" : "Boardpins" }
{ "_id" : "Cutter" }
{ "_id" : "Crayons" }
{ "_id" : "Pencil" }
{ "_id" : "Pen" }
{ "_id" : "Writing Pad" }
```

27. Display all inventory items grouped by item name.

```
> db.inventory.aggregate([{$group:{_id:{itemname:"$itemname"}}}])
{ "_id" : { "itemname" : "Writing Pad" } }
{ "_id" : { "itemname" : "Eraser" } }
{ "_id" : { "itemname" : "Notebook" } }
{ "_id" : { "itemname" : "Boardpins" } }
{ "_id" : { "itemname" : "Pencil" } }
{ "_id" : { "itemname" : "Pen" } }
{ "_id" : { "itemname" : "Cutter" } }
{ "_id" : { "itemname" : "Crayons" } }
{ "_id" : { "itemname" : "Tape" } }
{ "_id" : { "itemname" : "Marker" } }
{ "_id" : { "itemname" : "Ruler" } }

> db.inventory.aggregate([{$group:{_id:{itemname:"$itemname",
quantity:"$quantity"}}}])
{ "_id" : { "itemname" : "Eraser", "quantity" : 76 } }
{ "_id" : { "itemname" : "Cutter", "quantity" : 68 } }
{ "_id" : { "itemname" : "Marker", "quantity" : 58 } }
```

```
{ "_id" : { "itemname" : "Crayons", "quantity" : 40 } }
{ "_id" : { "itemname" : "Pen", "quantity" : 80 } }
{ "_id" : { "itemname" : "Marker", "quantity" : 17 } }
{ "_id" : { "itemname" : "Boardpins", "quantity" : 75 } }
{ "_id" : { "itemname" : "Marker", "quantity" : 77 } }
{ "_id" : { "itemname" : "Pen", "quantity" : 50 } }
{ "_id" : { "itemname" : "Pencil", "quantity" : 590 } }
{ "_id" : { "itemname" : "Tape", "quantity" : 360 } }
{ "_id" : { "itemname" : "Notebook", "quantity" : 350 } }
{ "_id" : { "itemname" : "Writing Pad", "quantity" : 107 } }
{ "_id" : { "itemname" : "Pencil", "quantity" : 90 } }
{ "_id" : { "itemname" : "Pen", "quantity" : 37 } }
{ "_id" : { "itemname" : "Ruler", "quantity" : 123 } }
```

28. **Count the number of inventory items grouped by item name.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:1}}}])
{ "_id" : "Cutter", "Total number of items are: " : 1 }
{ "_id" : "Marker", "Total number of items are: " : 3 }
{ "_id" : "Eraser", "Total number of items are: " : 1 }
{ "_id" : "Pen", "Total number of items are: " : 3 }
{ "_id" : "Tape", "Total number of items are: " : 1 }
{ "_id" : "Crayons", "Total number of items are: " : 1 }
{ "_id" : "Boardpins", "Total number of items are: " : 1 }
{ "_id" : "Notebook", "Total number of items are: " : 1 }
{ "_id" : "Pencil", "Total number of items are: " : 2 }
{ "_id" : "Ruler", "Total number of items are: " : 1 }
{ "_id" : "Writing Pad", "Total number of items are: " : 1 }
```

29. **Count the number of inventory items grouped by item name and sort them on item names in ascending order.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:1}}}, {$sort:{_id:1}}])
{ "_id" : "Boardpins", "Total number of items are: " : 1 }
{ "_id" : "Crayons", "Total number of items are: " : 1 }
{ "_id" : "Cutter", "Total number of items are: " : 1 }
{ "_id" : "Eraser", "Total number of items are: " : 1 }
{ "_id" : "Marker", "Total number of items are: " : 3 }
{ "_id" : "Notebook", "Total number of items are: " : 1 }
{ "_id" : "Pen", "Total number of items are: " : 3 }
{ "_id" : "Pencil", "Total number of items are: " : 2 }
{ "_id" : "Ruler", "Total number of items are: " : 1 }
{ "_id" : "Tape", "Total number of items are: " : 1 }
{ "_id" : "Writing Pad", "Total number of items are: " : 1 }
```

30. **Count the number of inventory items grouped by item name and sort them on item names in descending order.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:1}}}, {$sort:{_id:-1}}])
{ "_id" : "Writing Pad", "Total number of items are: " : 1 }
{ "_id" : "Tape", "Total number of items are: " : 1 }
{ "_id" : "Ruler", "Total number of items are: " : 1 }
{ "_id" : "Pencil", "Total number of items are: " : 2 }
{ "_id" : "Pen", "Total number of items are: " : 3 }
{ "_id" : "Notebook", "Total number of items are: " : 1 }
{ "_id" : "Marker", "Total number of items are: " : 3 }
{ "_id" : "Eraser", "Total number of items are: " : 1 }
{ "_id" : "Cutter", "Total number of items are: " : 1 }
{ "_id" : "Crayons", "Total number of items are: " : 1 }
{ "_id" : "Boardpins", "Total number of items are: " : 1 }
```

31. **Display the total quantity of all items grouped by itemnames and sort them in ascending order by item name.**

```
> db.inventory.find({itemname:"Pen"}, {itemname:1, quantity:1}).pretty()
{
        "_id" : ObjectId("639add7175bb6a14b0603311"),
        "itemname" : "Pen",
        "quantity" : 37
}
{
        "_id" : ObjectId("63a01738e43a2a84974a4bd0"),
        "itemname" : "Pen",
        "quantity" : 50
}
{
        "_id" : ObjectId("63a01738e43a2a84974a4bd4"),
        "itemname" : "Pen",
        "quantity" : 80
}
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:"$quantity"}}}, {$sort:{_id:1}}])
{ "_id" : "Boardpins", "Total number of items are: " : 75 }
{ "_id" : "Crayons", "Total number of items are: " : 40 }
{ "_id" : "Cutter", "Total number of items are: " : 68 }
{ "_id" : "Eraser", "Total number of items are: " : 76 }
{ "_id" : "Marker", "Total number of items are: " : 152 }
{ "_id" : "Notebook", "Total number of items are: " : 350 }
{ "_id" : "Pen", "Total number of items are: " : 167 }
{ "_id" : "Pencil", "Total number of items are: " : 680 }
{ "_id" : "Ruler", "Total number of items are: " : 123 }
{ "_id" : "Tape", "Total number of items are: " : 360 }
{ "_id" : "Writing Pad", "Total number of items are: " : 107 }
```

32. **Display the total quantity of all items grouped by itemnames and sort them in ascending order by item name, having quantity greater than equal to 100.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:"$quantity"}}}, {$sort:{_id:1}}, {$match:{"Total number of items are:
":{$gte:100}}}])
{ "_id" : "Marker", "Total number of items are: " : 152 }
{ "_id" : "Notebook", "Total number of items are: " : 350 }
{ "_id" : "Pen", "Total number of items are: " : 167 }
{ "_id" : "Pencil", "Total number of items are: " : 680 }
{ "_id" : "Ruler", "Total number of items are: " : 123 }
{ "_id" : "Tape", "Total number of items are: " : 360 }
{ "_id" : "Writing Pad", "Total number of items are: " : 107 }
```

33. **Display all inventory item names along with their quantity.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:"$quantity"}}}, {$project:{itemname:1, "Total number of items are: ":1}},
{$sort:{_id:1}}])
{ "_id" : "Boardpins", "Total number of items are: " : 75 }
{ "_id" : "Crayons", "Total number of items are: " : 40 }
{ "_id" : "Cutter", "Total number of items are: " : 68 }
{ "_id" : "Eraser", "Total number of items are: " : 76 }
{ "_id" : "Marker", "Total number of items are: " : 152 }
{ "_id" : "Notebook", "Total number of items are: " : 350 }
{ "_id" : "Pen", "Total number of items are: " : 167 }
{ "_id" : "Pencil", "Total number of items are: " : 680 }
{ "_id" : "Ruler", "Total number of items are: " : 123 }
{ "_id" : "Tape", "Total number of items are: " : 360 }
{ "_id" : "Writing Pad", "Total number of items are: " : 107 }
```

