

Code Problem Similarity Checker

An automated tool to detect similar algorithmic problems from source codes

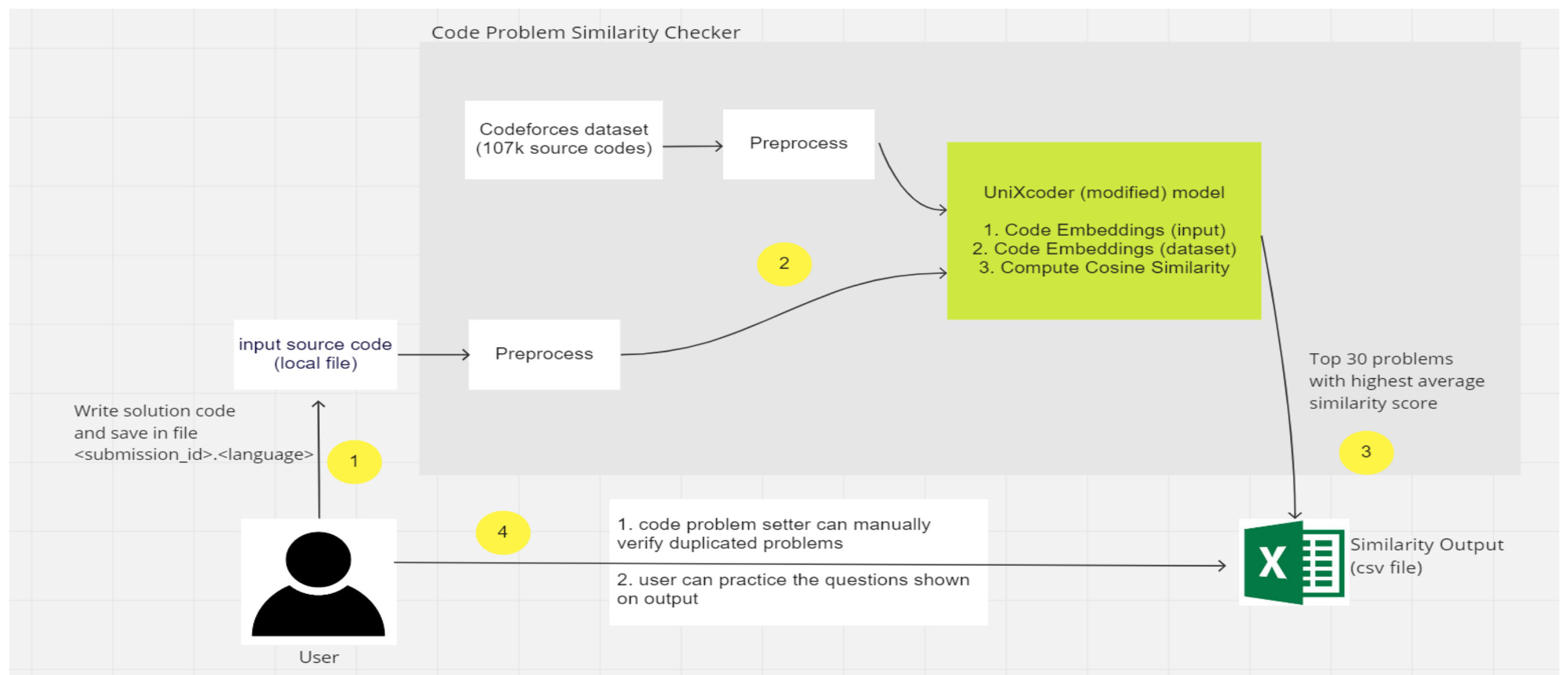
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Project Objectives:

Created a new dataset of 107k source codes in 3 different languages from about ~3k different problems in Codeforces.

Experimented code clone detection using 3 different pre-trained models (C4-CodeBERT, GraphCodeBERT, UniXcoder)

Designed the pipeline for the similarity checker utilizing the best pre-trained model from the experiments



Code Problem

F. Souvenirs

time limit per test: 3 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

Artem is on vacation and wants to buy souvenirs for his two teammates. There are n souvenir shops along the street. In i -th shop Artem can buy one souvenir for a_i dollars, and he cannot buy more than one souvenir in one shop. He doesn't want to introduce envy in his team, so he wants to buy two souvenirs with least possible difference in price.

Artem has visited the shopping street m times. For some strange reason on the i -th day only shops with numbers from l_i to r_i were operating (weird? yes it is, but have you ever tried to come up with a reasonable legend for a range query problem?). For each visit, Artem wants to know the minimum possible difference in prices of two different souvenirs he can buy in the opened shops.

In other words, for each Artem's visit you should find the minimum possible value of $|a_s - a_t|$ where $l_i \leq s, t \leq r_i, s \neq t$.

Input

The first line contains an integer n ($2 \leq n \leq 10^5$).

The second line contains n space-separated integers a_1, \dots, a_n ($0 \leq a_i \leq 10^9$).

The third line contains the number of queries m ($1 \leq m \leq 3 \cdot 10^5$).

Next m lines describe the queries. i -th of these lines contains two space-separated integers l_i and r_i denoting the range of shops working on i -th day ($1 \leq l_i < r_i \leq n$).

Output

Print the answer to each query in a separate line.

Source Code 1

```

82 //add loading spinner to home product card
83 jQuery('.add-to-cart-in-image a').on('click', function() {
84     jQuery(this).text('Adding...');
85 });
86
87
88
89
90 document.addEventListener('DOMContentLoaded', function () {
91     var elems = document.getElementsByClassName('slide');
92     var options = {
93         type: 'loop',
94         perPage: 4,
95         perMove: 4,
96         pagination: false,
97         gap: 1em
98     };
99     768: {
100         perPage: 2,
101         perMove: 2,
102     },
103     };
104     for ( var i = 0, len = elems.length; i < len; i++ ) {
105         new Slide( elems[ i ], options ).mount();
106     }
107 });

```

Problem 1

Clones ?

Source Code 2

```

82 //add loading spinner to home product card
83 jQuery('.add-to-cart-in-image a').on('click', function() {
84     jQuery(this).text('Adding...');
85 });
86
87
88
89
90 document.addEventListener('DOMContentLoaded', function () {
91     var elems = document.getElementsByClassName('slide');
92     var options = {
93         type: 'loop',
94         perPage: 4,
95         perMove: 4,
96         pagination: false,
97         gap: 1em
98     };
99     768: {
100         perPage: 2,
101         perMove: 2,
102     },
103     };
104     for ( var i = 0, len = elems.length; i < len; i++ ) {
105         new Slide( elems[ i ], options ).mount();
106     }
107 });

```

{Problem 2, Problem 3, ...}

Problem Similarity Checker