National Research University Higher School of Economics
Faculty of Computer Science
Bachelor's Program in Data Science and Business Analytics (DSBA)

Introduction to Programming, workshops 25-26.

Use the provided template that reads the Titanic data set and fills a vector with **`Passenger`** objects.

https://github.com/l8doku/workshops25-26

Task 1. Custom multisort.

1.

Implement an **`enum class`** data type **`PassengerField`** that represents fields of a **`Passenger`** object.

2.

Implement a custom comparator **`PassengerComparator`** for **`Passenger`** objects. It should have the following features:

1. A private field **`compareField`** of the type **`PassengerField`**.
2. A constructor that takes **`PassengerField`** as input.
3. A method **`setMode`** that changes **`compareField`** to a new field.
4. An overloaded **`operator()`** that implements comparison of two **`Passenger`** objects by comparing the fields corresponding to **`compareField`**.

3.

Sort the vector of passengers using **`std::stable_sort`** and **`PassengerComparator`** in the following ways:

1. First by age. If age is the same, by PClass. If PClass is the same, by number of parents/children (field "Parch").
2. First by PClass, if it's the same – by whether a passengers survived or not. If both fields are the same – by name.

Additional task 1.

Implement a parameter of **`PassengerComparator`** allowing to sort the vector of passengers in descending order. Change the constructor and methods of **`PassengerComparator`** appropriately. Your code implementing tasks 1-3 should still work – use default parameters where needed.

Sort the vector using the first order from part 3 of the task, but this time use descending order for each field.

Additional task 2.

Change field “Embarked” in the structure **`Passenger`** from **`std::string`** to **`enum class`**.

Task 2. Applying functions to collections.

1.

Round all Fare values to integer numbers using std::for_each or transform.

2.

Use std::accumulate to compute the total Fare of all passengers.