Exercise: First Steps in Coding

Problems for exercise and homework for the "**Programming Basics**" course [@ SoftUni Global](#).

Submit your solutions in the Judge system at: https://judge.softuni.org/Contests/2388/First-Steps-In-Coding-Exercise

1. Converter: USD to BGN

Write a program for converting US dollars (USD) into Bulgarian levs (BGN). Use a fixed exchange rate between the dollar and the lev: **1 USD** = **1.79549 BGN**.

Sample Input and Output

Input	Output
22	39.50078

Input	Output
100	179.549

Input	Output
12.5	22.443625

Hints and Guidelines

1. Read console input (US dollars):

```
Scanner scan = new Scanner(System.in);
double usd = Double.parseDouble(scan.nextLine());
```

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

```
double bgn = usd * 1.79549;
```

3. Print the received Bulgarian levs.

```
System.out.println(bgn);
```

2. Radians to Degrees

Write a program that reads an angle in [radians](#) (decimal number) and converts it to [degrees](#). Use the formula: **degree = radian * 180 / π**. The number **π** in Java programs is available through **Math.PI**.

Sample Input and Output

Input	Output
3.1416	180.0004209182994

Input	Output
6.2832	360.0008418365988

Input	Output
0.7854	45.00010522957485

Hints and Guidelines

1. Read the input from the console (**radians**):

```
Scanner scanner = new Scanner(System.in);
double radians = Double.parseDouble(scanner.nextLine());
```

2. Create a new variable in which you will convert from radians to degrees, knowing the calculation formula:

```
double degrees = radians * 180 / Math.PI;
```

3. Print the degrees:

```
System.out.println(degrees);
```

3. 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 the deposit * ((deposited amount * annual interest rate) / 12)

Input Data

3 lines are read from the console:

1. **Deposit amount – a floating-point number in the interval [100.00 … 10000.00]**
2. **Term of the deposit (in months) – an integer in the interval [1…12]**
3. **Annual interest rate – a floating-point number in the interval [0.00 …100.00]**

Output Data

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

Sample Input and Output

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

4. Vacation Books List

There are several books on John's list of required literature for the summer vacation. Because John prefers to play with friends outside, your task is to help him calculate how many hours a day he has to spend reading the necessary literature.

Input Data

3 lines are read from the console:

1. **Number of pages** in the current book **– an integer in the interval [1…1000]**
2. **Pages** read in 1 hour - **an integer in the interval [1…1000]**

3. **The number of days** for which you must read the book - **an integer in the range [1…1000]**

Output Data

To print on the console the number of hours that John has to spend reading each day.

Sample Input and Output

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

Sample Exam Problems

5. Supplies for School

The school year has already started and the head of the 10B class - Sophie has to buy a certain number **of packets of pens, packets of markers,** and **detergent for cleaning the board**. She is a regular customer of a bookstore, so there is a **discount** for her, which is a percentage of the total. Write a program that calculates **how much money** Sophie **will have to raise to pay the bill**, keeping in mind the following price list:

- **Package of pens- 5.80 BGN.**
- **Package of markers - 7.20 BGN.**
- **Detergent- 1.20 BGN (for liter)**

Input Data

4 numbers are read from the console:

- **Package of pens - an integer in the range [0...100]**
- **Package of markers – an integer in the range [0...100]**
- **Liters of detergent – an integer in the range [0…50]**
- **Percentage reduction – an integer in the range [0...100]**

Output Data

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

Sample Input and Output

Input	Output	Comments

2 3 4 25	28.5	**Price of packages of pens** => 2 * 5.80 = 11.60 BGN. **Price of packages of markers** => 3 * 7.20 = 21.60 BGN. **Price of detergents** => 4 * 1.20 = 4.80 BGN. **Price for all products** => 11.60 + 21.60 + 4.80 = 38.00 BGN. 25% = 0.25 **Price with discount** = 38.00 – (38.00 * 0.25) = 28.50 BGN.
Input	**Output**	
4 2 5 13	37.932	**Price of packages of pens** => 4 * 5.80 = 23.20 BGN. **Price of packages of markers** => 2 * 7.20 = 14.40 BGN. **Price of detergents** => 5 * 1.20 = 6.00 BGN. **Price for all products** => 23.20 + 14.40 + 6.00 = 43.60 BGN. 13% = 0.13 **Price with discount** = 43.60 – (43.60 * 0.13) = 37.932 BGN.

