Course ID: CS 501
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Description:
http://npu85.npu.edu/~henry/npu/classes/algorithm/geeksforgeeks/slide/exercise_geeksfor
geeks.html
Q32 ==> Please use Substitution method to find Big-O of this recursion

http://npu85.npu.edu/~henry/npu/classes/algorithm/divide_and_conquer/slide/exercise_di
vide_and_conquer.html
Q8 ==> Please use Mater Theroem to analyze the following recurrence

http://npu85.npu.edu/~henry/npu/classes/algorithm/tutorialpoints_daa/slide/exercise_tutor
ialspoint.html
Q5 ==> Please draw a diagram to show the search of 76 from the following numbers
using Binary Search

http://npu85.npu.edu/~henry/npu/classes/algorithm/tutorialpoints_dsa/slide/exercise_tutor
ialspoint.html
Q10 ==> Please draw a diagram to show the Merge Sort of these numbers

32. Please use Substitution method to find Big-O of this recursion

```
T(n)  = 0                    if n = 1
T(n)  = T(n-1)  + n - 1   if n ≥ 2
```

Answer:
T(n) = T(n-1) + n - 1
    = T(n-2) + (n-1) + (n-2)
    = T(n-3) + (n-1) + (n-2) +(n-3)
    ……
    = T(n- (n-1))+ (n-1) + (n-2) +(n-3)+…
    =T(1) + (n-1) + (n-2) +(n-3)+…1
    =n(n-1)/2
    =(n^2 – n)/2
O(n) = O (n^2).

8. Please use Mater Theroem to analyze the following recursion:

```
T(n)  = 7* T * (n/2)  + 500 * n²
```

Answer:
a = 7; b = 2; f(n) = 500 * n^2 ; d = 2;
a > b^d;

so, T(n) = 0 (n ^log2^7)

5. Please draw a diagram to show the search of 76 from the following numbers
using Binary Serch

6 12 28 29 45 54 62 76

<u>6 12 28 29</u>   <u>45 54 62 76</u>
Not here

          <u>45 54</u>   <u>62 76</u>
            Not

                <u>62</u>   <u>76</u>
              Not   yes!

10. Please draw a diagram to show the Merge Sort of these numbers
34 13 20 15 43 44 19 23

<u>34 13 20 15</u>   <u>43 44 19 23</u>

<u>34 13 20 15</u>   <u>43 44 19 23</u>

<u>34 13</u>   <u>20 15</u>   <u>43 44</u>   <u>19 23</u>

34   13   20   15   43   44   19   23

<u>13   34</u>   <u>15   20</u>   <u>43   44</u>   <u>19   23</u>

<u>13 15   20   34</u>   <u>19   23   43   44</u>

<u>13 15   19   20   23   34   43   44</u>