34. **Display all inventory item names along with their quantity, having quantity greater than equal to 50.**

```
> db.inventory.aggregate([{$group:{_id:"$itemname", "Total number of items are:
":{$sum:"$quantity"}}}, {$match:{"Total number of items are: ":{$gte:100}}},
{$project:{itemname:1, "Total number of items are: ":1}}, {$sort:{_id:1}}])
{ "_id" : "Marker", "Total number of items are: " : 152 }
{ "_id" : "Notebook", "Total number of items are: " : 350 }
{ "_id" : "Pen", "Total number of items are: " : 167 }
{ "_id" : "Pencil", "Total number of items are: " : 680 }
{ "_id" : "Ruler", "Total number of items are: " : 123 }
{ "_id" : "Tape", "Total number of items are: " : 360 }
{ "_id" : "Writing Pad", "Total number of items are: " : 107 }
```

US-TCS-604 – Big Data Analytics
Practical 5 – Aggregation Pipeline 2

Create a collection ‘cars’, as follows:

>db.cars.insertMany([{"Manufacturer":"Fiat","Colour":"Black","Model":"Panda","Milage":33292.0,"Price":2668.32,"Classification":"Motor Cars","Extras":["SatNav","ABS"]},
...
{"Manufacturer":"VW","Colour":"Blue","Model":"Polo","Milage":79712.0,"Price":7311.52,"Classification":"Motor Cars","Extras":["ABS"]},
...
{"Manufacturer":"VW","Colour":"Blue","Model":"Passat","Milage":75294.0,"Price":7488.24,"Classification":"Motor Cars","Extras":["Aircon"]},
...
{"Manufacturer":"Fiat","Colour":"Black","Model":"Punto","Milage":30380.0,"Price":2784.8,"Classification":"Motor Cars","Extras":["PAS","Power Windows"]},
...
{"Manufacturer":"Fiat","Colour":"White","Model":"Panda","Milage":32229.0,"Price":2710.84,"Classification":"Motor Cars","Extras":["ABS","Power Windows"]},
...
{"Manufacturer":"Skoda","Colour":"Blue","Model":"Octavia","Milage":42901.0,"Price":6283.96,"Classification":"Motor Cars","Extras":["Power Windows","Auto Wipers","Aircon"]},
...
{"Manufacturer":"Skoda","Colour":"Red","Model":"Fabia","Milage":82061.0,"Price":4717.56,"Classification":"Motor Cars","Extras":["Parking Sensors","SatNav"]},
...
{"Manufacturer":"Fiat","Colour":"Black","Model":"Uno","Milage":29978.0,"Price":2800.88,"Classification":"Motor Cars","Extras":["Aircon","Parking Sensors","PAS"]},
...
{"Manufacturer":"Skoda","Colour":"Blue","Model":"Superb","Milage":48056.0,"Price":6077.76,"Classification":"Motor Cars","Extras":["ESP","PAS","SatNav"]},
...
{"Manufacturer":"Fiat","Colour":"White","Model":"Panda","Milage":31620.0,"Price":2735.2,"Classification":"Motor Cars","Extras":["SatNav","Aircon"]},
...
{"Manufacturer":"Fiat","Colour":"White","Model":"Uno","Milage":28875.0,"Price":2845.0,"Classification":"Motor Cars","Extras":["ABS","Parking Sensors"]},
...
{"Manufacturer":"VW","Colour":"Blue","Model":"Polo","Milage":60604.0,"Price":8075.84,"Classification":"Motor Cars","Extras":["PAS","Auto Wipers","Power Windows"]},
...
{"Manufacturer":"Fiat","Colour":"Red","Model":"Panda","Milage":31477.0,"Price":2740.92,"Classification":"Motor Cars","Extras":["Parking Sensors","SatNav"]},
...
{"Manufacturer":"VW","Colour":"Red","Model":"Polo","Milage":82795.0,"Price":7188.2,"Classification":"Motor Cars","Extras":["ABS"]},
...
{"Manufacturer":"Fiat","Colour":"Blue","Model":"Punto","Milage":29553.0,"Price":2817.88,"Classification":"Motor Cars","Extras":["Aircon","Auto Wipers"]},
...
{"Manufacturer":"Skoda","Colour":"Green","Model":"Octavia","Milage":55428.0,"Price":5782.88,"Classification":"Motor Cars","Extras":["Parking Sensors"]},
...
{"Manufacturer":"Fiat","Colour":"White","Model":"Panda","Milage":31274.0,"Price":2749.04,"Classification":"Motor Cars","Extras":["Power Windows","Parking Sensors"]},

...
{"Manufacturer":"Fiat","Colour":"Green","Model":"Panda","Milage":31125.0,"Price":2755.0
,"Classification":"Motor Cars","Extras":["Auto Wipers"]},
...
{"Manufacturer":"VW","Colour":"Blue","Model":"Polo","Milage":58557.0,"Price":8157.72,
"Classification":"Motor Cars","Extras":["PAS","ESP"]},
...
{"Manufacturer":"Skoda","Colour":"White","Model":"Fabia","Milage":53574.0,"Price":5857
.04,"Classification":"Motor Cars","Extras":["SatNav"]},
...
{"Manufacturer":"VW","Colour":"Red","Model":"Polo","Milage":61193.0,"Price":8052.28,"
Classification":"Motor Cars","Extras":["Power Windows"]}]
...)

```
{
        "acknowledged" : true,
        "insertedIds" : [
                ObjectId("63a41361a73fb34b15d891e2"),
                ObjectId("63a41361a73fb34b15d891e3"),
                ObjectId("63a41361a73fb34b15d891e4"),
                ObjectId("63a41361a73fb34b15d891e5"),
                ObjectId("63a41361a73fb34b15d891e6"),
                ObjectId("63a41361a73fb34b15d891e7"),
                ObjectId("63a41361a73fb34b15d891e8"),
                ObjectId("63a41361a73fb34b15d891e9"),
                ObjectId("63a41361a73fb34b15d891ea"),
                ObjectId("63a41361a73fb34b15d891eb"),
                ObjectId("63a41361a73fb34b15d891ec"),
                ObjectId("63a41361a73fb34b15d891ed"),
                ObjectId("63a41361a73fb34b15d891ee"),
                ObjectId("63a41361a73fb34b15d891ef"),
                ObjectId("63a41361a73fb34b15d891f0"),
                ObjectId("63a41361a73fb34b15d891f1"),
                ObjectId("63a41361a73fb34b15d891f2"),
                ObjectId("63a41361a73fb34b15d891f3"),
                ObjectId("63a41361a73fb34b15d891f4"),
                ObjectId("63a41361a73fb34b15d891f5"),
                ObjectId("63a41361a73fb34b15d891f6")
        ]
}
```

Perform the following mongodb quesries on the above data:-

1. Display all documents.

```
> db.cars.find().pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891e2"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Panda",
        "Milage" : 33292,
```

```
        "Price" : 2668.32,
        "Classification" : "Motor Cars",
        "Extras" : [
                "SatNav",
                "ABS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e3"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 79712,
        "Price" : 7311.52,
        "Classification" : "Motor Cars",
        "Extras" : [
                "ABS"
        ]
}
```

(Cont.)

2. Display cars having "Manufacturer" as "Fiat".

```
> db.cars.find({Manufacturer:"Fiat"}).pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891e2"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Panda",
        "Milage" : 33292,
        "Price" : 2668.32,
        "Classification" : "Motor Cars",
        "Extras" : [
                "SatNav",
                "ABS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e5"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Punto",
        "Milage" : 30380,
        "Price" : 2784.8,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "Power Windows"
        ]
```

```
}
```

(Cont.)

