Design, develop, code and run the program in any suitable language to solve the commission problem. Analyse it from the perspective of boundary value testing, derive different test cases, execute these test cases and discuss the test results

**The Commission Problem**

A rifle salesperson in the former Arizona Territory sold rifle locks, stocks, and barrels made by a gunsmith in Missouri. Locks cost $45, stocks cost $30, and barrels cost $25. The salesperson had to sell at least one lock, one stock, and one barrel (but not necessarily one complete rifle) per month, and production limits were such that the most the salesperson could sell in a month was 70 locks, 80 stocks, and 90 barrels. After each town visit, the salesperson sent a telegram to the Missouri gunsmith with the number of locks, stocks, and barrels sold in that town. At the end of a month, the salesperson sent a very short telegram showing –1 lock sold. The gunsmith then knew the sales for the month were complete and computed the salesperson’s commission as follows: 10% on sales up to (and including) $1000, 15% on the next $800, and 20% on any sales in excess of $1800.

**Test Cases for the Commission Problem**

Instead of going through 125 test cases again, we will look at some more interesting test cases for the commission problem. This time, we will look at boundary values derived from the output range, especially near the threshold points of $1000 and $1800 where the commission percentage changes.

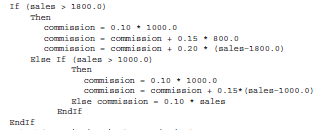
Test data : price Rs for lock - 45.0 , stock - 30.0 and barrel - 25.0

sales = total lock \* lock price + total stock \* stock price + total barrel \* barrel price

commission : 10% up to sales Rs 1000 , 15 % of the next Rs 800 and 20 % on any sales in excess of 1800

Pre-condition : lock = -1 to exit and 1< =lock < = 70 , 1<=stock <=80 and 1<=barrel<=90

Code snippet:



Code:

