**Assignment 7 (Team of 1-5 people)**

**Part 1**

In this task, you should read the text from the file (Task\_1.txt), which is a text about Black Holes by National Geographic.

Create a class **Text\_Preprocessor**. Provide the following methods:

* In the constructor of the class provide the name of the file to open. For example: **Text\_Preprocessor(“Task\_1.txt”)**

It opens the file (use std::ifstream). In the destructor of the class, the file is closed.

Create a method **preprocess\_text** that preprocesses the text as follows:

* Delete following symbols: coma (‘,’), quotes (“ “), dots (‘.’), semicolons (‘;’), double colon (‘:’), exclamation mark (‘!’) and question mark (‘?’)
* Turn every letter of the word into lower case (this step is important, since uppercase and lower-case words are considered different)
* Delete articles: a, an, the
* Delete following prepositions: in, on, at, since, for, before, ago, to, by

Create a method **search\_word(const std::string& str)**:

* This method searches the word in **the preprocessed text** and returns the line where the word is located
* If the word is not found print “Word is not found”

In the main, provide the demonstration of the code: run **search\_word** with some word of your own choice.

**Part 2.**

In this task you need to design concurrent application. The common resource is a file (Task\_2.txt). To start with, read the data from the (Task\_2.txt) and calculate **average** value (sum of all data from Task\_2.txt divided by the amount of numbers). Next create two concurrent threads:

1)  Read data from Task\_2.txt and write the data to the file (Thread\_1.txt) that is bigger than

**average**

2)  Read data from Task\_2.txt and write the data to the file (Thread\_2.txt) that is smaller than **average**

For this task make sure you use mutex to avoid race condition.

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1. Bonus: work with git and upload files to Github, have 3 commits min. Provide link (+3%)
2. Penalty: similarity >70% (-100%)
3. Penalty: late submission (-5% for each hour)
4. Penalty: missing defense (individual -30%)