

Practice 05

Static members and methods, =default, =delete and more on overloading operators

1. Rational numbers.

Implement a class that represent a rational number ($\frac{a}{b}$) with a numerator and a denominator. Overload operators $+=$, $-=$, $*=$, $/=$, $+$, $-$, $*$, $/$, postfix and prefix $++$ and $--$, $==$, $<$, $<=$, $>$, $>=$, $<<$, $>>$, operator `double()`, unary operator $-$, as well as the unary operator \sim , that should return the reciprocal of the fraction. After each operation that changes the object, the fraction should be simplified. Write a simple program to test the class.

2. Flights system.

A. Implement a simple flights system where each flight has a *unique* ID, departure and destination locations as well as price. The system should allow for new flights to be created and deleted and for *us* to sign up for each flight. Keep track of all the flights we signed up for and how much money we have.

Note: Departure and destination locations will be single words.

B. Create an interactive console application using the system implemented in **A**. The application should accept commands and print information about the executed commands. *List of commands:*

- o `create <departure> <destination> <money>` - Create flight.
- o `delete <ID>` - delete flight with ID.
- o `search <departure> <destination>` - get flight ID.
- o `signup <ID>` - sign up for flight with ID.
- o `money` - shows our money.
- o `all` - shows all flights.
- o `signed` - shows all signed up flights.
- o `help` - shows info about the commands.
- o `bye` - terminates the program.

Sample program input/output:

```
<> Set starting money: 250
<< Program started with $250.

>> create Sofia London 63
<< Created flight with ID 0 from Sofia to London for $63.

>> create Sofia Wuhan 1
<< Created flight with ID 1 from Sofia to Wuhan for $1.

>> all
<< Flights: [ Sofia -> London ($63), Sofia -> Wuhan ($1) ]

>> delete 1
<< Deleted flight with ID 1.
```

```
>> create London Ottawa 192
>> Created flight with ID 2 from London to Ottawa for $192.

>> search London Ottawa
<< Flight from London to Ottawa has ID 2

>> signup 2
<< You are signed up for flight with ID 2 London -> Ottawa ($192).

>> all
<< Flights: [ Sofia -> London ($63), London -> Ottawa ($192) ]

>> signup 0
<< You do not have enough money!

>> money
<< You have $58.

>> signed
<< You are signed up for [ London -> Ottawa ($192) ].

>> bye
<< Have a nice day!
```