

## Income Tax Calculator

You are required to produce a solution for a Tax calculator. You may use any notation to represent your design, and code using Java.

Your design should assume that you are writing an enterprise scale application and should demonstrate your knowledge and understanding of object oriented design, design patterns, testing, scaling and software engineering principles. You should also indicate any third party frameworks or components that you have used in your implementation and its testing.

The solution to this exercise can be submitted via zip file (only containing source code), or via access to an online repository such as GitHub. The solution will be demonstrated via a screen share during interview.

### Background - Tax calculation

UK Income tax is calculated according to tax bands. Tax within each band is calculated based on the amount of the salary falling within a band. The total tax is the sum of the tax paid within all bands. Each band has an optional upper and mandatory lower limit and a percentage rate of tax. Tax bands will not overlap.

Each band takes its upper limit to be the lower limit of the next band. The tax band covering the upper part of the salary never has an upper limit. The uppermost tax band has a tax rate of 40%; this allows tax to be capped.

Sample data:

Tax Band	Annual Salary Range (£)	Tax Rate (%)
Tax Band A	0 - 5000	0
Tax Band B	5000 - 20000	20
Tax Band C	20000 +	40

Both the tax rate and limits are integer values. Tax is calculated based on the gross annual salary. (see "Examples of tax calculations"). Net salary is gross salary less tax. Monthly amounts are the annual amounts divided by 12.

### Specification

- You may use any type of user interface.
- You should assume the use of a relational database.
- You may use any open source libraries.

## User Interface

The wireframes below indicate the requirements for two simple screens.

Salary entry screen:

Gross Annual Salary:	<input type="text"/>	<input type="button" value="Calc"/>
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Results screen:

Gross Annual Salary:	<input type="text" value="40000"/>	<input type="button" value="Calc"/>
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Gross Annual Salary: £ 40000		
Gross Monthly Salary: £ 3333.33		
Net Annual Salary: £ 29000		
Net Monthly Salary: £ 2416.67		
Annual Tax Paid: £ 11000.00		
Monthly Tax Paid: £ 916.67		

## Examples of tax calculations

For salary: 10000 p.a.

Salary in Band A = 5000 => Tax paid =  $5000 \times 0\% = 0$

Salary in Band B = 5000 => Tax paid =  $5000 \times 20\% = 1000$

Salary in Band C = 0 => Tax paid =  $0 \times 40\% = 0$

=> Annual tax paid = 1000

For salary: 40000 p.a.

Salary in Band A = 5000 => Tax paid =  $5000 \times 0\% = 0$

Salary in Band B = 15000 => Tax paid =  $15000 \times 20\% = 3000$

Salary in Band C = 20000 => Tax paid =  $20000 \times 40\% = 8000$

=> Annual tax paid = 11000