# First Steps in Programming: Data Types, Calculations - Exercise

Tasks for exercise in class and for homework to the course  ["Programming Fundamentals and Unit Testing" @ SoftUni](https://softuni.bg/trainings/4256/programming-fundamentals-and-unit-testing-september-2023).

Test your tasks in the Judge system: <https://judge.softuni.org/Contests/4344>

## Console Converter: USD to BGN

Write a program **to convert US dollars** (USD) **to Bulgarian leva** (BGN). Use a fixed **rate** between dollar and lev:  **1 USD =** 1.79549 **BGN.**

### Example Input/Output

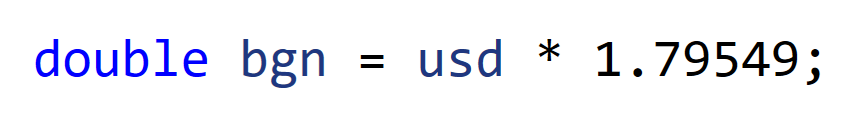
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 22 | 39.50078 | 100 | 179.549 | 12.5 | 22.443625 |

### Guidelines

1. Read the input data from the console (**US dollars**):



1. Create **a new variable** in which you will convert from US dollars to Bulgarian leva, knowing the **exchange rate**:



1. Print the received Bulgarian leva.



## Console converter: from radians to degrees

Write a program that reads **an angle**  [**in radians**](https://bg.wikipedia.org/wiki/%D0%A0%D0%B0%D0%B4%D0%B8%D0%B0%D0%BD) (decimal number) and converts it to [**degrees**](https://bg.wikipedia.org/wiki/%D0%93%D1%80%D0%B0%D0%B4%D1%83%D1%81_(%D1%8A%D0%B3%D1%8A%D0%BB)). Use the formula: **degree = radian \* 180 / π.** The number **π** in C# programs is available through **Math**.PI.

### Example Input/Output

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 3.1416 | 180.0004209182994 | 6.2832 | 360.0008418365988 | 0.7854 | 45.00010522957485 |

### Guidelines

1. Read the input data from the console (**radians**):
2. Create **a new variable** in which you will convert radians to degrees, knowing **the calculation formula**:



1. Print the resulting degrees:

## Deposit Calculator

Write a program that calculates how **much you** will receive at the end of **the deposit period** at a certain **interest rate**. Use the following formula:

**amount = deposited amount + term of deposit \* (deposited amount \* annual interest rate) / 12**

### Input

From the console read **3 lines**:

1. **Deposited amount – real number in the range [100.00 ... 10000.00]**
2. **Term of the deposit (in months) – an integer in the range [1... 12]**
3. **Annual interest rate – real number in the range [0.00 ... 100.00]**

### Output

Print the amount on the console at the end of the term.

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **200**  **3**  **5.7** | 202.85 | 1. We calculate the accumulated interest: **200** \* 0.057 (**5.7**%) = **11.40** BGN.  2. We calculate the interest for 1 month: **11.40** BGN / **12** months = **0.95** BGN.  3. The total amount is:  **200 BGN +** 3 **\*** 0.95 **BGN = 202.85 BGN** |
| **Input** | **Output** | **Comments** |
| **2350**  6  **7** | 2432.25 | 1. We calculate the accumulated interest: **2350** \* 0.07 (**7**%) = **164.50** BGN.  2. We calculate the interest for 1 month: **164.50** BGN / **12** months = **13.7083...** Lv.  3. The total amount is: **2350** BGN + **6** \* **13.7083...** = 202.85 BGN |

## Mandatory Literature

For the summer holidays, there are a certain number of books on Joro's list of mandatory literature. Since Joro prefers to play with friends outside, your task is to help him calculate how many **hours a day** he should devote to read the necessary literature.

### Input

Read **3 lines** from the console:

1. **Number of pages**  in the current book **– an integer in the range [1... 1000]**
2. **Pages** that he reads **in 1 hour** **– an integer in the range [1... 1000]**
3. **The number of days** he needs to finish the book – **an integer in the range [1... 1000]**

**Hint: *For the operands of integer types, the result of the / operator is of an integer type and equals the quotient of the two operands rounded towards zero.***

### Output

Print on the console the **number of hours** that Joro has to spend reading each day.

