# WS Project

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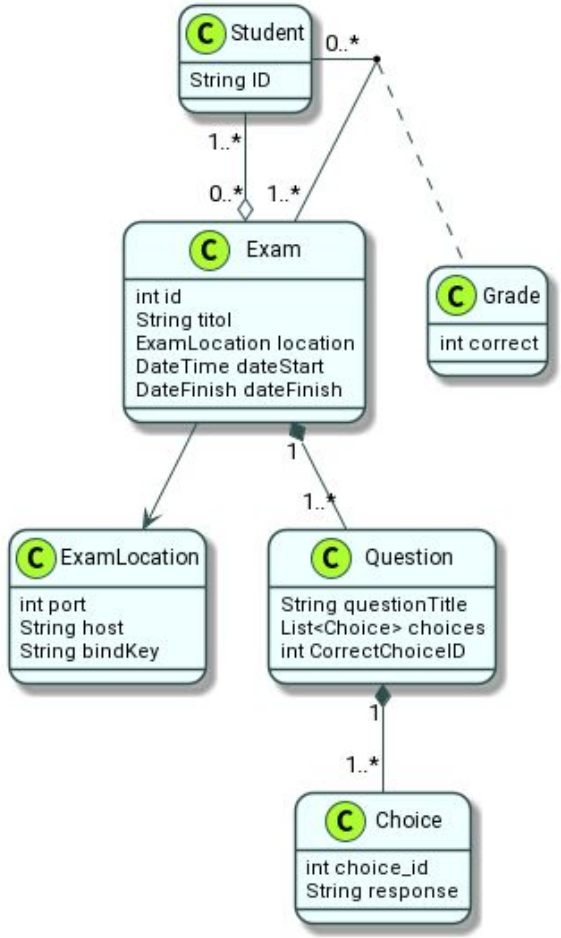
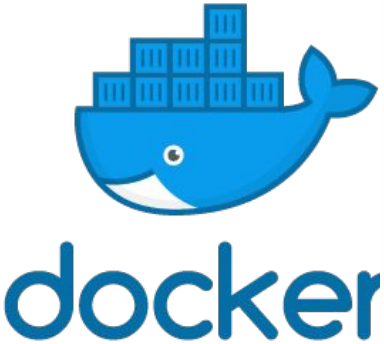
# CLASSES AND UML

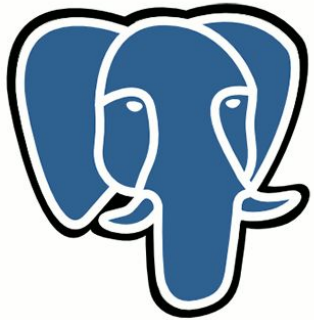
Classes:

- Student
- Exam
- ExamLocation
- Question
- Choice
- Grade



# TECHNOLOGIES

PostgreSQL

# ENDPOINTS

| Endpoints | Operations | Resulting codes | Representations |
|---|---|---|---|
| /api/exam/ | GET | HTTP 200 OK | **Output:**<br>[{“id”: 1, "title": "first exam","description": "first exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]},<br><br>{“id”: 2, "title": "second exam","description": "second exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]}] |
| | GET | HTTP 200 OK | **Input:**<br>?search=second_exam_description<br>**Output:**<br>{“id”: 2, "title": "second exam","description": "second exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]} |
| | POST | HTTP 201 Created | **Input:**<br>{"title": "third exam","description": "third exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]}<br>**Output:**<br>{"title": "third exam","description": "third exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]} |

| | | | |
|---|---|---|---|
| /api/exam/3/ | GET | HTTP 200 OK | **Input:**<br>{“id”: 3}<br>**Output:**<br>{"title": "third exam","description": "third exam description", “date_start": "2021-01-04T01:36:00Z", "date_finish": "2021-01-05T11:40:00Z", "location": {"port": 998, "host": "localhost", "bind_key": "string1"}, "questions": [{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}, {"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}], “students”: [{“studentID”: “423”}]} |
| /api/exam/3/ | DELETE | HTTP 204 No content | No content(undefined) |
| /api/exam/2/desc | GET | HTTP 200 OK | **Output:**<br>{“description": "second exam description"} |
| | PUT | HTTP 200 OK | **Input:**<br>{“description": "exam two description"}<br><br>**Output:**<br>{“description": "exam two description"} |
| /api/exam/1/423 | GET | HTTP 200 OK | **Output:**<br>{"port": 998, "host": "localhost", "bind_key": "string1"} |
| /api/exam/1/grades/ | GET | HTTP 200 OK | **Output:**<br>[{"student": {"studentID": "423"}, "correct": 0}] |
| /api/exam/1/grades/423/ | GET | HTTP 200 OK | **Output:**<br>{"student": {"studentID": "423"}, "correct": 0} |
| | PUT | HTTP 200 OK | **Input:**<br>{“correct": 1}<br><br>**Output:**<br>{"student": {"studentID": "423"}, "correct": 1} |
| /api/location/ | GET | HTTP 200 OK | **Output:**<br>{"port": 998, "host": "localhost", "bind_key": "string1"} |
| | POST | HTTP 201 Created | **Input:**<br>{"port": 998, "host": "localhost", "bind_key": "string2"}<br><br>**Output:**<br>{"port": 998, "host": "localhost", "bind_key": "string2"} |
| /api/location/1/ | GET | HTTP 200 OK | **Input:**<br>{“id": 1} |

