7Vals Coding Test

Dev Test 1 2024 C++
Badges
Competencies

Dashboard
Site home
Calendar
Private files
My courses
   sqa-2024
   Dev Test 1 2024 Java
Dev Test 1 2024 C++

Question 9
Complete
Marked out of 2.00
⚑ Flag question

Given the preorder traversal of a binary search tree as 30, 20, 10, 15, 25, 23, 39, 35, 42, identify the correct postorder traversal sequence for the same tree.

Select one:
- a. 15, 20, 10, 23, 25, 42, 35, 39, 30
- b. 15, 10, 25, 23, 20, 42, 35, 39, 30
- c. 15, 10, 23, 25, 20, 35, 42, 39, 30
- d. 15, 20, 10, 23, 25, 42, 35, 39, 30
- e. 30, 20, 10, 15, 25, 23, 39, 35, 42

Your response has been recorded.

Question 10
Complete
Marked out of 2.00
⚑ Flag question

What's the computational complexity of the following function?

```
int calculateOperations(int size) {
    int totalOperations = 0;
    for (int currentSize = size; currentSize > 0; currentSize /= 2) {
        for (int operations = 0; operations < currentSize; operations++) {
            totalOperations += 1;
        }
    }
    return totalOperations;
}
```

Select one:
- a. O(n*log(n))
- b. O(n²)

Dev Test 1 2024 C++
Badges
Competencies

Dashboard
Site home
Calendar
Private files
My courses
   sqa-2024
   Dev Test 1 2024 Java
Dev Test 1 2024 C++

Question 11
Complete
Marked out of 2.00
⚑ Flag question

From the provided choices, which one correctly arranges the functions f1, f2, f3, and f4 in order of their asymptotic growth from highest to lowest?

```
f1(n) = 2n
f2(n) = n^(3/2)
f3(n) = n^log(n)
f4(n) = nlog(n)
```

Lightshot   ⋯   ✕

Lightshot
Screenshot is saved to Screenshot_1.png. Click here to open in the folder.

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Question 11

Complete

Marked out of 2.00

⚐ Flag question

From the provided choices, which one correctly arranges the functions f1, f2, f3, and f4 in order of their asymptotic growth from highest to lowest?

```
f1(n) = 2n
f2(n) = n^(3/2)
f3(n) = n^log(n)
f4(n) = nlog(n)
```

Select one:
- ⦿ a. f2, f3, f1, f4
- ○ b. f3, f2, f1, f4
- ○ c. f2, f3, f4, f1
- ○ d. f3, f2, f4, f1

Your response has been recorded.

Question 12

Complete

Marked out of 2.00

⚐ Flag question

Given the modified sequence of operations on an empty stack and an empty queue, let's update the values for the operations and calculate the sum of the final values obtained from both the stack and the queue.

Stack Operations:

1. Push the number **65** onto the stack.
2. Push the number **58** onto the stack.
3. Pop the top element from the stack.
4. Push the number **60** onto the stack.
5. Push the number **70** onto the stack.
6. Pop the top element from the stack and assign it to a variable **s**.

Queue Operations:

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Queue Operations:

1. Enqueue the number **25** into the queue.
2. Enqueue the number **30** into the queue.
3. Dequeue the front element from the queue.
4. Enqueue the number **35** into the queue.
5. Enqueue the number **40** into the queue.
6. Dequeue the front element from the queue and assign it to a variable **q**.

What is the value of **s + q** after performing the above operations?

Select one:
- ○ a. 90
- ⦿ b. 100
- ○ c. 76
- ○ d. 95
- ○ e. 105

Your response has been recorded.

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Question 13

Complete

Marked out of 2.00

Flag question

Given the array: [23,32,45,69,73,89,97], which of the listed sorting algorithms requires the minimum number of element comparisons to arrange the array in an ascending order?

Select one:

- a. Quicksort using the last element as pivot
- b. Insertion sort
- c. Selection sort
- d. Merge sort

Your response has been recorded.

Question 14

Partially correct

Marked out of 25.00

Flag question

The Equilibrium Index

Given an integer array nums, determine if there exists an index i for which the sum of the elements to the left of i is equal to the sum of the elements to the right of i. If such an index exists, return true; otherwise, return false.

Example 1:

- **Input:** `nums = [1, 2, 3, 4, 6]`
- **Output:** `true`
- **Explanation:** The equilibrium index is at index 3 (0-based indexing), where the sum of the first three elements (1+2+3 = 6) is equal to the sum of the last element (6).

Example 2:

- **Input:** `nums = [4, 1, 7, 3, 5, 6, 2]`
- **Output:** `false`
- **Explanation:** No index satisfies the condition for an equilibrium index after correctly applying the algorithm.

