Lab: Data Types and Variables

Problems for exercises and homework for the "Technology Fundamentals" course @ SoftUni.

You can check your solutions in Judge.

I. **Integer and Real Numbers**

1. Convert Meters to Kilometers

You will be given an integer that will be distance in meters. Write a program that converts meters to kilometers formatted to the second decimal point.

Examples

Input	Output
1852	1.85
798	0.80

2. Pounds to Dollars

Write a program that converts British pounds to US dollars formatted to 3th decimal point.

1 British Pound = 1.31 Dollars

Examples

Input	Output
80	104.800
39	51.090

3. Exact Sum of Real Numbers

Write program to enter n numbers and calculate and print their exact sum (without rounding).

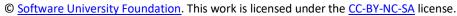
Examples

Input	Output
3 1000000000000000000000000000000000000	1000000000000000015
2 0.00000000003 333333333333333333333333	333333333333333333333333333333333333333

Hints

Use **BigDecimal** to not lose precision.





















Data Types and Type Conversion II.

4. Town Info

You will be given 3 lines of input. On the first line you will be given the name of the town, on the second – the population and on the third the area. Use the correct data types and print the result in the following format:

"Town {town name} has population of {population} and area {area} square km".

Examples

Input	Output
Sofia	Town Sofia has population of 1286383 and area 492 square km.
1286383	
492	

5. Concat Names

Read two names and a delimiter. Print the names joined by the delimiter.

Examples

Input	Output
John Smith ->	John->Smith
Jan White <->	Jan<->White
Linda Terry =>	Linda=>Terry

6. Chars to String

Write a program that reads 3 lines of input. On each line you get a single character. Combine all the characters into one string and print it on the console.

Examples

Input	Output
а	abc
b	
С	
%	%2o
2	
0	
1	15p
5	















р

7. Reversed Chars

Write a program that takes 3 lines of characters and prints them in reversed order with a space between them.

Examples

Input	Output
Α	СВА
В	
С	
1	& L 1
L &	
&	

8. Lower or Upper

Write a program that prints whether a given character is upper-case or lower case.

Examples

Input	Output
L	upper-case
f	lower-case

9. Centuries to Minutes

Write program to enter an integer number of centuries and convert it to years, days, hours and minutes.

Examples

Input	Output
1	1 centuries = 100 years = 36524 days = 876576 hours = 52594560 minutes
5	5 centuries = 500 years = 182621 days = 4382904 hours = 262974240 minutes

Hints

- Use appropriate data type to fit the result after each data conversion.
- Assume that a year has 365.2422 days at average (the Tropical year).

Solution

You might help yourself with the code below:



















```
Scanner scanner = new Scanner (System.in);
int centuries = Integer.parseInt(scanner.nextLine());
int years = centuries * 100;
int days = (int) (years * 365.2422);
int hours = days * 24;
int minutes = hours * 60;
System.out.printf("%d centuries = %d years = %d days = %d hours = %d minutes",
        years,
        days,
        hours,
        minutes
);
```

Special Numbers 10.

A number is special when its sum of digits is 5, 7 or 11.

Write a program to read an integer n and for all numbers in the range 1...n to print the number and if it is special or not (True / False).

Examples

Input	Output
15	1 -> False
	2 -> False
	3 -> False
	4 -> False
	5 -> True
	6 -> False
	7 -> True
	8 -> False
	9 -> False
	10 -> False
	11 -> False
	12 -> False
	13 -> False
	14 -> True
	15 -> False

Hints

To calculate the sum of digits of given number num, you might repeat the following: sum the last digit (num % 10) and remove it (sum = sum / 10) until num reaches 0.

Variables III.

Refactor Volume of Pyramid 11.

You are given a working code that finds the volume of a pyramid. However, you should consider that the variables exceed their optimum span and have improper naming. Also, search for variables that have multiple purpose.

















Code

```
Sample Code
Scanner scanner = new Scanner(System.in);
double dul, sh, V = 0;
System.out.print("Length: ");
dul = Double.parseDouble(scanner.nextLine());
System.out.print("Width: ");
sh = Double.parseDouble(scanner.nextLine());
System.out.print("Heigth: ");
V = Double.parseDouble(scanner.nextLine());
V = (dul + sh + V) / 3;
System.out.printf("Pyramid Volume: %.2f", V);
```

Hints

- Reduce the span of the variables by declaring them in the moment they receive a value, not before
- Rename your variables to represent their real purpose (example: "dul" should become length, etc.)
- Search for variables that have multiple purpose. If you find any, introduce a new variable.

12. Refactor Special Numbers

You are given a working code that is a solution to Problem 9. Special Numbers. However, the variables are improperly named, declared before they are needed and some of them are used for multiple things. Without using your previous solution, modify the code so that it is easy to read and understand.

Code

```
Sample Code
Scanner scanner = new Scanner (System.in);
int kolkko = Integer.parseInt(scanner.nextLine());
int obshto = 0;
int takova = 0;
boolean toe = false;
for (int ch = 1; ch <= kolkko; ch++) {</pre>
    takova = ch;
    while (ch > 0) {
         obshto += ch % 10;
        ch = ch / 10;
    toe = (obshto == 5) \mid \mid (obshto == 7) \mid \mid (obshto == 11);
    System.out.printf("%d -> %b%n", takova, toe);
    obshto = 0;
    ch = takova;
```

















Hints

- Reduce the span of the variables by declaring them in the moment they receive a value, not before
- Rename your variables to represent their real purpose (example: "toe" should become is Special Num, etc.)
- Search for variables that have multiple purpose. If you find any, introduce a new variable