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **212**  **20**  **2** | 5 | Total reading time of the book: **212** pages / **20** pages per hour = **10** hours total  Required hours per day: 10 **hours /** 2 **days = 5 hours per day** |
| **Input** | **Output** | **Comments** |
| **432**  **15**  **4** | 7 | Total reading time of the book: **432** pages / **15** pages per hour = **28** hours total  Required hours per day: 28 **hours /** 4 **days = 7 hours per day** |

## Teaching materials

The school year has already started and the 10B grade manager - Annie has to buy a certain number of **packets of pens**, **packets with markers,** as well as **board cleaner.** She is a regular client of a bookstore, so there is **a discount** for her, which represents **some discount percentage of the total amount**.  **Write a program that calculates how much money Annie will need to collect to pay the bill, keeping in mind the following price list:**

* **Package of pens - 5.80 lv.**
* **Package of markers - 7.20 lv.**
* **Board cleaner - 1.20 BGN (per liter)**

### Input

From the console read **4 numbers**:

* **Number of packages of pens** - **integer in the range [0...100]**
* **Number of packets of markers** - **integer in the range [0...100]**
* **Liters of board cleaner** - **an integer in the range [0... 50]**
* **Discount percentage** - **integer in the range [0...100]**

### Output

Print on the console **how much money will Annie need** to pay the bill.

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **2**  **3**  **4**  **25** | 28.5 | **Price of packages of pens** => **2** \* **5.80** = 11.60 BGN  **Price of marker packages** => **3** \* 7.20 **= 21.60 BGN**  **Price of the board cleaner** => 4 **\*** 1.20 **= 4.80 BGN**  **Price for all materials** => 11.60 + 21.60 + 4.80 = **38.00 BGN**  **Calculating the discount 25% = 0.25**  **Price after discount** = 38.00 – (**38.00** \* **0.25**) = 28.50 BGN |
| **Input** | **Output** | **Comments** |
| **4**  **2**  **5**  **13** | 37.932 | **Price of packages of pens** => **4** \* **5.80** = 23.20 BGN  **Price of marker packages =**> **2** \* **7.20** = 14.40 BGN  **Price of the board cleaner** => **5** \* **1.20** = 6.00 BGN  **Price for all materials =**> 23.20 + 14.40 + 6.00 = 43.60 **BGN**  **Calculating the discount 13% = 0.13**  **Price after discount** = 43.60 – (**43.60** \* **0.13**) = 37.932 BGN |

## Redecorating

Rumen wants to repaint the living room and has hired craftsmen for this purpose. Write **a program** that **calculates the cost of the repair,** taking the following **prices** for the calculation:

* **Protective nylon - 1.50 BGN per square meter**
* **Paint - 14.50 BGN per liter**
* **Paint thinner - 5.00 BGN per liter**

Just in case, to the **necessary** materials, Rumen wants **to** add **another 10%** of the amount of paint **and 2 square meters of nylon, also 0.40** **leva for bags. The amount** paid to the craftsmenfor **1 hour of work** is equal to **30% of the sum of all material costs.**

### Input

The input is read from **the console** and contains **exactly 4 lines**:

1. **Required amount of nylon (in sq.m.)** - an integer number in the range [1... 100]
2. **Required amount of paint (in liters)** - an integer number in the range [1... 100]
3. **Quantity of thinner (in liters) -** integer number in the range [1... 30]
4. **Hours** **needed for the craftsmen to do the work** - an integer number in the range [1... 9]

### Output

**Print out only one line on the console**:

* "{the sum of all costs}"

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Entrance** | **Exit** | **Comments** |
| **10**  **11**  **4**  **8** | 727.09 | Nylon amount: (10  **+** 2**) \*** 1.50 **= 18 BGN**  Amount for paint: (**11** + 10%**) \*** 14.50 **=** **175.45 BGN**  Amount for thinner: **4** \* 5.00 = **20.00 BGN**  Amount for bags: **0.40 BGN**  Total amount for materials: 18 + 175.45 + 20.00 + 0.40 **= 213.85 BGN**  Amount for craftsmen: (213.85 \* 30%) \* 8 = **513.24 BGN**  Total amount: 213.85 + 513.24 = **727.09 BGN** |
| **5**  **10**  **10**  1 | 286.52 | Amount for nylon: (**5** + **2**) \* 1.50 **= 10.50 BGN**  Amount for paint: (**10 +**  10%) \* **14.50 = 159.50 BGN**  Amount for thinner: **10** \* **5.00** = **50.00 BGN**  Amount for bags: **0.40 BGN**  Total amount for materials: 10.50 + 159.50 + 50.00 +  **0.40 = 220.40 BGN**  Amount for masters: (220.40 \* 30%) \* **1** = **66.12 BGN**  Total: 220.40 + 66.12 = **286.52 BGN** |

## Food Delivery

The restaurant opens its doors and offers several menus at preferential prices:

* **Chicken menu – 10.35 lv.**
* **Menu with fish – 12.40 lv.**
* **Vegetarian menu – 8.15** lv.

**Write a program that calculates how much it will cost a group of people to order takeaways.**

The group will also order a dessert, the **price** of which is equal to **20% of the total bill** (excluding delivery).