| | | | |
|---|---|---|---|
| | | | **Output:**<br>{"port": 998, "host": "localhost", "bind_key": "string1"} |
| /api/question/ | GET | HTTP 200 OK | **Output:**<br>`[{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1},`<br><br>`{"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1},`<br><br>`{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1},`<br><br>`{"title": "second question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}]` |
| | POST | HTTP 201 Created | **Input:**<br>`{"title": "new question", "choices": [{"choice_id": 1, "response": "first response"}, {"choice_id": 2, "response": "second response"}], "correct_choice": 1}`<br><br>**Output:**<br>`{"title": "new question", "choices": [{"choice_id": 1, "response": "first response"}, {"choice_id": 2, "response": "second response"}], "correct_choice": 1}` |
| /api/question/3 | GET | HTTP 200 OK | **Output:**<br>`{"title": "first question", "choices": [{"choice_id": 1, "response": "response one"}], "correct_choice": 1}` |
| | DELETE | HTTP 204 No content | No content(undefined) |

| | | | |
|---|---|---|---|
| /api/student/ | GET | HTTP 200 OK | **Output:**<br>[{"studentID":"78099079A"},{"studentID":"12345632A"},{"studentID":"78103041D"},{"studentID":"78320584C"},{"studentID":"48930SFD2"}] |
| /api/student/78099079A/ | GET | HTTP 200 OK | **Output:**<br>{"studentID":"78099079A"} |
| /api/student/78099079A/grades | GET | HTTP 200 OK | **Output:**<br>[{"student":{"studentID":"78099079A"},"correct":0,"exam_id":1},{"student":{"studentID":"78099079A"},"correct":6,"exam_id":2}] |

# SCREENSHOTS

# List all the exams

```
GET /api/exam/
```

```
HTTP 200 OK
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "id": 7,
        "title": "My First Exam",
        "description": "Distributed Computing exam description",
        "date_start": "2021-01-04T01:36:00Z",
        "date_finish": "2021-01-05T11:40:00Z",
        "location": {
            "port": 998,
            "host": "localhost",
            "bind_key": "string1"
        },
        "questions": [
            {
                "title": "Question 1",
                "choices": [
                    {
                        "choice_id": 1,
                        "response": "response1"
                    }
                ],
                "correct_choice": 1
            }
        ],
        "students": [
            {
                "studentID": "423"
            }
        ]
    },
    {
        "id": 8,
        "title": "My Second Exam",
        "description": "Distributed Computing2 description",
        "date_start": "2021-01-04T01:36:00Z",
        "date_finish": "2021-01-05T11:40:00Z",
        "location": {
            "port": 998,
            "host": "localhost",
            "bind_key": "string1"
        },
        "questions": [
            {
                "title": "Question 1",
                "choices": [
                    {
                        "choice_id": 1,
                        "response": "response1"
                    }
                ],
                "correct_choice": 1
            },
            {
                "title": "Question 2",
                "choices": [
                    {
                        "choice_id": 1,
                        "response": "response1"
                    },
                    {
                        "choice_id": 2,
                        "response": "response2"
                    }
                ],
                "correct_choice": 2
            }
        ],
        "students": [
            {
                "studentID": "423"
            },
            {
                "studentID": "123"
            }
        ]
```

The outcome we obtain when we list all the exams is the attributes, id, title, description, date start, date finish, location,  the list of questions with their respective choices and the list of students, of every one of them.

