Fundamental of Programming in C#

# Day 6 Quiz

You are asked to implement income tax calculator for Singapore. The tax rate table is given in Figure 1.

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| **No** | **Chargeable Income** | **Income Tax Rate (%)** | **Gross Tax Payable ($)** |
| 0 | First $20,000 | 0 | 0 |
|  | Next $10,000 | 2 | 200 |
| 1 | First $30,000 | - | 200 |
|  | Next $10,000 | 3.5 | 350 |
| 2 | First $40,000 | - | 550 |
|  | Next $40,000 | 7 | 2,800 |
| 3 | First $80,000 | - | 3,350 |
|  | Next $40,000 | 11.5 | 4,600 |
| 4 | First $120,000 | - | 7,950 |
|  | Next $ 40,000 | 15 | 6,000 |
| 5 | First $160,000 | - | 13,950 |
|  | Next $ 40,000 | 17 | 6,800 |
| 6 | First $200,000 | - | 20,750 |
|  | Next $120,000 | 18 | 21,600 |
| 7 | First $320,000 | - | 42,350 |
|  | Above $320,000 | 20 |

Figure 1. Singapore Resident Tax Rate (source: IRAS)

As an illustration, someone with $100,000 annual income will fall under the bracket no 3 and have to pay $3,350 for the first $80,000 of the taxable income and will be taxed at 11.5% for the remainder of the taxable income. The calculation would be 11.5% \* ($100,000 – $80,000) + $3,350 = $2,300 + $3,350 = $5,650.

You are asked to write the program in modular fashion by implementing the method as prescribed in the specification below.

**Specification of the methods**

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| ***Method Name*** | ***Description*** |
| Main (code given) | The main method should:   * Get the taxable income from the user * Get the tax bracket of the user * Calculate the taxable income based on the tax bracket * Print the result |
| AskForIncome | This method takes no argument and return an **integer** that contains the taxable annual income of the user. This method should:   * Prompt the user for annual taxable income.   “Please enter your annual taxable income: ”   * Return the entered income as an integer |
| GetTaxBracket | This method takes one argument: the annual income of the user and returns an integer that indicates the tax bracket index that the user belong to.  The logic for this method should be:   * Look for the **largest** index in the minIncome array where the minIncome is **smaller** than the annual income given * Return the largest index found * If the income is less than 20,000, no index would be found, return -1. |
| CalculateIncomeTax | This method takes two arguments:   * The annual income * The tax bracket index   And return the payable tax (use double data type for the payable tax)  The logic for this method should be:   * If the tax bracket index is -1, then no tax is payable. * Take the following values from the different arrays:   + Minimum income (from minIncomeArray)   + Tax rate (from taxRateArray)   + Base Payable Amount (from basePayableAmountArray) * Calculate the payable tax by using the formula:   Payable tax = (annual income – minimum income) \* tax Rate  + base payable amount   * Return the payable tax amount |
| PrintResult | The arguments for this method are:   * The taxable annual income * The payable tax amount   The console output of this method should match the sample output given. The income and tax amount should be formatted in currency format. |

The Main method for the program is given as displayed below:

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| using System;  namespace TaxCalculator  {  class Program  {  //these arrays is visible in all the static method,  //so you can use them in your method implementation  static int[] minIncomeArray = new int[]  { 20000, 30000, 40000, 80000,  120000, 160000, 200000, 320000 };  static double[] taxRateArray = new double[]  { 0.02, 0.035, 0.07, 0.115,  0.15, 0.17, 0.18, 0.20 };  static int[] basePayableAmountArray = new int[]  { 0, 200, 550, 3350,  7950, 13950, 20750, 42350 };  static void Main(string[] args)  {  int annualIncome = AskForIncome();  int taxBracket = GetTaxBracket(annualIncome);  double taxPayable =  CalculateIncomeTax(annualIncome, taxBracket);  PrintResult(annualIncome, taxPayable);  }  //YOUR CODE HERE  } |

## Sample outputs from multiple executions:

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| Please enter your annual taxable income: 100000  For taxable annual income of $100,000.00, the tax payable amount is $5,650.00  Please enter your annual taxable income: 0  For taxable annual income of $0.00, the tax payable amount is $0.00  Please enter your annual taxable income: 1000000  For taxable annual income of $1,000,000.00, the tax payable amount is $178,350.00 |

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