**#include <stdio.h>**

**int main()**

**{**

**float stocks, locks, barrels, sales=0.0, comission=0.0;**

**float barrelp= 25.0;**

**float stockp = 30.0;**

**float lockp = 45.0;**

**printf("\n Enter the number of locks: ");**

**scanf("%f", &locks);**

**printf("\n Enter the number of stocks: ");**

**scanf("%f", &stocks);**

**printf("\n Enter the number of barrels: ");**

**scanf("%f", &barrels);**

**sales = locks \* lockp + stocks \* stockp + barrels \* barrelp;**

**printf("\nSales = %d", (int)sales);**

**if(sales> 1800.0)**

**{**

**comission = 0.10\*1000;**

**comission = comission + 0.15\*800.0;**

**comission = comission + 0.20\*(sales-1800.0);**

**}**

**else if(sales >1000.0)**

**{**

**comission = 0.10 \* 1000.0;**

**comission = comission + 0.15\*(sales-1000.0);**

**}**

**else**

**comission = 0.10 \* sales;**

**printf("\nComission = %f", comission);**

**return 0;**

**}**

**Checking boundary value for locks, stocks and barrels and commission**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Input data** | | | **Expected output** | | **Actual output** | |  |  | |
| **Case id** | **Description** | **Total Locks** | **Total stocks** | **Total barrels** | **Sales** | **Commission** | **Sales** | **Commission** | **Status** | **Comment** | |
| **1** | Enter the min value for locks, stocks and barrels | 1 | 1 | 1 | 100 | 10 | 100 | 10.00 | Pass | Output minimum |
| **2** | Enter the min value for 2 items and min +1 for  any one item | 1 | 1 | 2 | 125 | 12.5 | 125 | 12.50 | Pass | Output minimum + |
| **3** | 1 | 2 | 1 | 130 | 13 | 130 | 13.00 | Pass | Output minimum + |
| **4** | 2 | 1 | 1 | 145 | 14.5 | 145 | 14.50 | Pass | Output minimum + |
| **5** | Enter the value sales approximately mid value  between 100 to 1000 | 5 | 5 | 5 | 500 | 50 | 500 | 50.00 | Pass | Midpoint |
| **6** | Enter the values to calculate the commission for  sales nearly less than 1000 | 10 | 10 | 9 | 975 | 97.5 | 975 | 97.50 | Pass | Border point - |
| **7** | 10 | 9 | 10 | 970 | 97.5 | 970 | 97.00 | Fail | Border point - |
| **8** | 9 | 10 | 10 | 955 | 95.5 | 955 | 95.50 | Pass | Border point - |
| **9** | Enter the values sales exactly equal to 1000 | 10 | 10 | 10 | 1000 | 100 | 1000 | 100.00 | Pass | Border point |
| **10** | Enter the values to calculate the commission for  sales nearly greater than 1000 | 10 | 10 | 11 | 1025 | 103.75 | 1025 | 103.75 | Pass | Border point + |
| **11** | 10 | 11 | 10 | 1030 | 104.5 | 1030 | 104.50 | Pass | Border point + |
| **12** | 11 | 10 | 10 | 1045 | 106.75 | 1042 | 106.75 | Pass | Border point + |
| **13** | Enter the value sales approximately mid value between 1000 to 1800 | 14 | 14 | 14 | 1400 | 160 | 1400 | 160.00 | Pass | Midpoint |
| **14** | Enter the values to calculate the commission for  sales nearly less than 1800 | 18 | 18 | 17 | 1775 | 216.25 | 1775 | 216.25 | Pass | Border point - |
| **15** | 18 | 17 | 18 | 1770 | 215.5 | 1770 | 215.50 | Pass | Border point - |
| **16** | 17 | 18 | 18 | 1755 | 213.25 | 1755 | 213.25 | Pass | Border point - |
| **17** | Enter the values sales exactly equal to 1800 | 18 | 18 | 18 | 1800 | 220 | 1800 | 220.00 | Pass | Border point |
| **18** | Enter the values to calculate the commission for  sales nearly greater than 1800 | 18 | 18 | 19 | 1825 | 225 | 1825 | 225.00 | Pass | Border point + |
| **19** | 18 | 19 | 18 | 1845 | 229 | 1830 | 226.00 | Fail | Border point + |
| **20** | 19 | 18 | 18 | 1845 | 229 | 1845 | 229.00 | Pass | Border point + |
| **21** | Enter the values normal value for lock, stock and  barrel | 48 | 48 | 48 | 4800 | 820 | 4800 | 820.00 | Pass | Midpoint |
| **22** | Enter the max value for 2 items and max - 1 for  any one item | 70 | 80 | 89 | 7775 | 1415 | 7775 | 1415.00 | Pass | Output maximum - |
| **23** | 70 | 79 | 90 | 7770 | 1414 | 7770 | 1414.00 | Pass | Output maximum - |
| **24** | 69 | 80 | 90 | 7755 | 1411 | 7755 | 1411.00 | Pass | Output maximum - |
| **25** | Enter the max value for locks, stocks and barrels | 70 | 80 | 90 | 7800 | 1420 | 7800 | 1420.00 | Pass | Output maximum |

**Output Special Value Test Cases**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Input data** | | | **Expected output** | | **Actual output** | |  |  | |
| **Case id** | **Description** | **Total Locks** | **Total stocks** | **Total barrels** | **Sales** | **Commission** | **Sales** | **Commission** | **Status** | **Comment** | |
| **1** | Enter the random values such that to calculate  commission for sales nearly less than 1000 | 11 | 10 | 8 | 995 | 99.5 | 995 | 99.50 | Pass | Border point - |
| **2** | Enter the random values such that to calculate  commission for sales nearly greater than 1000 | 10 | 11 | 9 | 1005 | 100.75 | 1005 | 100.75 | Pass | Border point + |
| **3** | Enter the random values such that to calculate  commission for sales nearly less than 1800 | 18 | 17 | 19 | 1795 | 219.25 | 1795 | 219.25 | Pass | Border point - |
| **4** | Enter the random values such that to calculate  commission for sales nearly greater than 1800 | 18 | 19 | 17 | 1805 | 221 | 1805 | 221.00 | Pass | Border point + |