# MongDB with R packages

Code

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MongoDB with R packages was installed into the virtual environment and runned to execute below tasks:

Task 1

The content of students.json was extracted and imported into collection called students by firstly applied the required libraries and json file of project was imported into database of CW5 with collection named students as shown below:

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```
library(mongolite)

students_scores <- mongo(collection ="students", db="CW5")
students_data <- students_scores$import(file("students.json"))
```

```
incomplete final line found on 'students.json'
```

Next to check the count of data imported into collection - students.

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```
students_scores$count()
```

```
[1] 200
```

Then simplify the collection into dataframe by according to id.

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```
Students <- students_scores$find(sort = '{"_id":1}')
```

Task 2

Aggregate framework function was used by initial “project” function to splitting data. Then follow by “unwind” command to split sub features from the selected feature, which followed by “match” command to query students who achieved score of exam above 60. “group” query was used to compile the output from “match” command above. Lastly, “sort” was executed to end the aggregation framework by displaying the output in ascending order based on the exam scores.

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```
examscore_abv_60 <- students_scores$aggregate('[{"$project":{"_id":"$_id", "nam
e":"$name", "score":"$scores"}},
                                {"$unwind":"$score"},
                                {"$match":{"score.type":"exam", "score.score":{"$g
t":60}}},
                                {"$group":{"_id":"$_id", "score_exam":{"$sum":"$sco
re.score"}}},
                                {"$sort":{"score_exam":1}}]')
examscore_abv_60
```

| | _id <int> | score_exam <dbl> |
|---|---|---|
| 1 | 1 | 60.06045 |
| 2 | 188 | 60.31473 |
| 3 | 79 | 61.20158 |
| 4 | 122 | 61.47627 |
| 5 | 18 | 62.12870 |
| 6 | 118 | 62.20458 |
| 7 | 105 | 62.28389 |
| 8 | 129 | 62.61424 |
| 9 | 111 | 62.74310 |
| 10 | 108 | 63.75595 |

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Task 3

Query to seek the last five students by showing their minimum and maximum scores was executed by aggregation framework as well. Follow with “project” and unwind fuction to split the features. However, “group” command executed based on students’ Id for minimum and maximum scores. Lastly, “sort” parameter to allow in descending order and “limit” to restrict only 5 outputs.