3. Display cars having "Extras" as "PAS".

```
> db.cars.find({Extras:"PAS"}).pretty()
{
	"_id" : ObjectId("63a41361a73fb34b15d891e5"),
	"Manufacturer" : "Fiat",
	"Colour" : "Black",
	"Model" : "Punto",
	"Milage" : 30380,
	"Price" : 2784.8,
	"Classification" : "Motor Cars",
	"Extras" : [
		"PAS",
		"Power Windows"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e9"),
	"Manufacturer" : "Fiat",
	"Colour" : "Black",
	"Model" : "Uno",
	"Milage" : 29978,
	"Price" : 2800.88,
	"Classification" : "Motor Cars",
	"Extras" : [
		"Aircon",
		"Parking Sensors",
		"PAS"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891ea"),
	"Manufacturer" : "Skoda",
	"Colour" : "Blue",
	"Model" : "Superb",
	"Milage" : 48056,
	"Price" : 6077.76,
	"Classification" : "Motor Cars",
	"Extras" : [
		"ESP",
		"PAS",
		"SatNav"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891ed"),
```

```
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 60604,
        "Price" : 8075.84,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "Auto Wipers",
                "Power Windows"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891f4"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 58557,
        "Price" : 8157.72,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "ESP"
        ]
}
```

4. Display cars having price greater than 5000.

```
> db.cars.find({Price:{$gt:5000}}).pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891e3"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 79712,
        "Price" : 7311.52,
        "Classification" : "Motor Cars",
        "Extras" : [
                "ABS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e4"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Passat",
        "Milage" : 75294,
        "Price" : 7488.24,
        "Classification" : "Motor Cars",
        "Extras" : [
```

```
            "Aircon"
        ]
}
```

(Cont.)

5. Dipslay cars having "Milage" between 50000 and 60000.

```
> db.cars.find({$and:[{Milage:{$gte:50000}}, {Milage:{$lte:60000}}]}).pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891f1"),
        "Manufacturer" : "Skoda",
        "Colour" : "Green",
        "Model" : "Octavia",
        "Milage" : 55428,
        "Price" : 5782.88,
        "Classification" : "Motor Cars",
        "Extras" : [
                "Parking Sensors"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891f4"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 58557,
        "Price" : 8157.72,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "ESP"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891f5"),
        "Manufacturer" : "Skoda",
        "Colour" : "White",
        "Model" : "Fabia",
        "Milage" : 53574,
        "Price" : 5857.04,
        "Classification" : "Motor Cars",
        "Extras" : [
                "SatNav"
        ]
}
```

6. Display cars having "Manufacturer" name starting with "V".

```
> db.cars.find({Manufacturer:{$regex:/^V/}}).pretty()
```

```
{
	"_id" : ObjectId("63a41361a73fb34b15d891e3"),
	"Manufacturer" : "VW",
	"Colour" : "Blue",
	"Model" : "Polo",
	"Milage" : 79712,
	"Price" : 7311.52,
	"Classification" : "Motor Cars",
	"Extras" : [
		"ABS"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e4"),
	"Manufacturer" : "VW",
	"Colour" : "Blue",
	"Model" : "Passat",
	"Milage" : 75294,
	"Price" : 7488.24,
	"Classification" : "Motor Cars",
	"Extras" : [
		"Aircon"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891ed"),
	"Manufacturer" : "VW",
	"Colour" : "Blue",
	"Model" : "Polo",
	"Milage" : 60604,
	"Price" : 8075.84,
	"Classification" : "Motor Cars",
	"Extras" : [
		"PAS",
		"Auto Wipers",
		"Power Windows"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891ef"),
	"Manufacturer" : "VW",
	"Colour" : "Red",
	"Model" : "Polo",
	"Milage" : 82795,
	"Price" : 7188.2,
	"Classification" : "Motor Cars",
	"Extras" : [
		"ABS"
	]
}
```

```
{
	"_id" : ObjectId("63a41361a73fb34b15d891f4"),
	"Manufacturer" : "VW",
	"Colour" : "Blue",
	"Model" : "Polo",
	"Milage" : 58557,
	"Price" : 8157.72,
	"Classification" : "Motor Cars",
	"Extras" : [
		"PAS",
		"ESP"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891f6"),
	"Manufacturer" : "VW",
	"Colour" : "Red",
	"Model" : "Polo",
	"Milage" : 61193,
	"Price" : 8052.28,
	"Classification" : "Motor Cars",
	"Extras" : [
		"Power Windows"
	]
}
```


7. Display cars having "Model" as " Polo", "Uno", "Fabia".


```
> db.cars.find({Model:{$in:["Polo", "Uno", "Fabia"]}}).pretty()
{
	"_id" : ObjectId("63a41361a73fb34b15d891e3"),
	"Manufacturer" : "VW",
	"Colour" : "Blue",
	"Model" : "Polo",
	"Milage" : 79712,
	"Price" : 7311.52,
	"Classification" : "Motor Cars",
	"Extras" : [
		"ABS"
	]
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e8"),
	"Manufacturer" : "Skoda",
	"Colour" : "Red",
	"Model" : "Fabia",
	"Milage" : 82061,
	"Price" : 4717.56,
	"Classification" : "Motor Cars",
	"Extras" : [
```

```
            "Parking Sensors",
            "SatNav"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e9"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Uno",
        "Milage" : 29978,
        "Price" : 2800.88,
        "Classification" : "Motor Cars",
        "Extras" : [
            "Aircon",
            "Parking Sensors",
            "PAS"
        ]
}
```

(Cont.)

8. Display cars having "Model" as " Polo" and "Milage" greater than 60000.

```
> db.cars.find({Model:{$in:["Polo", "Uno", "Fabia"]}}).pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891e3"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 79712,
        "Price" : 7311.52,
        "Classification" : "Motor Cars",
        "Extras" : [
            "ABS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e8"),
        "Manufacturer" : "Skoda",
        "Colour" : "Red",
        "Model" : "Fabia",
        "Milage" : 82061,
        "Price" : 4717.56,
        "Classification" : "Motor Cars",
        "Extras" : [
            "Parking Sensors",
            "SatNav"
        ]
}
{
```

```
        "_id" : ObjectId("63a41361a73fb34b15d891e9"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Uno",
        "Milage" : 29978,
        "Price" : 2800.88,
        "Classification" : "Motor Cars",
        "Extras" : [
                "Aircon",
                "Parking Sensors",
                "PAS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891ec"),
        "Manufacturer" : "Fiat",
        "Colour" : "White",
        "Model" : "Uno",
        "Milage" : 28875,
        "Price" : 2845,
        "Classification" : "Motor Cars",
        "Extras" : [
                "ABS",
                "Parking Sensors"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891ed"),
        "Manufacturer" : "VW",
        "Colour" : "Blue",
        "Model" : "Polo",
        "Milage" : 60604,
        "Price" : 8075.84,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "Auto Wipers",
                "Power Windows"
        ]
}
```

(Cont.)

9. Display cars not having price between 5000 and 8000.

```
> db.cars.find({$or:[{Price:{$not:{$gt:5000}}}, {Price:{$not:{$lt:8000}}}]}).pretty()
{
        "_id" : ObjectId("63a41361a73fb34b15d891e2"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
```

```
        "Model" : "Panda",
        "Milage" : 33292,
        "Price" : 2668.32,
        "Classification" : "Motor Cars",
        "Extras" : [
                "SatNav",
                "ABS"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e5"),
        "Manufacturer" : "Fiat",
        "Colour" : "Black",
        "Model" : "Punto",
        "Milage" : 30380,
        "Price" : 2784.8,
        "Classification" : "Motor Cars",
        "Extras" : [
                "PAS",
                "Power Windows"
        ]
}
{
        "_id" : ObjectId("63a41361a73fb34b15d891e6"),
        "Manufacturer" : "Fiat",
        "Colour" : "White",
        "Model" : "Panda",
        "Milage" : 32229,
        "Price" : 2710.84,
        "Classification" : "Motor Cars",
        "Extras" : [
                "ABS",
                "Power Windows"
        ]
}
```


(Cont.)

