

CS502 Quiz 1 File

CS502 QUIZ SOLUTION FILE

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If matrix A of dimension 2×4 is multiply with matrix B of dimension 4×3 , then the dimension of resultant matrix is:

2×3

Fibonacci Sequence was named on _____, a famous mathematician in 12th Century.

Leonardo Pisano

Chain matrix multiplication problem can be solved through ----- strategy.

Dynamic programming

Counting sort is suitable for sorting the elements within range 1 to P, where

P is small

The only way to convert a string of i characters into the empty string is with i deletions, represented as _____.

$E(i, 0) = i$

In Dynamic Programming approach, we do not store the solution to each sub-problem in case if it reappears.

True

If Matrix-A has dimensions " 3×2 " and Matrix-B has dimensions " 2×3 ", then multiplication of Matrix-A and Matrix-B will result a new Matrix-C having dimensions

3×3

Quicksort is a/an _____ and _____ sorting algorithm.

In-place, stable one

When matrix A of 5×3 is multiply with matrix B of 3×4 then the number of multiplication required is:

60

Memoization is a part of Dynamic Programming strategy.

True

If matrix A of dimension 2×4 is multiply with matrix B of dimension 4×3 , then the dimension of resultant matrix is:

2×3

Counting sort assumes that the numbers to be sorted are in the range

_____.

1 to k where k is small

When matrix A of 5×3 is multiply with matrix B of 3×4 then the number of multiplication required is:

60

If matrix A of dimension $p \times q$ is multiply with matrix B of dimension $q \times r$, then each entry in resultant matrix takes ----- time.

$O(q)$

Memoization is a part of Dynamic Programming strategy.

True

An in-place sorting algorithm is one that _____ uses additional array for storage.

Does not

When a recursive algorithm revisits the same problem over and over again, we say that the optimization problem has _____ sub-problems.

Overlapping

If a matrix has three rows and two columns, then dimensions of matrix will be:

3×2

Multiplication is _____.

n^3 (n cube)

Heap sort is a/an _____ and _____ sorting algorithm.

In-place, not stable one

In generating Fibonacci Sequence, we can avoid unnecessary repetitions by _____ process.

Memoization Not memorization

In Dynamic Programming approach, solution is modified/changed

_____.

At each stage

Counting sort is suitable for sorting the elements within range 1 to P, where

_____.

P is small

_____ overcomes the limitations of _____ by working as per positional notations of numbers.

Radix sort, Counting sort

In Dynamic Programming, our approach is to _____.

Build the solution in a bottom-up fashion

If matrix A of dimension 2 x 4 is multiply with matrix B of dimension 4 x 3, then the dimension of resultant matrix is:

2 x 3

Insertion sort is an in-place sorting algorithm.

True

If Matrix-A has dimensions "3x2" and Matrix-B has dimensions "2x3", then multiplication of Matrix-A and Matrix-B will result a new Matrix-C having dimensions

3x3

Matrix multiplication is a(n) ----- operation.

Associative

Identify the TRUE statement.

The Knapsack problem belongs to the domain of optimization problems.

If there are $\Theta(n^2)$ entries in edit distance matrix then the total running time is:

$\Theta(n^2)$

Consider three matrices X, Y, Z of dimensions 1 x 2 , 2 x 3 , 3 x 4 respectively.

The number of multiplications of (XY)Z is:

18

In Knapsack Problem, the goal is to put items in the knapsack such that the value of the items is _____ subject to weight limit of knapsack.

Maximized

Radix sort is not a non-comparative integer sorting algorithm.

True

We can multiply two matrices A and B only when they are compatible which means:

Number of columns in A must be equal to number of rows in B

Dynamic Programming comprises of _____

No Repetition but Recursion

Following is not the application of Edit Distance problem.

Ascending Sort

Consider three matrices X, Y, Z of dimensions 1×2 , 2×3 , 3×4 respectively. The number of multiplications of $X(YZ)$ is:

32

In Bucket sort, if there are duplicates then each bin can be replaced by a

Linked list

There are _____ entries in the Edit Distance Matrix.

$\Theta(n^2)$

Heap sort is a/an _____ and _____ sorting algorithm.

In-place, not stable one

In Brute Force solution of Knapsack Problem, there are _____ possible combinations for n items.

