

# C++ Project 2023/2024

## Overview

Within the framework of the project you will act as a development team.

There are several options for completing the project:

- Template project (ready-made technical specifications);
- Proactive project (you act as a business customer and development team).

## Functional Requirements

### Template project (total 60 points)

A team should develop console application for [clustering problem](#).

Developed program could be used as library and as standalone application.

What should be implemented:

- Clustering algorithms:
  - Input:
    - preprocessed matrix;
    - number of clusters;
  - Output:
    - Marked clusters for input data;
- Interpretation algorithm;
- Supplementary function for reading and writing.
- Documentation with usage examples.

Application running example:

```
clusteringApp.exe -ifile matrix.csv -ncl 4 -ofile clusters.txt -stat statistics.txt
```

clusters.txt like:

```
cluster 1, ids:
1
4
18

cluster 2, ids:
7
2
...

```

OR

```
id cluster
1 1
2 2
3 4
4 1
...
18 1

```

statistics.txt

```
number of clusters: 4
silhouette coefficient values:
cluster 1: 0.35
cluster 2: 0.25
...

```

Available clustering algorithms:

- [hierarchical](#) (agglomerative or divisive)
- [k-medoids](#)
- [k-means](#)

Interpretation algorithm:

- [silhouette method](#)

Dataset for validation:

- [Mall Customer Segmentation Data](#) (tiny size)
- [Customer Personality Analysis](#) (medium size)

### Proactive project (total 80 points)

One might say that the team that chose this type of project has carte blanche. However, the project should include:

- Description of the project: what problems does this program solve?
- External data using (files {csv like}, APIs);
- GUI (not-console / Qt) with MVC approach and not less than 5 different widget types;
- Documentation with usage examples.

## Team Members

A team should consist of 2-3 member from the same subgroup (221-1, 221-2, 222-1 etc.). The team could hire one expert from another subgroup for help. Each expert can earn up to 15 extra points for the work if they can prove their contribution but the team that hire the expert will receive 15 points less in any case.

## GitHub

All projects should be stored in github. Each team member should make at least 3 commits spread over all time project (it is prohibited to make all commits in 5 minutes).

All project should contain a task board for all solved problems with member names and linked commits.

An example:

OctoArcade Invaders

Planning

Sprint Board

Alpha

Roadmap

My work

Features

Priority

By person

Status Board

By status

By Sprint

Done

Filter by keyword or by field

Not Started

🕒 19

Estimate: 37

⋮

planning-tracking-demo #810

Beta go-no-go meeting

planning-tracking-demo #800

Save score across levels

—

planning-tracking-demo #784

Interviews with media outlets

epic

Draft

Enable for teams

planning-tracking-demo #1161

tweak difficulty

planning-tracking-demo #1167

Update README.md

Draft

Prevent the Konami code from bringing down all of GitHub

+ Add item

Planning

🗓 19

Estimate: 109

⋮

planning-tracking-demo #823

Updates and bug fixes to engine from Beta

bug demo

planning-tracking-demo #824

Beta signup page

need help

planning-tracking-demo #806

[Tracking] Upsell / Growth experience

backlog feature

planning-tracking-demo #818

Account subscription design

planning-tracking-demo #828

Acquire domain for launch

planning-tracking-demo #832

Final creative shots from game

planning-tracking-demo #829

+ Add item

Building

🔨 8

Estimate: 40

⋮

planning-tracking-demo #1160

Update documentation

planning-tracking-demo #814

Updates to collision logic

enhancement

planning-tracking-demo #816

Free and paid levels

need help

planning-tracking-demo #831

Documentation and Support

need help

planning-tracking-demo #821

Updates to alien, beam, bomb and cannon sprites

#370

planning-tracking-demo #802

Updates to velocity of the ship and alien movements

+ Add item

Review

🚩 5

Estimate: 17

⋮

planning-tracking-demo #822

Hero site - Development

#12 #1160 in-review task

planning-tracking-demo #808

General bug fixes from Alpha feedback

#992

planning-tracking-demo #1151

Design new launch screen

#374 web

planning-tracking-demo #793

Polished alien, beam, and cannon sprite files

planning-tracking-demo #1101

[Tracking] Integrate payments system

backlog feature

+ Add item