10. Count the number of cars having "Colour" as "White".

```
> db.cars.count({Colour:"White"})
5
```

11. Calculate the price of cars having "Colour" as "Blue".

```
> db.cars.aggregate([{$match:{Colour:"Blue"}}, {$group:{_id:null, "Total price of cars having colour Blue: ":{$sum:"$Price"}}}])
{ "_id" : null, "Total price of cars having colour Blue: " : 46212.92 }
```

12. Calculate the average price of cars having "Colour" as "Blue".

```
> db.cars.aggregate([{$match:{Colour:"Blue"}}, {$group:{_id:null, "Average price of cars having colour Blue: ":{$avg:"$Price"}}}])
{ "_id" : null, "Average price of cars having colour Blue: " : 6601.845714285714 }
```

13. Display cars having maximum price.

```
> db.cars.aggregate([{$group:{_id:null, "Car having maximum price: ":{$max:"$Price"}}}])
{ "_id" : null, "Car having maximum price: " : 8157.72 }
```

14. Display cars having minimum price.

```
> db.cars.aggregate([{$group:{_id:null, "Car having minimum price: ":{$min:"$Price"}}}])
{ "_id" : null, "Car having minimum price: " : 2668.32 }
```

15. Count the number of all cars.

```
> db.cars.count({})
21
```

16. Display cars "Manufacturer" and "Price".

```
> db.cars.aggregate([{$project:{Manufacturer:1, Price:1}}]).pretty()
{
	"_id" : ObjectId("63a41361a73fb34b15d891e2"),
	"Manufacturer" : "Fiat",
	"Price" : 2668.32
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e3"),
	"Manufacturer" : "VW",
	"Price" : 7311.52
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e4"),
	"Manufacturer" : "VW",
	"Price" : 7488.24
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e5"),
	"Manufacturer" : "Fiat",
	"Price" : 2784.8
}
{
	"_id" : ObjectId("63a41361a73fb34b15d891e6"),
	"Manufacturer" : "Fiat",
	"Price" : 2710.84
}
```

(Cont.)

17. Display the entire document of the car with maximum price.

```
cars> db.cars.find().sort({Price:-1}).limit(1).pretty();
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04278"),
    Manufacturer: 'VW',
    Colour: 'Blue',
    Model: 'Polo',
    Milage: 58557,
    Price: 8157.72,
    Classification: 'Motor Cars',
    Extras: [ 'PAS', 'ESP' ]
  }
]
```

19. Display cars where Extras array has exactly 2 elements.

```
cars> db.cars.find({"Extras":{$size:2}})
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
    Price: 2668.32,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'ABS' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04269"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Punto',
    Milage: 30380,
    Price: 2784.8,
    Classification: 'Motor Cars',
    Extras: [ 'PAS', 'Power Windows' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 32229,
    Price: 2710.84,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Power Windows' ]
```

```
  }
```
(Cont.)
```
]
```

20. Display cars having colour as White and Model as Panda.

```
cars> db.cars.find({Colour:"White", Model:"Panda"})
[
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 32229,
    Price: 2710.84,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Power Windows' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31620,
    Price: 2735.2,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'Aircon' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04276"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31274,
    Price: 2749.04,
    Classification: 'Motor Cars',
    Extras: [ 'Power Windows', 'Parking Sensors' ]
  }
]
```

Using aggregate

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}}])
[
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 32229,
```

```
    Price: 2710.84,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Power Windows' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31620,
    Price: 2735.2,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'Aircon' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04276"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31274,
    Price: 2749.04,
    Classification: 'Motor Cars',
    Extras: [ 'Power Windows', 'Parking Sensors' ]
  }
]
```

21. Display sum of prices of White coloured Panda cars.

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}}, {$group:{_id:null,
"Sum of price of cars with colour white and model Panda: ":{$sum:"$Price"}}}])
[
  {
    _id: null,
    'Sum of price of cars with colour white and model Panda: ': 8195.08
  }
]
```

22. Display average price of White coloured Panda cars.

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}}, {$group:{_id:null,
"Average price of cars with colour white and model Panda: ":{$avg:"$Price"}}}])
[
  {
    _id: null,
    'Average price of cars with colour white and model Panda: ': 2731.693333333333
  }
]
```

23. Display the count of White coloured Panda cars.

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}}, {$group:{_id:null,
"Number of cars with colour white and model Panda: ":{$sum:1}}}])
[
  {
    _id: null,
    'Number of cars with colour white and model Panda: ': 3
  }
]
```

24. Export a new database with cars where Colour is White.

```
cars> db.cars.aggregate([{$match:{Colour:"White"}}, {$out:"whitecars"}])

cars> db.whitecars.find()
[
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 32229,
    Price: 2710.84,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Power Windows' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31620,
    Price: 2735.2,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'Aircon' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04270"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Uno',
    Milage: 28875,
    Price: 2845,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Parking Sensors' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04276"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
```

```
    Milage: 31274,
    Price: 2749.04,
    Classification: 'Motor Cars',
    Extras: [ 'Power Windows', 'Parking Sensors' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04279"),
    Manufacturer: 'Skoda',
    Colour: 'White',
    Model: 'Fabia',
    Milage: 53574,
    Price: 5857.04,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav' ]
  }
]
```

25. Export a database where Colour is White and Model is Panda.

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}}, {$out:"cars1"}])

cars> db.cars1.find()
[
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 32229,
    Price: 2710.84,
    Classification: 'Motor Cars',
    Extras: [ 'ABS', 'Power Windows' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31620,
    Price: 2735.2,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'Aircon' ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04276"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31274,
    Price: 2749.04,
```

```
    Classification: 'Motor Cars',
    Extras: [ 'Power Windows', 'Parking Sensors' ]
  }
]
```

26. Export a database where Colour is White and Model is Panda with only fields Manufacturer and Price only.

```
cars> db.cars.aggregate([{$match:{Colour:"White", Model:"Panda"}},
{$project:{Manufacturer:1, Price:1}}, {$out:"cars2"}])

cars> db.cars2.find()
[
  {
    _id: ObjectId("63b3bb102ee3967c7db0426a"),
    Manufacturer: 'Fiat',
    Price: 2710.84
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Price: 2735.2
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04276"),
    Manufacturer: 'Fiat',
    Price: 2749.04
  }
]
```

27. Unwind the database on the basis of Extras array.

```
cars> db.cars.aggregate([{$unwind:"$Extras"}])
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
    Price: 2668.32,
    Classification: 'Motor Cars',
    Extras: 'SatNav'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
```

```
  Price: 2668.32,
  Classification: 'Motor Cars',
  Extras: 'ABS'
},
{
  _id: ObjectId("63b3bb102ee3967c7db04267"),
  Manufacturer: 'VW',
  Colour: 'Blue',
  Model: 'Polo',
  Milage: 79712,
  Price: 7311.52,
  Classification: 'Motor Cars',
  Extras: 'ABS'
},
{
  _id: ObjectId("63b3bb102ee3967c7db04268"),
  Manufacturer: 'VW',
  Colour: 'Blue',
  Model: 'Passat',
  Milage: 75294,
  Price: 7488.24,
  Classification: 'Motor Cars',
  Extras: 'Aircon'
},
{
  _id: ObjectId("63b3bb102ee3967c7db04269"),
  Manufacturer: 'Fiat',
  Colour: 'Black',
  Model: 'Punto',
  Milage: 30380,
  Price: 2784.8,
  Classification: 'Motor Cars',
  Extras: 'PAS'
},
{
  _id: ObjectId("63b3bb102ee3967c7db04269"),
  Manufacturer: 'Fiat',
  Colour: 'Black',
  Model: 'Punto',
  Milage: 30380,
  Price: 2784.8,
  Classification: 'Motor Cars',
  Extras: 'Power Windows'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426a"),
  Manufacturer: 'Fiat',
  Colour: 'White',
  Model: 'Panda',
  Milage: 32229,
```