6. Repainting

Peter wants to repaint the living room and has hired craftsmen for this purpose. Write a **program** that **calculates the cost of repairs**, given the following **prices**:

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

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

Input Data

The input is readable from the console and contains 4 lines:

1. **Required amount of nylon (in square meters) – an integer in the range [1... 100]**
2. **Required amount of paint (in liters) – an integer in the range [1…100]**
3. **Quantity of detergent (in liters) – an integer in the range [1…30]**
4. **Hours** for which the workers will do the work **- an integer in the interval [1…9]**

Output Data

On the console print:

- `"{total sum of all costs}"`

Sample Input and Output

Input	Output	Comments
10 11 4 8	727.09	Sum for nylon: (10 + 2) * 1.50 = 18 BGN Sum for paint: (11 + 10%) * 14.50 = 175.45 BGN Sum for detergent: 4 * 5.00 = 20.00 BGN Sum for bags: 0.40 BGN Total sum for materials: 18 + 175.45 + 20.00 + 0.40 = 213.85 BGN Sum for workers: (213.85 * 30%) * 8 = 513.24 BGN Total sum: 213.85 + 513.24 = 727.09 BGN
5 10 10 1	286.52	Sum for nylon: (5 + 2) * 1.50 = 10.50 BGN Sum for paint: (10 + 10%) * 14.50 = 159.50 BGN Sum for detergent: 10 * 5.00 = 50.00 BGN Sum for bags: 0.40 BGN: 10.50 + 159.50 + 50.00 + 0.40 = 220.40 BGN Total sum for workers: (220.40 * 30%) * 1 = 66.12 BGN

		Total sum: 220.40 + 66.12 = 286.52 BGN

7. Food Delivery

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

- **Chicken menu – 10.35 BGN.**
- **Fish menu – 12.40 BGN.**
- **Vegetarian menu – 8.15** BGN.

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 Data

3 lines are read from the console:

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

Output Data

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

Sample Input and Output

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

8. Basketball Equipment

Jesse decides he wants to play basketball, but he needs equipment to train. Write a program that **calculates** what **costs Jesse will have if he starts training**, knowing how much the **basketball training fee** is for **1 year**. Required equipment:

- **Basketball sneakers – their price is 40% less than the fee for one year**
- **Basketball outfit – its price is 20% cheaper than the sneakers**
- **Ball – its price is 1 / 4 of the price of the outfit**
- **Basketball Accessories –its price is 1 / 5 of the price of the ball**

Input Data

1 line is read from the console:

- **The annual fee for basketball training - an integer in the interval [0… 9999]**

Output Data

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

Sample Input and Data

Input	Output	Comments
365	811.76	**Price of training for the year: 365** **Price of basketball sneakers: 365 – 40% = 219** **Price of a basketball sneakers: 219 – 20% = 175.20** **Price of a ball: 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**	
550	1223.2	**Price of training for the year: 550** **Price of basketball sneakers: 550 – 40% = 330** **Price of a basketball sneakers: 330 – 20% = 264** **Price of a ball: 1 / 4 from 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**

9. Fish Tank

For his birthday, Steven 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 / 1l = 1 dm^3 /.

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

Input Data

4 lines are read from the console:

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

Output Data

Print a number on the console:

- **liters of water, that the aquarium contains**.

Sample Input and Data

Input	Output	Comments
85 75 47 17	248.68875	Volume of aquarium: **85** * **75** * **47** = **299625** cm^3 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**	
105 77 89 18.5	586.445475	Volume of aquarium: **105** * **77** * **89** = **719565** cm^3 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