2^n (2 raise to the power n)

We can make _____ recursive calls in Fibonacci Sequence.

Infinite

In Fibonacci Sequence, each term is calculated by _____ previous _____ terms.

Adding, Two

A sorting algorithm is called as _____ if duplicate elements remain in the same relative position after sorting.

Stable

As per algorithm of Dynamic Programing, we need to store the result(s) of _____

Intermediate sub-problems

Dynamic Programming is a problem-solving approach in which _____

Both are incorrect

The only way to convert an empty string into a string of j characters is by doing j insertions, represented as _____.

$E(0, j) = j$

Dynamic Programming approach is usually useful in solving optimization problems.

True

It is not a Fibonacci Sequence.

1,1,1,2,3,5,8,13,21,34,55,.....

TRUE

Dynamic programming formulation of the matrix chain multiplication problem will store the solutions of each sub problem in $a(n)$:

Table

We can use the optimal substructure property to devise a _____ formulation of the edit distance problem.

Recursive

. If we associate (x,y) integer pare to cars where x is the speed of the car and y is the negation of the price. High y value for a car means a-----car.

Cheep

2. We can use the optimal substructure property to devise a ____ formulation of the edit distance problem. recursive
3. In average- case time analysis of quick sort algorithm. The most balanced case for partition is when we divide the list of element into -----.

Three nearly equal pieces

4. Counting sort assumes that the number to be sorted are in the range -----

1 to k where k is small

5. In random access machine(RAM) instructions are executed in _____

One by one

6. Brute-force algorithm for 2D-maxima is operated by comparing _____pairs of point All

7. A sorting algorithm is called as _____ if duplicate elements remain in the same relative position after sorting.

Stable

8. An algorithm is said to be correct if for every _____ instance , it halts with the correct **Input, output**

9. The O- notation is used to state only the asymptotic_____ bounds.

Upper

10. Insertion sort is an efficient algorithm for sorting a _____number of elements.

Large

11. Dynamic programming formulation of the matrix chain multiplication problem will store the solution of each sub problem in a(n).

Table

12. Dynamic programming strategy is useful when sub problems are independent.

True

13. In 3- dimensional space ,a point P has_____ coordinate(s).

X,Y,Z

14. In plane sweep approach, a vertical line is swept across the 2D-plane from_____.

Left to right

15. If there are $\Theta(n^2)$ entries in edit distance matrix then each entry $E(i, j)$ takes_____ time to complete.

$\Theta(1)$

16. The only way to convert an empty string into a string of J characters is by doing insertions , represented as_____

$E(0, j) = j$

17. Merge sort have running time_____ running time of heap sort.

Less than

18. Fibonacci sequence was named on ____ a famous mathematician in 12th century.

Leonardo Pisano

19. In Fibonacci sequence, each term is calculated by_____ previous _____term.

Adding, two

20. Selection sort is not an place sorting algorithm.

False

In plane sweep approach, a vertical line is swept across the 2d-plane and _____ structure is used for holding the maximal points lying to the left of the sweep line.

STACK

1. In _____ we have to find rank of an element from giving input.

Selection problem

2. AL khawarizmi was a/an
Mathematician

3. While sorting the ordered domain means for any two input elements x and y
_____ satisfies only.

All of the above

4. When a recursive algorithm revisits the same problem over and over again, we say that the optimization problem has _____ sub-problems.

Overlapping

5. In sieve technique, we solve the problem _____

In recursive manner

6. The time assumed for each basic operation to execute on RAM Model of computation is

Constant

7. Heap sort is a/an _____ and _____ sorting algorithm.

In-place, not stable one

8. Algorithm is a sequence of computational steps that _____ input into output. **Transform**

9. If matrix-A has dimension 3×2 and matrix-B has 2×3 , then resultant matrix will be 3×3
10. ____ provides more accurate result when input values are not closer to each other **Median**
11. Boolean operation is a ____ operation on an idealized RAM model of computation. **Basic**
12. In order to say anything meaningful about our algorithms, it will be important for us to settle on a ____
Mathematical model of computation
13. In average-case time analysis of quick sort algorithm, the most balanced case for partition is when we divide the list of elements into ____
Three nearly equal pieces
14. An algorithm is a mathematical entity, which is independent of ____
Programming language, compiler and machine
15. In dynamic programming based solution of knapsack problem, to compute entries of “V”, we will imply a(n) ____ approach.
Inductive
16. In selection algorithm, we assume pivot selection takes theta ____
running time **n**
17. If input “n” is odd, the median will be ____
 $(N+1)/2$
18. The asymptotic growth of $(N+1)/2$ is
 $O(n^2)$
19. In generating Fibonacci sequence, we can avoid unnecessary repetitions by ____ process.