```
  Price: 2710.84,
  Classification: 'Motor Cars',
  Extras: 'ABS'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426a"),
  Manufacturer: 'Fiat',
  Colour: 'White',
  Model: 'Panda',
  Milage: 32229,
  Price: 2710.84,
  Classification: 'Motor Cars',
  Extras: 'Power Windows'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426b"),
  Manufacturer: 'Skoda',
  Colour: 'Blue',
  Model: 'Octavia',
  Milage: 42901,
  Price: 6283.96,
  Classification: 'Motor Cars',
  Extras: 'Power Windows'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426b"),
  Manufacturer: 'Skoda',
  Colour: 'Blue',
  Model: 'Octavia',
  Milage: 42901,
  Price: 6283.96,
  Classification: 'Motor Cars',
  Extras: 'Auto Wipers'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426b"),
  Manufacturer: 'Skoda',
  Colour: 'Blue',
  Model: 'Octavia',
  Milage: 42901,
  Price: 6283.96,
  Classification: 'Motor Cars',
  Extras: 'Aircon'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426c"),
  Manufacturer: 'Skoda',
  Colour: 'Red',
  Model: 'Fabia',
  Milage: 82061,
```

```
  Price: 4717.56,
  Classification: 'Motor Cars',
  Extras: 'Parking Sensors'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426c"),
  Manufacturer: 'Skoda',
  Colour: 'Red',
  Model: 'Fabia',
  Milage: 82061,
  Price: 4717.56,
  Classification: 'Motor Cars',
  Extras: 'SatNav'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426d"),
  Manufacturer: 'Fiat',
  Colour: 'Black',
  Model: 'Uno',
  Milage: 29978,
  Price: 2800.88,
  Classification: 'Motor Cars',
  Extras: 'Aircon'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426d"),
  Manufacturer: 'Fiat',
  Colour: 'Black',
  Model: 'Uno',
  Milage: 29978,
  Price: 2800.88,
  Classification: 'Motor Cars',
  Extras: 'Parking Sensors'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426d"),
  Manufacturer: 'Fiat',
  Colour: 'Black',
  Model: 'Uno',
  Milage: 29978,
  Price: 2800.88,
  Classification: 'Motor Cars',
  Extras: 'PAS'
},
{
  _id: ObjectId("63b3bb102ee3967c7db0426e"),
  Manufacturer: 'Skoda',
  Colour: 'Blue',
  Model: 'Superb',
  Milage: 48056,
```

```
    Price: 6077.76,
    Classification: 'Motor Cars',
    Extras: 'ESP'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426e"),
    Manufacturer: 'Skoda',
    Colour: 'Blue',
    Model: 'Superb',
    Milage: 48056,
    Price: 6077.76,
    Classification: 'Motor Cars',
    Extras: 'PAS'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426e"),
    Manufacturer: 'Skoda',
    Colour: 'Blue',
    Model: 'Superb',
    Milage: 48056,
    Price: 6077.76,
    Classification: 'Motor Cars',
    Extras: 'SatNav'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db0426f"),
    Manufacturer: 'Fiat',
    Colour: 'White',
    Model: 'Panda',
    Milage: 31620,
    Price: 2735.2,
    Classification: 'Motor Cars',
    Extras: 'SatNav'
  }
]
Type "it" for more
```

28. Unwind the database on the basis of Extras array and only display first three documents.

```
cars> db.cars.aggregate([{$unwind:"$Extras"}, {$limit:3}])
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
    Price: 2668.32,
    Classification: 'Motor Cars',
```

```
    Extras: 'SatNav'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
    Price: 2668.32,
    Classification: 'Motor Cars',
    Extras: 'ABS'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04267"),
    Manufacturer: 'VW',
    Colour: 'Blue',
    Model: 'Polo',
    Milage: 79712,
    Price: 7311.52,
    Classification: 'Motor Cars',
    Extras: 'ABS'
  }
]
```

29. Unwind the database on the basis of Extras array and skip the first three documents.

```
cars> db.cars.aggregate([{$unwind:"$Extras"}, {$skip:3}])
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04268"),
    Manufacturer: 'VW',
    Colour: 'Blue',
    Model: 'Passat',
    Milage: 75294,
    Price: 7488.24,
    Classification: 'Motor Cars',
    Extras: 'Aircon'
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04269"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Punto',
    Milage: 30380,
    Price: 2784.8,
    Classification: 'Motor Cars',
    Extras: 'PAS'
  },
  {
```

```
    _id: ObjectId("63b3bb102ee3967c7db04269"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Punto',
    Milage: 30380,
    Price: 2784.8,
    Classification: 'Motor Cars',
    Extras: 'Power Windows'
  }
```
(Cont.)
```
]
```

30. Add an array called Dimension:[1000, 500] to all the documents.

```
cars> db.cars.updateMany({}, {$set:{Dimension:[1000, 500]}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 21,
  modifiedCount: 21,
  upsertedCount: 0
}

cars> db.cars.find().pretty()
[
  {
    _id: ObjectId("63b3bb102ee3967c7db04266"),
    Manufacturer: 'Fiat',
    Colour: 'Black',
    Model: 'Panda',
    Milage: 33292,
    Price: 2668.32,
    Classification: 'Motor Cars',
    Extras: [ 'SatNav', 'ABS' ],
    Dimension: [ 1000, 500 ]
  },
  {
    _id: ObjectId("63b3bb102ee3967c7db04267"),
    Manufacturer: 'VW',
    Colour: 'Blue',
    Model: 'Polo',
    Milage: 79712,
    Price: 7311.52,
    Classification: 'Motor Cars',
    Extras: [ 'ABS' ],
    Dimension: [ 1000, 500 ]
  }
```

(Cont.)
```
]
```

Show all records.

```
inventory> db.inventory.find()
[
  {
    _id: ObjectId("63ccf7df04ccbffd526d1b79"),
    itemname: 'Pen',
    quantity: 37,
    size: { height: 10, width: 2, unit: 'cm' },
    quality: 'B',
    instock: [
      { warehouse: 'w2', quantity: 1 },
      { warehouse: 'w3', quantity: 16 }
    ]
  },
  {
    _id: ObjectId("63ccf7df04ccbffd526d1b7a"),
    itemname: 'Marker',
    quantity: 58,
    size: { height: 10, width: 3.5, unit: 'cm' },
    quality: 'A',
    instock: [
      { warehouse: 'w1', quantity: 20 },
      { warehouse: 'w2', quantity: 7 },
      { warehouse: 'w3', quantity: 31 }
    ]
  },
  {
    _id: ObjectId("63ccf7df04ccbffd526d1b7b"),
    itemname: 'Notebook',
    quantity: 350,
    size: { height: 12, width: 0.7, unit: 'inch' },
    quality: 'C',
    instock: [
      { warehouse: 'w1', quantity: 170 },
      { warehouse: 'w3', quantity: 70 }
    ]
  },
(Cont.)
]
```

1. Perform map reduce on the data to display the sum of quantities of each record.

