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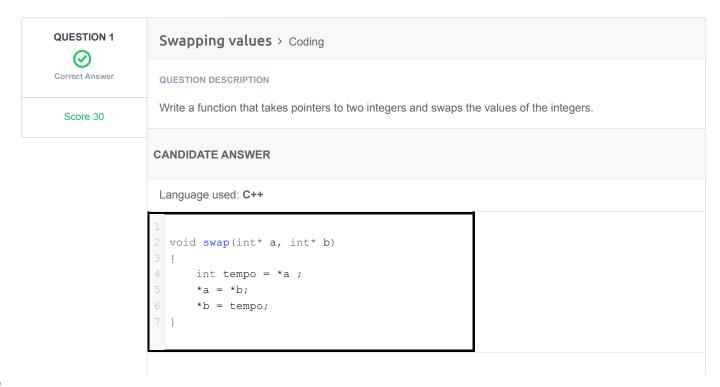
Full Name: Breeha Qasim Email: bq08283@st.habib.edu.pk CS224 Lab# 03 - Fall 2023 V2 Test Name: Taken On: 6 Sep 2023 12:29:37 PKT 3126 min 29 sec/ 7200 min Time Taken: Work Experience: < 1 years Shafaq Fatima Invited by: Skills Score: Tags Score:



Recruiter/Team Comments:

No Comments.

	Question Description	Time Taken	Score	Status
Q1	Swapping values > Coding	8 min 15 sec	30/ 30	⊘
Q2	Points on a line? > Coding	13 hour 35 min 2 sec	70/70	⊘
Q3	Bad Intern > Coding	21 min	30/ 30	Ø



	TESTCASE	DIFFICULTY	TYPE	STATUS	SCORE	TIME TAKEN	MEMORY USED
Т	estcase 0	Easy	Sample case	Success	10	0.0313 sec	8.84 KB
Т	estcase 1	Easy	Hidden case	Success	10	0.0211 sec	8.85 KB
Т	estcase 2	Easy	Hidden case	Success	10	0.0506 sec	8.73 KB
No (Comments						

QUESTION 2



Score 70

Points on a line? > Coding

QUESTION DESCRIPTION

Given an array of points in a two dimensional space, find out if all of the points lie on a line?

e.g., both arrayOfPoints = [(0,1), (1,2), (3,4), (3.5,4.5)] and arrayOfPoints = [(-6,-1), (-5,-2), (-4,-3), (-2,-5), (-1,-6)] contains points that lie on a line.

Constraints: Assume that points are already sorted by increasing order of their x coordinate.

Hint: This has something to do with 1st derivative, or the difference between consecutive points of arrayOfPoints.

Sample Test Case:

```
4 // total number of points
0 // x coordinate of 1st point
1 // y coordinate of 1st point
1 // x coordinate of 2nd point
2 // y coordinate of 2nd point
3 // x coordinate of 3rd point
4 // y coordinate of 3rd point
3.5 // x coordinate of 4th point
4.5 // y coordinate of 4th point
```

INTERVIEWER GUIDELINES

```
bool isLine(vector<Point> arrayOfPoints) {
// use arrayOfPoints[i].x to access x coordinate of ith point
// use arrayOfPoints[i].y to access y coordinate of ith point
int length = arrayOfPoints.size(); // length is the total number of points inside arrayOfPoints
float dydx = (arrayOfPoints[1].y-arrayOfPoints[0].y)/(arrayOfPoints[1].x-arrayOfPoints[0].x);
for (int i = 1; i < length; i++)
{
    float newdydx = (arrayOfPoints[i].y-arrayOfPoints[i-1].y)/(arrayOfPoints[i].x-arrayOfPoints[i-1].x);
    if (newdydx!=dydx)
        return false;
}
return true;
}</pre>
```

CANDIDATE ANSWER

Language used: C++

```
1
2 #include <cmath>
```

```
bool isLine(vector<Point> arrayOfPoints)
   // use arrayOfPoints[i].x to access x coordinate of ith point
   // use arrayOfPoints[i].y to access y coordinate of ith point
       int length = arrayOfPoints.size(); // length is the total number of
   points inside arrayOfPoints
      float dy;
      float dx;
       float gradient , slope;
       dy = arrayOfPoints[1].y - arrayOfPoints[0].y;
       dx = arrayOfPoints[1].x - arrayOfPoints[0].x;
       gradient = dy / dx ;
       for (int i = 0; i < length - 1; i++)
           dy = arrayOfPoints[i+1].y - arrayOfPoints[i].y;
           dx = arrayOfPoints[i+1].x - arrayOfPoints[i].x;
           slope = dy / dx;
           if (slope != gradient)
               return false;
           }
       return true;
27 }
```