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```
score_last5 <- students_scores$aggregate('[{"$project":{"_id":"$_id", "name":"$nam
e", "score":"$scores.score"}},
                                {"$unwind":"$score"},
                                {"$group":{"_id":"$_id", "min_score":{"$min":"$scor
e"}, "max_score":{"$max":"$score"}}},
                                {"$sort":{"_id":-1}},
                                {"$limit":5}]')
score_last5
```

| | _id <int> | min_score <dbl> | max_score <dbl> |
|---|---|---|---|
| 1 | 199 | 28.86824 | 82.11743 |

| | _id <int> | min_score <dbl> | max_score <dbl> |
|---|---|---|---|
| 2 | 198 | 11.90757 | 64.85650 |
| 3 | 197 | 31.16288 | 79.15856 |
| 4 | 196 | 33.63300 | 78.79257 |
| 5 | 195 | 11.75008 | 90.77751 |

5 rows

Task 4

To query the the average score for student was carried out by using aggregation framework as well. Initiated by “project”, “unwind” parameters then followed by “group” based on the average score and sorted in ascending order. Lastly to visualised the distribution of students’ average scores in the histogram as below:

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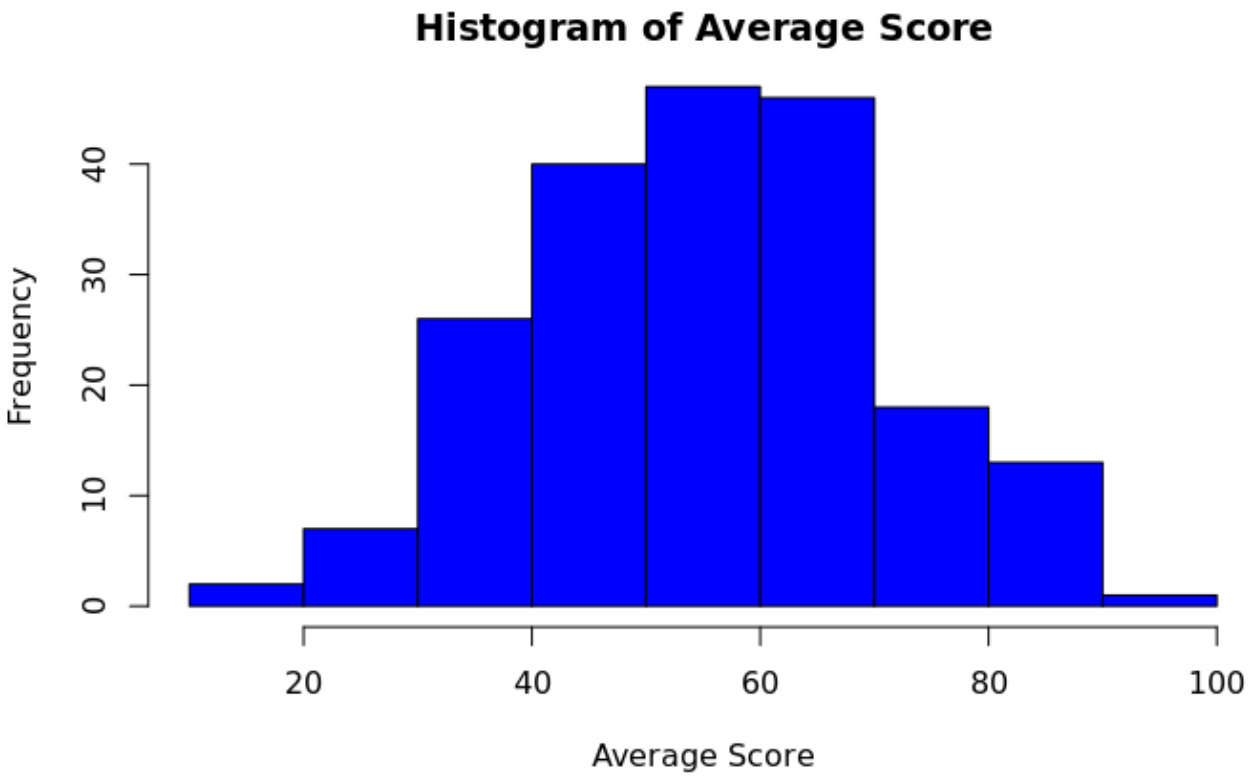
```
score_avg <- students_scores$aggregate('[{"$project":{"_id":"$_id", "name":"$name",
"score":"$scores"}},
                                {"$unwind":"$score"},
                                {"$group":{"_id":"$_id", "Avg_score":{"$avg":"$scor
e.score"}}},
                                {"$sort":{"_id":1}}]')
hist(score_avg$Avg_score, main = "Histogram of Average Score", xlab = "Average Scor
e", col = "blue")
```




Task 5

Binding of two datasets, original dataset of Students and score_avg which structured in task 4 was executed

to formed a new datasets. This new data is in dataframe structure with specific features of id, name and average score which later will be converted into csv file. Lastly it was extraced and displayed as shown below:

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```
final_score <- cbind(Students, score_avg)
final_score <- data.frame(id = final_score$'_id', name = final_score$name, average_
score = final_score$Avg_score)

final_score_csv <- write.csv(final_score, file = "finalscore.csv", row.names = FALS
E)

final_score_db <- read.csv(file = "finalscore.csv")
final_score_db
```

| id <int> | name <fctr> | average_score <dbl> |
|---|---|---|
| 0 | aimee Zank | 16.37332 |
| 1 | Aurelia Menendez | 61.53990 |
| 2 | Corliss Zuk | 46.53869 |
| 3 | Bao Ziglar | 46.23571 |
| 4 | Zachary Langlais | 67.79879 |
| 5 | Wilburn Spiess | 44.67290 |
| 6 | Jenette Flanders | 49.07345 |
| 7 | Salena Olmos | 76.46531 |
| 8 | Daphne Zheng | 37.57226 |
| 9 | Sanda Ryba | 73.36109 |

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