```
inventory> var map1=function(){emit(this.itemname, this.quantity)}
inventory> var reduce1=function(itemname, quantity){return Array.sum(quantity)}
inventory> db.inventory.mapReduce(map1, reduce1, {out:"newdoc"})
```

```
DeprecationWarning: Collection.mapReduce() is deprecated. Use an aggregation instead.
See https://docs.mongodb.com/manual/core/map-reduce for details.
{ result: 'newdoc', ok: 1 }
inventory> db.newdoc.find()
[
  { _id: 'Cutter', value: 68 },
  { _id: 'Pencil', value: 680 },
  { _id: 'Ruler', value: 123 },
  { _id: 'Writing Pad', value: 107 },
  { _id: 'Tape', value: 360 },
  { _id: 'Boardpins', value: 75 },
  { _id: 'Eraser', value: 76 },
  { _id: 'Pen', value: 167 },
  { _id: 'Crayons', value: 40 },
  { _id: 'Marker', value: 152 },
  { _id: 'Notebook', value: 350 }
]
```

2. Perform map reduce to display the average quantities of all items.

```
inventory> var reduce2=function(itemname, quantity){return Array.avg(quantity)}
inventory> db.inventory.mapReduce(map1, reduce2, {out:"newdoc2"})
{ result: 'newdoc2', ok: 1 }
inventory> db.newdoc2.find()
[
  { _id: 'Notebook', value: 350 },
  { _id: 'Cutter', value: 68 },
  { _id: 'Marker', value: 50.666666666666664 },
  { _id: 'Pencil', value: 340 },
  { _id: 'Crayons', value: 40 },
  { _id: 'Eraser', value: 76 },
  { _id: 'Pen', value: 55.666666666666664 },
  { _id: 'Writing Pad', value: 107 },
  { _id: 'Tape', value: 360 },
  { _id: 'Boardpins', value: 75 },
  { _id: 'Ruler', value: 123 }
]
```

3. Sort the resultant records in descending order.

```
inventory> db.newdoc2.find().sort({value:-1})
[
  { _id: 'Tape', value: 360 },
  { _id: 'Notebook', value: 350 },
  { _id: 'Pencil', value: 340 },
  { _id: 'Ruler', value: 123 },
  { _id: 'Writing Pad', value: 107 },
  { _id: 'Eraser', value: 76 },
  { _id: 'Boardpins', value: 75 },
  { _id: 'Cutter', value: 68 },
  { _id: 'Pen', value: 55.666666666666664 },
  { _id: 'Marker', value: 50.666666666666664 },
```

```
  { _id: 'Crayons', value: 40 }
]
```

4. **Perform Map Reduce to display the sum of quantities of records which have quality as ‘C’.**

```
inventory> db.inventory.mapReduce(map1, reduce1, {query:{quality:"C"}, out:"newdoc3"})
{ result: 'newdoc3', ok: 1 }
inventory> db.newdoc3.find()
[
  { _id: 'Crayons', value: 40 },
  { _id: 'Notebook', value: 350 },
  { _id: 'Pencil', value: 680 }
]
```

5. **Perform Map Reduce to display the average of quantities of all records which have quality as ‘C’. Display only the first 2 records.**

```
inventory> db.inventory.mapReduce(map1, reduce2, {query:{quality:"C"}, out:"newdoc4",
limit:2})
{ result: 'newdoc4', ok: 1 }
inventory> db.newdoc4.find()
[ { _id: 'Notebook', value: 350 }, { _id: 'Pencil', value: 340 } ]
```

6. **Create a single index for quantities of items in ascending order.**

```
inventory> db.inventory.createIndex({quantity:1})
quantity_1
```

7. **Create an index to store quantities in descending order and item names in ascending order.**

```
inventory> db.inventory.createIndex({quantity:-1, itemname:1})
quantity_-1_itemname_1
```

8. **Create an index to store the unit of size and item name, both in ascending order and give it a name.**

```
inventory> db.inventory.createIndex({'size.unit':1, itemname:1}, {name:"Size and Name
Index"})
Size and Name Index
```

9. **Show all index.**

```
inventory> db.inventory.getIndexes()
[
  { v: 2, key: { _id: 1 }, name: '_id_' },
  { v: 2, key: { quantity: 1 }, name: 'quantity_1' },
  {
    v: 2,
    key: { quantity: -1, itemname: 1 },
    name: 'quantity_-1_itemname_1'
  },
  {
    v: 2,
```

```
    key: { 'size.unit': 1, itemname: 1 },
    name: 'Size and Name Index'
  }
]
```

10. Delete an index.

```
inventory> db.inventory.dropIndex({quantity:1})
{ nIndexesWas: 4, ok: 1 }
inventory> db.inventory.getIndexes()
[
  { v: 2, key: { _id: 1 }, name: '_id_' },
  {
    v: 2,
    key: { quantity: -1, itemname: 1 },
    name: 'quantity_-1_itemname_1'
  },
  {
    v: 2,
    key: { 'size.unit': 1, itemname: 1 },
    name: 'Size and Name Index'
  }
]
```

US-TCS-604 – Big Data Analytics
Practical 7 – MongoDB in Python

Connect MongoDB in Python and perform CRUD operations.

Step 1: Install pymongo.

pip install pymongo

Step 2: Run the following:

```
import pymongo
myclient = pymongo.MongoClient("mongodb://127.0.0.1:27017/")

mydbase = myclient["mydb"]
print("DB Created")

#List all dbs in mongodb
print(myclient.list_database_names())

dblist=myclient.list_database_names()
if "mydb" in dblist:
   print("Database exists")
else:
   print("Not existing")
```

```
#Add data and check
mydata = mydbase["customers"]
print (mydbase.list_collection_names())
#Insert data
dict1 = {"name": "Krishi", "address":"Ghatkopar"}
a = mydata.insert_one(dict1)
print(a.inserted_id)
```

DB Created
['admin', 'cars', 'config', 'inventory', 'kcc', 'letssee', 'local', 'mydb']
Database exists
['customers']
63cd107bdd7f1081071ef3af

```
b = mydata.find_one()
print(b)
```
{'_id': ObjectId('63cd107bdd7f1081071ef3af'), 'name': 'Krishi', 'address': 'Ghatkopar'}

```
list1 = [{"name": "Krishi", "address":"Ghatkopar"}, {"name": "Sabahat",
"address":"Mumbra"}, {"name":"Disha" , "address":"Andheri"},
      {"name":"Yash" , "address":"Lower Parel"}, {"name":"Ansh" ,
"address":"Goregaon"}, {"name": "Krishi", "address":"Ghatkopar"}]
c = mydata.insert_many(list1)
print("Records inserted successfully: " + str(c.inserted_ids))
```
Records inserted successfully: [ObjectId('63cd108ddd7f1081071ef3b0'),
ObjectId('63cd108ddd7f1081071ef3b1'), ObjectId('63cd108ddd7f1081071ef3b2'),
ObjectId('63cd108ddd7f1081071ef3b3'), ObjectId('63cd108ddd7f1081071ef3b4'),
ObjectId('63cd108ddd7f1081071ef3b5')]

```
print("Records:\n")
for data in mydata.find():
   print(data)
```

Records:

{'_id': ObjectId('63cd107bdd7f1081071ef3af'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b0'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b1'), 'name': 'Sabahat', 'address': 'Mumbra'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b2'), 'name': 'Disha', 'address': 'Andheri'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b3'), 'name': 'Yash', 'address': 'Lower Parel'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b4'), 'name': 'Ansh', 'address': 'Goregaon'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b5'), 'name': 'Krishi', 'address': 'Ghatkopar'}

```
myq = {"address":"Ghatkopar"}
mydoc1 = mydata.find(myq)
print("\nAddress: ")
for data in mydoc1:
```

```
   print(data)
```

Address:
{'_id': ObjectId('63cd107bdd7f1081071ef3af'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b0'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b5'), 'name': 'Krishi', 'address': 'Ghatkopar'}

```
sorted1 = mydata.find().sort("name")
print("\n\nSorted:\n\n")
for data in sorted1:
   print(data)
```

Sorted:

{'_id': ObjectId('63cd108ddd7f1081071ef3b4'), 'name': 'Ansh', 'address': 'Goregaon'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b2'), 'name': 'Disha', 'address': 'Andheri'}
{'_id': ObjectId('63cd107bdd7f1081071ef3af'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b0'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b5'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b1'), 'name': 'Sabahat', 'address': 'Mumbra'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b3'), 'name': 'Yash', 'address': 'Lower Parel'}

