// Input: Base Salary, Bonus, Tax of the employee
// Output: Gross Salary, Net Salary.

Salary calc (Base Salary, Bonus, Tax)

HRA % = 50
DA % = 10
CA_amt = 1500
EPF % = 12
EST % = 0.75
~~Tax~~

HRA_amt = gross Salary * HRA % / 100
DA_amt = gross Salary * DA % / 100
EPF_amt = gross Salary * EPF % / 100
EST_amt = gross Salary * EST % / 100

Allowance = HRA_amt + DA_amt + CA_amt
Deduction = EPF_amt + EST_amt

Gross_Salary = Base Salary + Allowance + Bonus
tax_amt = Gross_Salary * tax / 100
net_salary = Gross Salary - deduction - tax amt
return Gross_Salary, net_salary

To find employee with maximum and minimum salary

// Input: array of ~~gross~~ Net Salary and start and end index

// output: maximum and minimum salary

```
If start == end ;
  Return (salary[start], salary[start]
mid = (start + end) / 2
(left_min, left_max) = Find (salary, start, mid)
(right_min, right_max) = Find (salary, mid+1, end)

min_salary = Min(left_min, right_min)
max_salary = Max(left_max, right_max)

Return (min_salary, max_salary)
```

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Time complexity Analysis

(A) Linear algorithm

Initialization — O(1)

list of n employees is given

For each employee you p

- compute gross and net salary
- Update min & max salary

$O(1) + O(1) = O(1)$

Total Time complexity for Traversing in list

$T_{traverse}(n) = n * O(1) = O(n)$

Total $= O(1) + O(n) + O(1) = O(n)$

(B) Divide and conquer Algorithm

Given list of 'n' employees

$T(n) = 2T(n/2) + O(n)$

Apply master's theorem

$a = 2$ (no of subproblems)

$b = 2$ (factor with which problem is divided)

$f(n) = O(n)$

$\log_b a = \log_2 2 = 1$

Compare $f(n)$ with $n^{\log_b a}$

$f(n) = O(n)$

$n^{\log_b a} = n^1 = n$

$\therefore f(n) = O(n)$

and the time complexity of both algorithm is $O(n)$.

Positive test cases.

(1) Input :

No.	Base Salary	Bonus	Tax Percent
1	54501	2000	9
2	62540	3000	7.5
:	:	:	:
2000	57412	5900	4

output : For employee 256 - Gross salary : 105323
Net salary : 88593
Minimum salary : 37690.5
Maximum salary : 170957

(2) Input :

No	Base Salary	Bonus	Tax percent
1	752410	5000	5
2	88000	4716	6.5
:	:	:	:
2000	53216	3217	7

output : for employee 25 : Gross salary : 45623
Net salary : 32543
Minimum salary : 38639.8
Maximum salary : 168635

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③

Input: No	Base Salary	Bonus	Tax percent
1	43217	0	6.5
2	56158	6751	4.25
:	:	:	:
2000	57215	5921	7

output : For employee 27 : Net salary : 88215
Gross salary : 75129

Minimum net salary : 43145
Maximum net salary : 120,799

④

Input NO	Base salary	Bonus	Tax percent
1	74340	5740	2
2	45640	0	7.2
:	:	:	:
2000	34219	0	8.5

output : for employee 357 - Net salary : 78953
Gross salary : 65215

Minimum salary : 34215
Maximum salary : 168259

⑤

Input: No	Base salary	Bonus	Tax percent
1	45215	5321	5
2	73219	2430	6
:	:	:	:
2000	83157	0	3

output : for employee 1999 - Net salary : 45612
Gross salary : 31258

Minimum salary : 45612
Maximum salary : 1,08,256

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Negative Test Cases –

① Invalid File operation
output : 'Unable to open file for reading.'

② If the data in file is negative
output : we filter negative value

③ if tax percent is zero
output – the tax amt will be zero so gross and net salary will be equal

④ if Basic salary is large value
output : overflow will be taken care of

⑤ ~~Large~~. Precision salaries
output : the precision of the salary should be taken care of using set precision function.