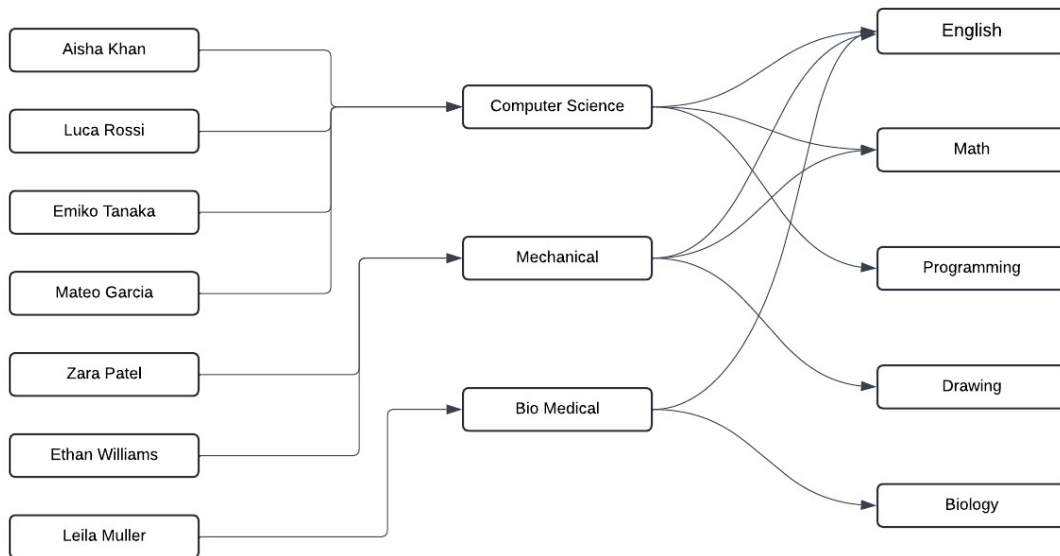


## Important!

Candidates are encouraged to complete this task independently, without relying on tools like ChatGPT (using Google or textbooks is acceptable). We have a system in place to detect external assistance, and submissions will be rejected if such help is suspected.

## Problem 1

Consider this static data



Write C# code to store the above data into memory in such a way that the following operations are fast:

- How many students are there studying English
- How many students are there studying Programming or Drawing
- Add a new entry (student, class, subject)

Note:

- Try to reduce memory footprint so only store the relevant data, no need to store everything.

## Problem 2

Use the same data as provided above in problem 1. Write C# code to store information such that the following operations are fast, and code them as well:

- If student "Luca Rossi" is present
- If student "Luca Rossi" is studying "Biology"

Note:

- Try to reduce memory footprint so only store the relevant data, no need to store everything.

### Problem 3

Use the same data as provided in problem 1. Create a SQL table structure that is capable of storing above data.

### Problem 4

There exists a backend API that has the following signature:

URL: <https://myjureli.site/student/add>

Method: POST

Content-Type: application/json

Sample Input:

```
{
  "class": "Comp Science",
  "subject": [
    "English",
    "Math",
    "Programming"
  ]
}
```

Sample Success Output:

```
{
  "status": "success"
}
```

Sample Failure Output

```
{
  "status": "failure",
  "message": "student already exists"
}
```

Write a simple JavaScript/AJAX call to invoke this API and check for return status.

### Note

Candidates should submit solutions as a zipped file, with code in the correct file extensions for the language (not .txt, .doc, or .pdf).