```
del1 = {"name":"Krishi"}
d1 = mydata.delete_one(del1)

for data in mydata.find():
   print(data)

print("Records deleted: " + str(d1.deleted_count))

del1 = {"name":"Krishi"}
d1 = mydata.delete_many(del1)

for data in mydata.find():
   print(data)

print("Records deleted: " + str(d1.deleted_count))
```

{'_id': ObjectId('63cd108ddd7f1081071ef3b0'), 'name': 'Krishi', 'address': 'Ghatkopar'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b1'), 'name': 'Sabahat', 'address': 'Mumbra'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b2'), 'name': 'Disha', 'address': 'Andheri'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b3'), 'name': 'Yash', 'address': 'Lower Parel'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b4'), 'name': 'Ansh', 'address': 'Goregaon'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b5'), 'name': 'Krishi', 'address': 'Ghatkopar'}

Records deleted: 1
{'_id': ObjectId('63cd108ddd7f1081071ef3b1'), 'name': 'Sabahat', 'address': 'Mumbra'}

{'_id': ObjectId('63cd108ddd7f1081071ef3b2'), 'name': 'Disha', 'address': 'Andheri'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b3'), 'name': 'Yash', 'address': 'Lower Parel'}
{'_id': ObjectId('63cd108ddd7f1081071ef3b4'), 'name': 'Ansh', 'address': 'Goregaon'}

Records deleted: 2

US-TCS-604 – Big Data Analytics
Practical 8 – MongoDB in Java

1. Create a Java project in Eclipse without the module-info.java module.
2. Right click on the project in the Package Explorer and go to Properties.
3. In the Java Build Path section, go to Libraries tab.
4. Select **classpath** and click on Add External Jars.
5. Add both the drivers: **mongodb-driver-core-3.11.2.jar** and **mongo-java-driver-3.11.2.jar**
6. Now, Create a new Class (here: MongoConnection)

ESTABLISHING CONNECTION TO MONGODB AND CREATING A COLLECTION

Code:

```
import com.mongodb.client.MongoDatabase;
import com.mongodb.MongoClient;

public class MongoConnection {

	public static void main(String[] args) {
		MongoClient mongo = new MongoClient("localhost", 27017);
		System.out.println("Established connection successfully.");
		MongoDatabase database = mongo.getDatabase("mydb");
		System.out.println("Connected to database mydb.");
		database.createCollection("customers");
		System.out.println("Collection customers created.");
		mongo.close();
	}
}
```

Output:

```
Jan 24, 2023 10:03:39 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE,
requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms',
maxWaitQueueSize=500}
Established connection successfully.
Connected to database mydb.
Jan 24, 2023 10:03:39 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:03:39 AM com.mongodb.diagnostics.logging.JULLogger log
```

INFO: Opened connection [connectionId{localValue:1, serverValue:1}] to localhost:27017
Jan 24, 2023 10:03:39 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED, ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0, maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30, roundTripTimeNanos=1984900}
Jan 24, 2023 10:03:39 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:2}] to localhost:27017
Collection customers created.

LISTING AND DROPPING COLECTIONS

Code:

```
import com.mongodb.client.MongoCollection;
import com.mongodb.client.MongoDatabase;
import org.bson.Document;
import com.mongodb.MongoClient;

public class MongoCollections {

	public static void main(String args[]) {
		MongoClient mongo = new MongoClient( "localhost" , 27017 );
		System.out.println("Created Mongo Connection successfully");
		MongoDatabase database = mongo.getDatabase("mydb");
		System.out.println("Connected to Database.");

		database.createCollection("customers2");
	   System.out.println("Collection named 'customers2' created successfully.");

		System.out.println("Collections present in this Database are:");
	   for (String name : database.listCollectionNames()) {
	      System.out.println(name);
	   }

	   MongoCollection<Document> collection = database.getCollection("customers2");
	   System.out.println("Collection named 'customers2' selected successfully.");

	   collection.drop();
	   System.out.println("Collection named 'customers2' dropped successfully.");

	   System.out.println("Collections present in this Database are:");
	   for (String name : database.listCollectionNames()) {
	      System.out.println(name);
	   }
	   mongo.close();

	}
}
```

Output:

Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE, requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms', maxWaitQueueSize=500}
Created Mongo Connection successfully
Connected to Database.
Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:1, serverValue:19}] to localhost:27017
Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED, ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0, maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30, roundTripTimeNanos=2100600}
Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:20}] to localhost:27017
Collection named 'customers2' created successfully.
Collections present in this Database are:
customers
customers2
Collection named 'customers2' selected successfully.
Collection named 'customers2' dropped successfully.
Collections present in this Database are:
customers
Jan 24, 2023 10:59:22 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Closed connection [connectionId{localValue:2, serverValue:20}] to localhost:27017 because the pool has been closed.

INSERTING RECORDS

Code:

```
import com.mongodb.client.MongoCollection;
import com.mongodb.client.MongoDatabase;
import java.util.ArrayList;
import java.util.List;
import org.bson.Document;
import com.mongodb.MongoClient;

public class MongoInsertRecords {

	public static void main(String[] args) {
		MongoClient mongo = new MongoClient( "localhost" , 27017 );
		System.out.println("Created Mongo Connection successfully");
		MongoDatabase database = mongo.getDatabase("mydb");
```

```
                System.out.println("Connected to Database.");

                MongoCollection<Document> collection =
database.getCollection("customers");
                System.out.println("Collection 'customers' is selected successfully.");

                Document document1 = new Document("name", "Krishi").append("address",
"Ghatkopar");;
                collection.insertOne(document1);
                System.out.println("One record inserted successfully.");

                List<Document> list = new ArrayList<Document>();
                Document document2 = new Document("name",
"Sabahat").append("address", "Mumbra");
                Document document3 = new Document("name", "Nidhi").append("address",
"Chembur");
                Document document4 = new Document("name", "Praditi").append("address",
"Kurla");
                Document document5 = new Document("name", "Priti").append("address",
"Thane");
                list.add(document2);
                list.add(document3);
                list.add(document4);
                list.add(document5);

                collection.insertMany(list);
                System.out.println("Multiple records inserted successfully.");
                mongo.close();
        }

}
```

Output:

```
Jan 24, 2023 10:28:01 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE,
requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms',
maxWaitQueueSize=500}
Created Mongo Connection successfully
Connected to Database.
Collection 'customers' is selected successfully.
Jan 24, 2023 10:28:01 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:28:01 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:1, serverValue:6}] to localhost:27017
Jan 24, 2023 10:28:01 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description
ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED,
ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0,
```

maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30, roundTripTimeNanos=3152400}
Jan 24, 2023 10:28:01 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:7}] to localhost:27017
One record inserted successfully.
Multiple records inserted successfully.

RETRIEVING RECORDS

Code:

```
import com.mongodb.client.FindIterable;
import com.mongodb.client.MongoCollection;
import com.mongodb.client.MongoDatabase;
import com.mongodb.client.MongoCursor;
import java.util.Iterator;
import org.bson.Document;
import com.mongodb.BasicDBObject;
import com.mongodb.MongoClient;

public class MongoRetrieve {

	public static void main(String[] args) {
		MongoClient mongo = new MongoClient( "localhost" , 27017 );
		System.out.println("Created Mongo Connection successfully");
		MongoDatabase database = mongo.getDatabase("mydb");
		System.out.println("Connected to Database.");

		MongoCollection<Document> collection =
database.getCollection("customers");
		System.out.println("Collection 'customers' is selected successfully.");

		FindIterable<Document> iterDoc = collection.find();
		int i = 1;
		System.out.println("Records in Customers collection:");
		Iterator it = iterDoc.iterator();
		while (it.hasNext()) {
			System.out.println(it.next());
			i++;
		}

