**Lab 3**



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**Problem 1:**

**(a):**

First argument is right as we have done Karatsuba’s Algorithm in base 2 and base 16 (Hexadecimal)

**(b):**

Yes, second argument is also true. By increasing the base of number, the length of number decreases

**(c):**

Third argument is false. As length of number increases, the time complexity does not remain constant

**Problem 2:**

**(a):**

**Pseudo Code:**

friendSlower(A)

1. lis =[ ]
2. con=1
3. row=1
4. col=2
5. for i in A:
6. col=row+1
7. for j in A[con:]:
8. If(i[1]>=j[0]:
9. Lis.append(tuple([row,col))
10. col=col+1
11. con=con+1
12. row=row+1
13. col=0
14. return lis

**Description:**

First make a List in which index will be append. Then make a variable count for second loop. Second loop index will started from first loop first index(first Loop=i , second Loop=i+1). Then make a two variables for required problem to determine row and column. In Every first loop iteration, will have 2d array elements in i and then compare it with next indexes. If required condition is true then present array indexes will append in the list as a tuple. After second loop, we increment row variable index and starting index of second loop. As in this algorithm we are using variables and two nested loops. We assume time complexity of variables be constant so time complexity of this algorithm is **n^2.**

**(b):**

**Pseudo Code:**