# Search an exam by its id

```
GET /api/exam/7/
```

```
HTTP 200 OK
Allow: GET, DELETE, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "id": 7,
    "title": "My First Exam",
    "description": "Distributed Computing exam description",
    "date_start": "2021-01-04T01:36:00Z",
    "date_finish": "2021-01-05T11:40:00Z",
    "location": {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    "questions": [
        {
            "title": "Question 1",
            "choices": [
                {
                    "choice_id": 1,
                    "response": "response1"
                }
            ],
            "correct_choice": 1
        }
    ],
    "students": [
        {
            "studentID": "423"
        }
    ]
}
```

Searching an exam by its id we obtain all the parameters that take part of that specific exam.

# Search an exam by its description

Searching a description (“Distributed Computing2 description” in this case) the API found the exam with id=9, and the outcome is all the information of this particular exam.

```
GET /api/exam/?search=Distributed%20Computing2%20description
```

```
HTTP 200 OK
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "id": 8,
        "title": "My Second Exam",
        "description": "Distributed Computing2 description",
        "date_start": "2021-01-04T01:36:00Z",
        "date_finish": "2021-01-05T11:40:00Z",
        "location": {
            "port": 998,
            "host": "localhost",
            "bind_key": "string1"
        },
        "questions": [
            {
                "title": "Question 1",
                "choices": [
                    {
                        "choice_id": 1,
                        "response": "response1"
                    }
                ],
                "correct_choice": 1
            },
            {
                "title": "Question 2",
                "choices": [
                    {
                        "choice_id": 1,
                        "response": "response1"
                    },
                    {
                        "choice_id": 2,
                        "response": "response2"
                    }
                ],
                "correct_choice": 2
            }
        ],
        "students": [
            {
                "studentID": "423"
            },
            {
                "studentID": "123"
            }
        ]
    }
]
```

# Create an exam

Writing all the exam required information, title, description, date_start, date_finish, location, list of questions, list of choices for every question and a list of allowed students; the API creates a new exam and the outcome showed is all these previous information and also the respectively id of that exam.

```
POST /api/exam/
```

```
HTTP 201 Created
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "id": 10,
    "title": "My Third Exam",
    "description": "exam description",
    "date_start": "2021-01-04T01:36:00Z",
    "date_finish": "2021-01-05T11:40:00Z",
    "location": {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    "questions": [
        {
            "title": "Question 1",
            "choices": [
                {
                    "choice_id": 1,
                    "response": "response1"
                }
            ],
            "correct_choice": 1
        },
        {
            "title": "Question 2",
            "choices": [
                {
                    "choice_id": 1,
                    "response": "response1"
                },
                {
                    "choice_id": 2,
                    "response": "response2"
                },
                {
                    "choice_id": 3,
                    "response": "response3"
                }
            ],
            "correct_choice": 2
        }
    ],
    "students": [
        {
            "studentID": "423"
        },
        {
            "studentID": "999"
        }
    ]
}
```

## Delete an exam

```
DELETE /api/exam/10/
```

```
HTTP 204 No Content
Allow: GET, DELETE, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept
```

Specifying an id of an existing exam and deleting it implies that the API shows a message of deletion (no content) with any outcome, because that exam does not exist anymore.

## Show an exam description

```
GET /api/exam/8/desc/
```

```
HTTP 200 OK
Allow: GET, PUT, PATCH, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "description": "Distributed Computing2 description"
}
```

If we specify /desc/ at the end of a particular exam we will receive the description of that exam as the outcome.

## Upload an exam description

```
PUT /api/exam/8/desc/
```

```
HTTP 200 OK
Allow: GET, PUT, PATCH, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "description": "Distributed Computing2 description changed"
}
```

If we change the description of an existing exam we obtained the new description as the outcome.

## Search an student by its id on a exam

```
GET /api/exam/8/123/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "port": 998,
    "host": "localhost",
    "bind_key": "string1"
}
```

When we search if a student is allowed to do a specific exam or not, the outcome we receive is the location of the exam.

## List all the grades of an exam

```
GET /api/exam/8/grades/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "student": {
            "studentID": "423"
        },
        "correct": 0
    },
    {
        "student": {
            "studentID": "123"
        },
        "correct": 0
    }
]
```

We can list all the students grades of an exam, viewing as the outcome a list where we can see for every student its id and its respectively grade.

## Show the exam grade for a specific student

```
GET /api/exam/8/grades/423/
```

```
HTTP 200 OK
Allow: GET, PUT, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "student": {
        "studentID": "423"
    },
    "correct": 0
}
```

If we want to see only the grade of a particular student, the outcome we obtain is only the id of this student and its grade.

