L3 : Time Space Complexity Practice Questions

1-Tut : Linear Search Worst Case

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The Worst case(s) occur in linear search algorithm when -

Options

This problem may have one or more correct answers

Item is somewhere in the middle of the array
Item is the last element in the array
Item is present at the first index of the array.
Item is not in the array at all

Correct Answer : B , D

2-Tut : Worst Case Time Complexity of Insertion sort

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Worst case time complexity of insertion sort is ?

Options

This problem may have one or more correct answers

O(N)
O(N^2)
O(NLogN)
O(LogN)

Correct Answer : B

3-Tut : Worst Case Time complexity of Selection Sort

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Worst case time complexity of Selection sort is ?

Options

This problem has only one correct answer

O(N)
O(N^2)
O(NLogN)
O(LogN)

Correct Answer : B

4-Tut : Efficiency of an Algorithm

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Two main measures for the efficiency of an algorithm are -

Options

This problem may have one or more correct answers

Processor and memory
Complexity and capacity
Time and space
Data and space

Correct Answer : C

5-Tut : Theoretical Analysis

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In theoretical analysis the time factor when determining the efficiency of algorithm is measured by -

Options

This problem may have one or more correct answers

Counting microseconds
Counting the number of statements in code
Counting the number of unit operations
Counting the kilobytes of algorithm

Correct Answer; C

6-Tut : Time Complexity

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If the number of primary operations of an algorithm that takes an array of size n as input are 3n^2 + 5n.

The worst case time complexity of the algorithm will be ?

Options

This problem may have one or more correct answers

O(n^3)
O((n^2)*logn)
O(n^2)
O(n)

Correct Answer : C

7-Tut : Time Complexity of Code

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What will be the Time Complexity of the following code in terms of ‘n’ ?

Refer the code for C++ -

```
for(int i = 0; i < n; i++){
    for(; i < n; i++){
        cout << i << endl;
    }
}
```

Refer the same code in Java -

```
for(int i = 0; i < n; i++){
   for(; i < n; i++){
      System.out.println(i);
   }
}
```

Refer the same code in Python -

```
  i = 0
   while i<n :
        while i<n :
            print(i)

            i += 1
```

Options

This problem may have one or more correct answers

O(n)
O(n^2)
O(logn)
O(nlogn)

Correct Answer : A

8-Tut : Time Complexity of Code

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What will be the Time Complexity of the following code in terms of ‘n’ ?

Note : Assume k to be a constant value

Refer the code in C++ -

```
 for(int i = 0; i < n; i++){
    for(int j = 1 ; j < k; j++){
       cout << (i + j ) << endl;
    }
 }
```

Refer the same code in Java -

```
for(int i = 0; i < n; i++){
      for(int j = 1 ; j < k; j++){
        System.out.println(i + j);
      }
}
```

Refer the same code in Python -

```
for i in range(n):
    for j in range(k):
        print(i+j)
```

Options

This problem may have one or more correct answers

O(n^2)
O(n)
O(logn)
None of these

Correct Answer : B

9-Tut : Operations for merging

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For merging two sorted arrays of size m and n into a sorted array of size m+n, we require operations -

Options

This problem has only one correct answer

O(m * n)
O(m + n)
O(m) if m >= n
O(n) if n > m

Correct Answer : B

10-Tut : Worst Case Time complexity of Binary Search

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Worst case time complexity of Binary Search is ?

Options

This problem has only one correct answer

O(N)
O(N^2)
O(NLogN)
O(LogN)

Correct Answer : D

11-Tut : Recurrence for Merge Sort

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What is the recurrence relation for merge sort :

Options

This problem has only one correct answer

T(n) = 2T(n/2)
T(n) = 2T(n/2) + k
T(n) = 2T(n/2) + O(n)
T(n) = 2T(n/2) + O(log n)

Correct Answer : C

12-Tut : Merge sort

Send Feedback

What is the time complexity of merge sort :

Options

This problem has only one correct answer

O(n)
O(n^2)
O(nlogn)
O(log n)

Correct Answer : C

13-Tut : What is time complexity

Send Feedback

What is the time complexity of following code ?

```
int multiplyRec(int m, int n){
    if(n == 1)
        return m;
    return m + multiplyRec(m,  n - 1);
}
```

Options

This problem has only one correct answer

O(m*n)
O(n)
O(n^2)
O(m)

Correct Answer : B

14-Tut : What is time complexity

Send Feedback

What is the time complexity of following code ?

```
int sumOfDigits(int n){
        int sum;
        if(n < 10){
            return n;
        }
```

```
        sum = (n % 10) + sumOfDigits(n / 10);
        return sum;
}
```

Options

This problem has only one correct answer

O(logn) - log is to the base 10
O(n)
O(n^2)
None of these

Correct Answer : A

15-Tut : Fibonacci

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What is the time complexity of following code for calculating nth fibonacci number

```
long fib(int n){
   if(n == 0 || n == 1){
        return n;
   }
   return fib(n - 1) + fib(n - 2);

}
```

Options

This problem has only one correct answer

O(n)
O(n^2)
O(2^n)
O(n^3)

Correct Answer : C

16-Tut : Merge Sort space

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The space complexity for merge sort is :

Options

This problem has only one correct answer

O(n)
O(n^2)
O(nlogn)
O(log n)

Correct Answer : A

17-Tut : Fibonacci

Send Feedback

The space complexity for finding nth fibonacci number using recursion is :

Options

This problem has only one correct answer

O(n)
O(2^n)
O(log n)
O(n^2)
O(nlogn)

Correct Answer : A

Kadane’s Algorithm

1. https://www.codechef.com/problems/KCON
2.