Note on Using Vectors: In C++, `std::vector` is a versatile container that allows us to store a dynamic number of items. Unlike static arrays, vectors can grow and shrink in size. You can access elements of a vector just like an array using `nums[i]`, where `nums` is the name of your vector, and `i` is the index of the element you want to access. The `size()` function tells us how many elements the vector currently holds. For example, `nums.size()` returns the size of the `nums` vector.

Answer: (penalty regime: 0 %)

```cpp
#include <vector>

int calculate_sum(const std::vector<int>& nums,int start, int end){
    int s = nums.size();
    if(end<0 || start>= s)
        return 0;
    int sum = 0;
    for(int i= start;i<=end;i++){
        sum = sum+nums[i];
    }
    return sum;
}
bool hasEquilibriumIndex(const std::vector<int>& nums) {
    // your solution here
    int s = nums.size();
```

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Question **15**

Correct

Marked out of 30.00

⚑ Flag question

Circular Shift Palindrome

Given a string s, determine if it's possible to rotate (circular shift) s to form a palindrome. Return true if at least one rotation can result in a palindrome, otherwise return false.

Example 1:

- Input: s = "bbaa"
- Output: true
- Explanation: Rotating the string once results in "abba", which is a palindrome.

Example 2:

- Input: s = "abcd"
- Output: false
- Explanation: No rotation of "abcd" results in a palindrome.

This problem tests string manipulation and understanding of palindrome properties in a rotated context.

Answer: (penalty regime: 0 %)

```
1  #include <iostream>
2  #include <string>
3  using namespace std;
4
5  string circular_rotate_str(string s, int str_size){
6      char temp = s[str_size-1];
7      for(int i=str_size-1;i>0;i-- ){
8          s[i] = s[i-1];
9      }
10     s[0] = temp;
11     return s;
```

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Question **16**

Partially correct

Marked out of 35.00

⚑ Flag question

In a school, there are `n` students standing in a line, each with a unique talent. To reward them, the school has decided to distribute candies based on a combination of each student's academic rating and their participation weight in extracurricular activities. Each student is assigned a rating value given in the integer array `ratings` and a weight for their participation given in the integer array `weights`.

Your task is to distribute candies to these students subject to the following requirements:

1. Each student must receive at least one candy.
2. A student must receive more candies than their immediate neighbors if their combined score (calculated as the product of their rating and weight) is higher.

Objective:

Determine the minimum number of candies you need to distribute to the students, ensuring that the distribution adheres to the above requirements.

Input:

- `ratings[]` : An array of integers representing the academic ratings of each student.
- `weights[]` : An array of integers representing the participation weights of each student.
- `n` : The number of students.

Output:

- The minimum number of candies required to be distributed according to the rules.

Example:

- **Input:**
  - `ratings = [4, 1, 5, 2, 6, 3, 7, 2]`
  - `weights = [2, 3, 1, 5, 2, 4, 1, 3]`
- **Output:** `18`
- **Explanation:** The combined scores for the students are `[8, 3, 5, 10, 12, 12, 7, 6]`. To satisfy the distribution requirements while minimizing the total number of candies, a careful allocation based on these combined scores results in a total of 18 candies being required.

Dev Test 1 2024 C++

Badges

Competencies

Dashboard

Site home

Calendar

Private files

My courses

sqa-2024

Dev Test 1 2024 Java

Dev Test 1 2024 C++

Determine the minimum number of candies you need to distribute to the students, ensuring that the distribution adheres to the above requirements.

Input:

- `ratings[]` : An array of integers representing the academic ratings of each student.
- `weights[]` : An array of integers representing the participation weights of each student.
- `n` : The number of students.

Output:

- The minimum number of candies required to be distributed according to the rules.

Example:

- **Input:**
  - `ratings = [4, 1, 5, 2, 6, 3, 7, 2]`
  - `weights = [2, 3, 1, 5, 2, 4, 1, 3]`
- **Output:** `18`
- **Explanation:** The combined scores for the students are `[8, 3, 5, 10, 12, 12, 7, 6]` . To satisfy the distribution requirements while minimizing the total number of candies, a careful allocation based on these combined scores results in a total of 18 candies being required.

Constraints:

- `1 <= n <= 10^4`
- `0 <= ratings[i], weights[i] <= 10^4`

Answer: (penalty regime: 0 %)

```
1  const int MAX_STUDENTS = 10000; // This is based on the problem's constraints
2
3  int calculateMinCandies(const int ratings[], const int weights[], int n) {
4      // your solution here
5      int combined_score[n];
6      for(int i=0; i<n;i++){
```