**Example 2 with Selection structure showing program development**

The annual tax that must be paid by the XYZ Paint Company is calculated as follows (P is the profit made by the company):

Profit(P) Tax Due

P<= 0 None

P<= $15000 20% of profit

$15000 < P <= $40000 20% of first $15000 + 35% of amount over

P > $40000 20% of first $15000 + 35% of next $25000 and 50% of the rest of the amount

Data that is available: annual income, annual expenses

Information required: Profit, tax owing

Use test data that will cover all possible combinations.

**Input**

|  |  |  |
| --- | --- | --- |
| ***name*** | ***type*** | ***availability*** |
| annualIncome | float | keyboard |
| annualExpenses | float | keyboard |

**Constants**

lowLimit 🡨 0

middleLimit 🡨 15000

upperLimit 🡨 40000

lowTaxRate 🡨 20%

middleTaxRate 🡨 35%

upperTaxRate 🡨 50%

**Output**

|  |  |  |
| --- | --- | --- |
| ***name*** | ***format*** | ***where*** |
| profit | two decimal places | screen |
| taxOwing | two decimal places | screen |

**Processing**

1. Decisions

If profit <= lowLimit taxOwing 🡨 None

Else if profit <= middleLimit taxOwing 🡨 lowTaxRate \* profit

Else if Profit <= upperLimit taxOwing 🡨lowTaxRate \* middleLimit +

middleTaxRate \* (profit – middleLimit)

else taxOwing 🡨 lowTaxRate \* middleLimit +

middleTaxRate \* (upperLimit – lowerLimit) +

upperTaxRate \* (profit – upperLimit)

1. Calculations

Profit 🡨 annualIncome - annualExpenses

**Test data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| annualIncome | 20000.00 | 20000.00 | 20000.00 | 20000.00 | 40000.00 | 50000.00 |
| annualExpenses | 30000.00 | 15000.00 | 5000.00 | 1000.00 | 0.00 | 5000.00 |
|  |  |  |  |  |  |  |
| profit | -10000.00 | 5000.00 | 15000.00 | 19000.00 | 40000.00 | 45000.00 |
| taxOwing | 0.00 | 1000.00 | 3000.00 | 1400.00 | 11750.00 | 14250.00 |

**Testing Plan**

Version 1: Enter data: annualIncome, annualExpenses

Version 2: Processing: calculate profit

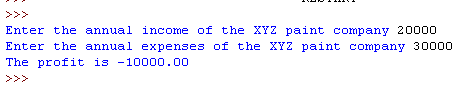
Version 3: Calculate taxOwing as per decisions above

Version 4: Improve Display profit and taxOwing

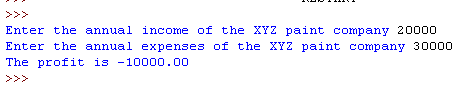
**Coding and testing**

Version 1

Data entered correctly with no syntax errors

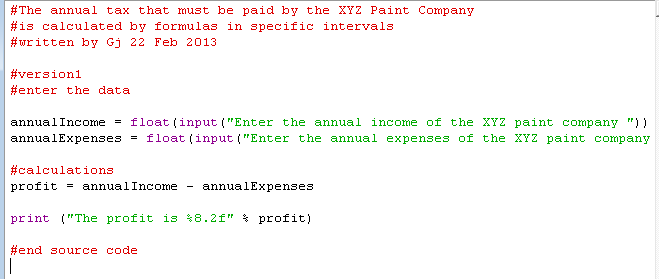


Version2



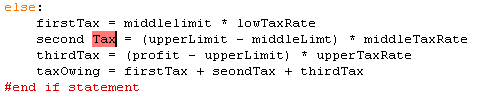
Output is correct so far

Code for version 2

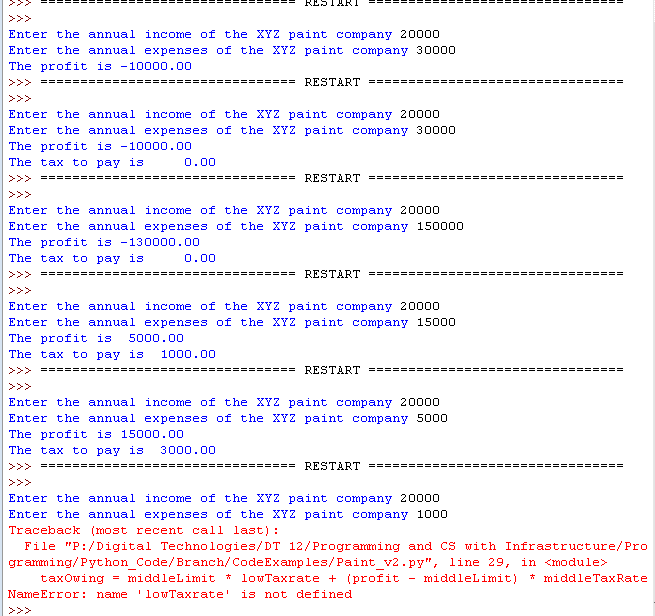


Version 3





Incorrect variable

typing error again!!