The delivery price is **2.50** BGN and is **finally charged.**

### Input

From the console read **3 lines**:

* **Number of chicken menus – integer in the range [0 ... 99]**
* **Number of menus with fish – integer in the range [0 ... 99]**
* **Number of vegetarian menus – an integer in the range [0 ... 99]**

### Output

**Print out only one line on the console: "{order price}"**

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **2**  **4**  **3** | 116.2 | **Price for chicken menus: 2 pieces \* 10.35 = 20.70**  **Price for the menus with fish: 4 pieces \* 12.40 = 49.60**  **Price for vegetarian menus: 3 pieces \* 8.15 = 24.45**  **Total cost of menus: 20.70 + 49.60 + 24.45 = 94.75**  **Price of dessert: 20% from 94.75 = 18.95**  **Delivery price: 2.50 (conditional)**  **Total order price: 94.75 + 18.95 + 2.50 = 116.20** |
| **Input** | **Output** | **Comments** |
| **9**  **2**  **6** | 202.72 | **Price for chicken menus: 9 pieces \* 10.35 = 93.15**  **Price for fish menus: 2 pieces \* 12.40 = 24.80**  **Price for vegetarian menus: 6 pieces \* 8.15 = 48.90**  **Total cost of menus: 93.15 + 24.80 + 48.90 = 166.85**  **Price of dessert: 20% from 166.85 = 33.37**  **Delivery price: 2.50 (conditional)**  **Total order price: 166.85 + 33.37 + 2.50 = 202.72** |

## Basketball equipment

Jesse decides he wants to play basketball, but he needs equipment to train. **Write a program that calculates the expenses of Jesse if he starts training, knowing how much is the fee for basketball training for a period of 1 year.**

* **Basketball sneakers – their price is 40% less than the fee for one year**
* **Basketball team – its price is 20% cheaper than that of sneakers**
* **Basketball – its price is 1 / 4 of the price of the basketball team**
* Basketball accessories – their price is 1 / 5 of the price of the basketball

### Input

From the console read **1 row**:

* **The annual basketball training fee – an integer in the range [0... 9999]**

### Output

Print on the console **how much Jesse will spend if he starts playing basketball.**

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **365** | 811.76 | **Price of training per year: 365**  **Price of basketball sneakers: 365 – 40% = 219**  **Price per basketball team: 219 – 20% = 175.20**  **Price of basketball: 1 / 4 from 175.20 = 43.80**  **Price of basketball accessories: 1 / 5 from 43.80 = 8.76**  **Total price for the equipment: 365 + 219 + 175.20 + 43.80 + 8.76 = 811.76** |
| **Input** | **Output** | **Comments** |
| **550** | 1223.2 | **Price of training per year: 550**  **Price of basketball sneakers: 550 – 40% = 330**  **Price per basketball team: 330 – 20% = 264**  **Basketball price: 1/4 of 264 = 66**  **Price of basketball accessories: 1 / 5 from 66 = 13.20**  **Total price for the equipment: 550 + 330 + 264 + 66 + 13.20 = 1223.2** |

## Aquarium

For his birthday, Lyubomir received an aquarium in the shape of a parallelepiped. **Initially, we read from the console in separate rows its dimensions – length, width and height in centimeters.** It is necessary to calculate how many liters of water the aquarium will collect, if it is known that a certain percentage of its capacity is occupied by sand, plants, heater and pump.

One liter of water is equal to one cubic decimeter (**1 l = 1 dm3**).

**Write a program that calculates the liters of water that are needed to fill the aquarium.**

### Input

From the console read **4 lines**:

1. **Length in cm – an integer number in the range [10 ... 500]**
2. **Width in cm – an integer number in the range [10 ... 300]**
3. **Height in cm – an integer number in the range [10... 200]**
4. **Percentage – floating point number in the range [0.000 ... 100.000]**

### Output

Print one number on the console:

* **the liters of water that the aquarium will collect, rounded to the second decimal place**.

### Example Input/Output

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Comments** |
| **85**  **75**  **47**  **17** | 248.69 | Volume of the aquarium: **85** \* **75** \* **47** = **299625** cm3  Volume in liters:  **299625** \* 0.001 or **299625** / 1000 => **299.625** liters  Occupied space: 17%  **=** 0.17  Required liters: 299.625 **\* (1 -** 0.17**)** = 248.68875 liters |
| **Input** | **Output** | **Comments** |
| **105**  **77**  **89**  **18.5** | 586.45 | Volume of the aquarium: **105** \* **77** \* **89** = **719565** cm3  Volume in  **liters: 719565** \* 0.001 or **719565** / 1000 => **719.565** liters  Occupied space: **18.5%** = **0.185**  Required liters: 719.565 **\* (1 - 0.185**) **= 586.445475 liters** |