# Store grades

```
PUT /api/exam/8/grades/423/
```

```
HTTP 200 OK
Allow: GET, PUT, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "student": {
        "studentID": "423"
    },
    "correct": 2
}
```

Specifying an exam and an allowed student to that exam we are able to change its grade and the API outcome is the student id with the new grade.

# List all locations

The outcome when we list all the locations is a list with all the information of each location (port, host and bind_key).

```
GET /api/location/
```

```
HTTP 200 OK
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    },
    {
        "port": 998,
        "host": "localhost",
        "bind_key": "string1"
    }
]
```

## Create a location

```
POST /api/location/
```

```
HTTP 201 Created
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "port": 998,
    "host": "localhost",
    "bind_key": "string1"
}
```

When we create a new location the outcome we receive is the information of all the parameters of this new location, which are the port, the host and the bind_key.

## Search a location by its id

```
GET /api/location/1/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "port": 998,
    "host": "localhost",
    "bind_key": "string1"
}
```

The outcome shows us the information of the location (port, host and bind_key) of the location with the id we gave as an input.

# List all the questions

The outcome when we list all the questions is a list with all the information of each question (title, the list of choices and the correct choice).

```
GET /api/question/
```

```
HTTP 200 OK
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "title": "Question1",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            }
        ],
        "correct_choice": 1
    },
    {
        "title": "Question 1",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            }
        ],
        "correct_choice": 1
    },
    {
        "title": "Question 1",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            }
        ],
        "correct_choice": 1
    },
    {
        "title": "Question 2",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            },
            {
                "choice_id": 2,
                "response": "response2"
            }
        ],
        "correct_choice": 2
    },
    {
        "title": "Question 1",
        "choices": [
```

```
            {
                "choice_id": 1,
                "response": "response1"
            }
        ],
        "correct_choice": 1
    },
    {
        "title": "Question 2",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            },
            {
                "choice_id": 2,
                "response": "response2"
            }
        ],
        "correct_choice": 2
    },
    {
        "title": "Question 1",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            }
        ],
        "correct_choice": 1
    },
    {
        "title": "Question 2",
        "choices": [
            {
                "choice_id": 1,
                "response": "response1"
            },
            {
                "choice_id": 2,
                "response": "response2"
            },
            {
                "choice_id": 3,
                "response": "response3"
            }
        ],
        "correct_choice": 2
    }
]
```

## Create a question

```
POST /api/question/
```

```
HTTP 201 Created
Allow: GET, POST, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "title": "New question",
    "choices": [
        {
            "choice_id": 1,
            "response": "response1"
        },
        {
            "choice_id": 2,
            "response": "response2"
        },
        {
            "choice_id": 3,
            "response": "response3"
        }
    ],
    "correct_choice": 2
}
```

When we create a question the outcome we receive in exchange is the information of the question we just created.

## Search a question by its id

```
GET /api/question/9/
```

```
HTTP 200 OK
Allow: GET, DELETE, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "title": "Question1",
    "choices": [
        {
            "choice_id": 1,
            "response": "response1"
        }
    ],
    "correct_choice": 1
}
```

The outcome shows us the parameters information of the question with the id we gave as an input.

# Delete a question

```
DELETE /api/question/3/
```

```
HTTP 204 No Content
Allow: GET, DELETE, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept
```

Specifying an id of an existing question and deleting it the API shows us a message of deletion with any outcome, because that question does not exist anymore.

## Listing all the students

```
GET /api/student/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "studentID": "423"
    },
    {
        "studentID": "123"
    },
    {
        "studentID": "999"
    },
    {
        "studentID": "STUDENTID1"
    }
]
```

## Detail of a student

```
GET /api/student/423/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "studentID": "423"
}
```

## List all the grades from a student

```
GET /api/student/423/grades/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

[
    {
        "student": {
            "studentID": "423"
        },
        "correct": 0,
        "exam_id": 7
    },
    {
        "student": {
            "studentID": "423"
        },
        "correct": 2,
        "exam_id": 8
    }
]
```

The response is a list of grade objects composed by the student object, the number of correct answers and the id of the exam.

# GITHUB REPOS & TIME OF WORK

The API can be found in https://github.com/Oriolac/my-exams-api and the RMI project in https://github.com/Marta99/multiple-choice-exam

The estimated hour of work we've dedicated to this project are 100 hours.

# RMI Integration

- Use of java.net.HttpClient for WS Connection.
- Package for the integration and adapt the HttpClient to our features in a higher level.