Memoization

- 1) In selection problem, the sieve technique works in-----

Ans: Phases

(pg#34)

- 2) If a matrix has three rows and two columns, then dimensions of matrix will be:

Ans: 3×2

(Dimensions of matrix =

row $\times$ column)

- 3) When a heapify procedure is applied to the root node to restore the heap, then at each level, the comparison performed takes time:

Ans: it will take $\Theta(1)$

(pg#43)

- 4) If there are $\Theta(n^2)$ entries in edit distance matrix then the total running time is: **Ans: $\Theta(n^2)$**

(pg#84)

- 5) The O-notation is used to state only the asymptotic----- Bounds.

Ans: upper

(pg#25)

- 6) The worst-case running time of Quick sort is----- in order to sort an array of n element.

Ans: $\Theta(n)$

(pg#49)

- 7) The omega-notation allows us to state only the asymptotic----- -- bounds. **Ans: Lower**

(pg#25)

- 8) Dynamic programming formulation of the matrix chain multiplication problem will store the solution of each sub problem in a(n): **Ans: (Table)**

(pg#86)

- 9) If the time complexity of an algorithm is given by $O(1)$, then time complexity would be:

Ans: Constant

(pg#26)

- 10) Which of the following is calculated with big O notation? **Ans : Upper Bounds**

(pg#25)

- 11) Insertion sort is an efficient algorithm for sorting a----- number of elements.

Ans: Large

(pg#39)

- 12) Chain matrix multiplication problem can be solved through----- strategy. **Ans: Dynamic programming**

(pg#85)

13) In recursive formulation of Knapsack Problem:

$V[0..j] = \text{-----}$ for $j \geq 0$

Ans: 0 (pg#93)

- 14) For ----- values of n , any algorithm is fast enough. Ans: small (pg#14)

15)

Counting sort is suitable to sort the elements in range 1 to k : Ans: k is small (pg#57)

- 16) Quick sort ----- based on Divide and conquer strategy.

Ans always (pg#46)

- 17) In the statement “if $(P[i].x < P[j].x) \& (P[i].y < P[j].y)$ ” the number of times elements of P are accessed is-----

Ans: 4 (pg#14)

- 18) ----- overcome the limitation of ----- by working as per positional notations of numbers.

Radix sort, Counting sort (pg#71)

- 19) While sorting, the ordered domain means for any two input elements x and y ----- satisfy only.

Ans: All given ($x < y$, $x > y$, $x = y$) (pg#39)

- 20) We can improve the performance of Quick sort if we can be able to----- Ans: Skip any sub-array completely (google search, not found in book)

- 21) Pseudo code of algorithms to be read by----- Ans : People (pg#12)

- 22) In Heap Sort algorithm, the maximum levels an element can move up word

Ans $\Theta(\log n)$ (pg#43)

- 1) The time assumed for each basic operation to execute on RAM model of computation is : -----

Ans : Constant (pg#10)

2) The definition of Theta-notation relies on proving ----- asymptotic bounds.

Ans: Both lower and upper (pg#25)

3) In asymptotical analysis of $n(n-3)$ and $4n*n$, as n becomes large, the dominant(fastest growing) term is some constant times-----

Ans : $n*n$ (pg#23)

4) ----- items are not allowed in the 0/1 knapsack.

Ans : fractional (pg#91)

5) We can improve the performance of Quick Sort if we can be able to-----

Ans : Skip any sub-array completely (Repeat)

6) In Quick Sort algorithm, Pivots form-----

Ans: Binary Search Tree (pg#49)

7) An in-place sorting algorithm is one that ----- uses additional array for storage.

Ans: Does not (pg#54)

8) The running time of Quick sort algorithm -----

Ans: Greatly influenced by the Selection of pivot (pg#49)