	BasicDBObject searchQuery = new BasicDBObject();
		searchQuery.put("name", "Nidhi");
		System.out.println("Retrieving specific Mongo Document named Nidhi");
		MongoCursor<Document> cursor = collection.find(searchQuery).iterator();
		while (cursor.hasNext()) {
		   System.out.println(cursor.next());
		}

	mongo.close();
```

```
        }
}
```

Output:

```
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE,
requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms',
maxWaitQueueSize=500}
Created Mongo Connection successfully
Connected to Database.
Collection 'customers' is selected successfully.
Records in Customers collection:
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:1, serverValue:10}] to localhost:27017
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description
ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED,
ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0,
maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30,
roundTripTimeNanos=1987600}
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:11}] to localhost:27017
Document{{_id=63cf6559f05b306a9b7edf72, name=Krishi, address=Ghatkopar}}
Document{{_id=63cf6559f05b306a9b7edf73, name=Sabahat, address=Mumbra}}
Document{{_id=63cf6559f05b306a9b7edf74, name=Nidhi, address=Chembur}}
Document{{_id=63cf6559f05b306a9b7edf75, name=Praditi, address=Kurla}}
Document{{_id=63cf6559f05b306a9b7edf76, name=Priti, address=Thane}}
Retrieving specific Mongo Document named Nidhi
Document{{_id=63cf6559f05b306a9b7edf74, name=Nidhi, address=Chembur}}
Jan 24, 2023 10:39:34 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Closed connection [connectionId{localValue:2, serverValue:11}] to localhost:27017
because the pool has been closed.
```

UPDATING RECORDS

Code:

```
import com.mongodb.client.FindIterable;
import com.mongodb.client.MongoCollection;
import com.mongodb.client.MongoDatabase;
import com.mongodb.client.model.Filters;
import com.mongodb.client.model.Updates;
import com.mongodb.client.MongoCursor;
import java.util.Iterator;
import org.bson.Document;
import com.mongodb.BasicDBObject;
import com.mongodb.MongoClient;
```

```
public class MongoUpdate {

	public static void main(String[] args) {
		MongoClient mongo = new MongoClient( "localhost" , 27017 );
		System.out.println("Created Mongo Connection successfully");
		MongoDatabase database = mongo.getDatabase("mydb");
		System.out.println("Connected to Database.");

		MongoCollection<Document> collection =
database.getCollection("customers");
		System.out.println("Collection 'customers' is selected successfully.");

	    BasicDBObject searchQuery = new BasicDBObject();
		searchQuery.put("address", "Ghatkopar");
		System.out.println("Retrieving specific Mongo Document where address is
Ghatkopar");
		MongoCursor<Document> cursor = collection.find(searchQuery).iterator();
		while (cursor.hasNext()) {
		   System.out.println(cursor.next());
		}

		collection.updateOne(Filters.eq("name", "Priti"), Updates.set("address",
"Ghatkopar"));
	    System.out.println("Document with name Priti has been updated successfully.");

		searchQuery.put("address", "Ghatkopar");
		System.out.println("Retrieving specific Mongo Document where address is
Ghatkopar");
		cursor = collection.find(searchQuery).iterator();
		while (cursor.hasNext()) {
		   System.out.println(cursor.next());
		}

	    mongo.close();

	}

}
```

Output:

```
Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE,
requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms',
maxWaitQueueSize=500}
Created Mongo Connection successfully
Connected to Database.
Collection 'customers' is selected successfully.
Retrieving specific Mongo Document where address is Ghatkopar
```

Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:1, serverValue:15}] to localhost:27017
Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description
ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED,
ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0,
maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30,
roundTripTimeNanos=2863000}
Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:16}] to localhost:27017
Document{{_id=63cf6559f05b306a9b7edf72, name=Krishi, address=Ghatkopar}}
Document with name Priti has been updated successfully.
Retrieving specific Mongo Document where address is Ghatkopar
Document{{_id=63cf6559f05b306a9b7edf72, name=Krishi, address=Ghatkopar}}
Document{{_id=63cf6559f05b306a9b7edf76, name=Priti, address=Ghatkopar}}
Jan 24, 2023 10:46:51 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Closed connection [connectionId{localValue:2, serverValue:16}] to localhost:27017
because the pool has been closed.

DELETING RECORDS/DOCUMENTS

Code:

```
import com.mongodb.client.FindIterable;
import com.mongodb.client.MongoCollection;
import com.mongodb.client.MongoDatabase;
import com.mongodb.client.MongoCursor;
import java.util.Iterator;
import org.bson.Document;
import com.mongodb.MongoClient;

public class MongoDelete {

	public static void main(String[] args) {
		MongoClient mongo = new MongoClient( "localhost" , 27017 );
		System.out.println("Created Mongo Connection successfully");
		MongoDatabase database = mongo.getDatabase("mydb");
		System.out.println("Connected to Database.");

		MongoCollection<Document> collection =
database.getCollection("customers");
		System.out.println("Collection 'customers' is selected successfully.");

		FindIterable<Document> iterDoc = collection.find();
		int i = 1;

		System.out.println("Records in Customers collection:");
		Iterator it = iterDoc.iterator();
```

```
            while (it.hasNext()) {
                System.out.println(it.next());
                i++;
            }

            collection.deleteOne(Filters.eq("name", "Krishi"));
        System.out.println("Document named 'Krishi' deleted successfully.");
            // Getting the iterable object
        iterDoc = collection.find();
            i = 1;

            System.out.println("Records in Customers collection:");
            it = iterDoc.iterator();
            while (it.hasNext()) {
                System.out.println(it.next());
                i++;
            }

        mongo.close();


    }

}
```

Output:

```
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster created with settings {hosts=[localhost:27017], mode=SINGLE,
requiredClusterType=UNKNOWN, serverSelectionTimeout='30000 ms',
maxWaitQueueSize=500}
Created Mongo Connection successfully
Connected to Database.
Collection 'customers' is selected successfully.
Records in Customers collection:
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Cluster description not yet available. Waiting for 30000 ms before timing out
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:1, serverValue:17}] to localhost:27017
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Monitor thread successfully connected to server with description
ServerDescription{address=localhost:27017, type=STANDALONE, state=CONNECTED,
ok=true, version=ServerVersion{versionList=[6, 0, 3]}, minWireVersion=0,
maxWireVersion=17, maxDocumentSize=16777216, logicalSessionTimeoutMinutes=30,
roundTripTimeNanos=2228400}
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Opened connection [connectionId{localValue:2, serverValue:18}] to localhost:27017
Document{{_id=63cf6559f05b306a9b7edf72, name=Krishi, address=Ghatkopar}}
Document{{_id=63cf6559f05b306a9b7edf73, name=Sabahat, address=Mumbra}}
Document{{_id=63cf6559f05b306a9b7edf74, name=Nidhi, address=Chembur}}
```

Document{{_id=63cf6559f05b306a9b7edf75, name=Praditi, address=Kurla}}
Document{{_id=63cf6559f05b306a9b7edf76, name=Priti, address=Ghatkopar}}
Document named 'Krishi' deleted successfully.
Records in Customers collection:
Document{{_id=63cf6559f05b306a9b7edf73, name=Sabahat, address=Mumbra}}
Document{{_id=63cf6559f05b306a9b7edf74, name=Nidhi, address=Chembur}}
Document{{_id=63cf6559f05b306a9b7edf75, name=Praditi, address=Kurla}}
Document{{_id=63cf6559f05b306a9b7edf76, name=Priti, address=Ghatkopar}}
Jan 24, 2023 10:54:32 AM com.mongodb.diagnostics.logging.JULLogger log
INFO: Closed connection [connectionId{localValue:2, serverValue:18}] to localhost:27017 because the pool has been closed.