TESTCASE	DIFFICULTY	TYPE	STATUS	SCORE	TIME TAKEN	MEMORY USED
Testcase 0	Easy	Sample case	Success	10	0.0446 sec	8.75 KB
Testcase 1	Easy	Sample case	Success	10	0.0566 sec	8.94 KB
Testcase 2	Medium	Hidden case	Success	10	0.0461 sec	8.82 KB
Testcase 3	Hard	Hidden case	Success	10	0.0457 sec	8.79 KB
Testcase 4	Hard	Hidden case	Success	10	0.0305 sec	9.01 KB
Testcase 5	Hard	Hidden case	Success	10	0.0409 sec	8.96 KB
Testcase 6	Easy	Hidden case	Success	10	0.0366 sec	8.87 KB

No Comments

QUESTION 3



Score 30

Bad Intern > Coding

QUESTION DESCRIPTION

An intern at the bio lab you work at is not the most motivated and often makes errors. They are supposed to send you genome sequences which are the results of certain ongoing experiments. A correct genome sequence is a string consisting only of the letters *A C G T*. Yet, you have received sequences from your intern that contained other characters or lower case characters.

You want to write a program to correct the received sequence as follows. A lower case *a c g t* is converted to upper case. All other characters are omitted.

Function Description

Write a function that takes two strings as parameters. The first is the potentially bad sequence. The second is where you will save the corrected sequence.

▼ Input Format For Custom Testing

The input is a single line containing the potentially bad sequence.

▼ Sample Case 0

Sample Input For Custom Testing

AGCTAGCT

Sample Output

AGCTAGCT

Explanation

There was no error in the input sequence.

▼ Sample Case 1

Sample Input For Custom Testing

AgCTAGCTqAGTCCGA 3gATC

Sample Output

AGCTAGCTAGTCCGAGATC

Explanation

The input sequence has been corrected.

INTERVIEWER GUIDELINES

Solution

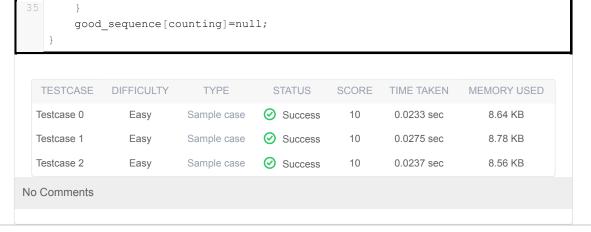
```
#include <iostream>
// Return the length of string.
int string length(char string[]) {
 // The length is the number of characters in the string before '\0'.
 int i = 0;
 while (string[i] != '\setminus 0') {
   i++;
 }
 return i;
// Store a corrected copy of bad sequence in good sequence.
void fix sequence(char bad sequence[], char good sequence[]) {
 int idx = 0; // Index in good sequence.
 bool valid letter = true; // Is current letter in bad sequence valid?
 for (int i = 0; bad_sequence[i] != '\0'; i++) {
    // Copy valid letters from bad sequence to good sequence.
   valid letter = true;
   switch (bad sequence[i]) {
   case 'a':
   case 'A':
     good sequence[idx] = 'A';
     break;
    case 'g':
    case 'G':
     good sequence[idx] = 'G';
     break;
    case 't':
    case 'T':
     good_sequence[idx] = 'T';
     break;
    case 'c':
    case 'C':
     good sequence[idx] = 'C';
     break;
    default:
```

```
valid letter = false;
    if (valid letter) {
     idx++;
  // Terminate good sequence.
  good sequence[idx] = '\0';
int main(int argc, char** argv) {
 // Allocate sufficient space for the input sequence, take input.
 // length.
 char input sequence[1000];
 std::cin.get(input sequence, 1000);
 // Create a new string of the same length as the input sequence and
store the
 // correct sequence in the new string.
 char correct sequence[string length(input sequence)];
 fix_sequence(input_sequence, correct_sequence);
 std::cout << correct_sequence;</pre>
 return 0;
```

CANDIDATE ANSWER

Language used: C++

```
* Complete the 'fix sequence' function below.
   * The function accepts following parameters:
6 * 1. CHARACTER ARRAY bad sequence
7 * 2. CHARACTER ARRAY good sequence
void fix sequence(char bad sequence[], char good sequence[]) {
     int ASCII;
     int counting=0;
     char null='\0';
     for (int i;i<1000;i++) {
         if (bad_sequence[i]=='A' || bad_sequence[i]=='C' ||
17 bad sequence[i] == 'G' || bad sequence[i] == 'T') {
              good sequence[counting]=bad sequence[i];
              counting++;
          else if (bad_sequence[i]=='a' || bad_sequence[i]=='c' ||
22 bad sequence[i]=='g' || bad sequence[i]=='t'){
             ASCII=int(bad_sequence[i])-32;
              good sequence[counting]=char(ASCII);
              counting++;
         //null value
         else if (bad sequence[i] == null) {
             break;
          }
          else
              counting=counting;
34
```



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