Exercise: For Loop

Problems for exercise and homework for the "**Programming Basics**" course @ SoftUni Global.

Submit your solutions in the **SoftUni Judge** system at: https://judge.softuni.org/Contests/3694

1. Numbers Ending in 7

Write a program that prints numbers **in the range 1 to 1000** that end in **7**.

Input	Output
(no input)	7 17 27 … 997

Hints and Guidelines

1. Make a **for loop** to **print a number** if it **ends in 7**. The initial step from which you can **start is 7 and the final one is 997**. The first number in your series is **7** and the last is **997**.

```java
for (int i = 7; i <= 997; i++) {

}
```

2. To print numbers **ending in 7**, you must check that the **current number ends in 7**. To do this, use a **modular division of 10** and print the number if **the result of this division is 7**.
   * Note: With a modular division of 10 you can find the last digit of any integer, regardless of its length.

```java
for (int i = 7; i <= 997; i++) {
    if (i % 10 == 7) {
        System.out.println(i);
    }
}
```

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#0

2. Half Sum Element

Write a program that reads **n-number integers** entered by the user and checks if there is a number among them which is equal to the sum of all the others.

- If there is such an element, print "**Yes**" and on a new line "**Sum = **" + **its value**
- If there is no such element, print "**No**" and on a new line "**Diff = **" + **the difference between the largest number and the sum of the other** (in absolute value)

Sample Input and Output

Input	Output	Comments
7 3 4 1 1 2 **12** 1	Yes Sum = 12	3 + 4 + 1 + 2 + 1 + 1 = 12
4 **6** 1 2 3	Yes Sum = 6	1 + 2 + 3 = 6
3 1 1 **10**	No Diff = 8	$\lvert 10 - (1 + 1) \rvert$ = 8
3 5 5 1	No Diff = 1	$\lvert 5 - (5 + 1) \rvert$ = 1
3 1 1 1	No Diff = 1	

Hints and Guidelines

1. Read the input **n** (the number of the input numbers):

```
Scanner scan = new Scanner(System.in);
int n = Integer.parseInt(scan.nextLine());
```

2. Create two **new variables**. In one **calculate the maximum number**, in the other the **sum of all numbers**. Set **initial values** for both variables. Set the maximum variable to **Integer.MIN_VALUE**, and the sum variable to **0**.

```
int max = Integer.MIN_VALUE;
int sum = 0;
```

3. Make a **for loop to read n numbers**. Each time you read a number, **add it to the amount**. Check if **the number entered is greater than the current maximum**. If it is **greater**, the **maximum** becomes **equal to this number**.

Follow us:

```java
for (int i = 1; i <= n; i++) {
    int number = Integer.parseInt(scan.nextLine());
    sum += number;

    if (number > max) {
        max = number;
    }
}
```

4. Once you have the **sum of all the numbers** and the **maximum number among them**, find the sum of the numbers **without the maximum number**. Create a new variable in which to calculate **the amount without the maximum number**.

```java
int sumWithOutMaxNumber = sum - max;
```

5. 5. Check if the sum without the maximum number is equal to the **maximum number**, print two lines of output - (**Yes…) and the maximum numbe**r, or - (**No…) and the absolute value of the difference** between the maximum number and the sum of all numbers without the maximum (use **Math.abs** to find the **absolute value**).

```java
if (max == sumWithOutMaxNumber) {
    System.out.println("Yes");
    System.out.println("Sum = " + max);
} else {
    int diff = Math.abs(max - sumWithOutMaxNumber);
    System.out.println("No");
    System.out.println("Diff = " + diff);
}
```

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#1

3. Histogram

N integers are given in the interval [1… 1000]. Some of these, percentage **p1,** are below 200, another percentages **p2** are from 200 to 399, another percentages **p3** are from 400 to 599, other percentages **p4** are from 600 to 799 and the remaining **p5** percent are above 800. Write a program that calculates and prints the percentages **p1**, **p2**, **p3**, **p4**, and **p5**.

Example: we have n = **20** numbers: 53, 7, 56, 180, 450, 920, 12, 7, 150, 250, 680, 2, 600, 200, 800, 799, 199, 46, 128, 65. We get the following distribution and visualization:

Range	Numbers in the range	Numbers	Percentage
< 200	53, 7, 56, 180, 12, 7, 150, 2, 199, 46, 128, 65	12	p1 = 12 / 20 * 100 = **60.00%**
200 … 399	250, 200	2	p2 = 2 / 20 * 100 = **10.00%**
400 … 599	450	1	p3 = 1 / 20 * 100 = **5.00%**
600 … 799	680, 600, 799	3	p4 = 3 / 20 * 100 = **15.00%**

≥ 800	920, 800		2	p5 = 2 / 20 * 100 = **10.00%**

Input Data

The first line of the input is the integer n (1 ≤ **n** ≤ 1000) - count of numbers. The next **n lines** contain an **integer in the interval** [**1... 1000**] - the numbers with which to calculate the histogram.

Output Data

Print the **histogram** on the console - **5 lines**, each of which contain a number between 0% and 100%, formatted two digits after the decimal point, for example 25.00%, 66.67%, 57.14%.

Sample Input and Output

Input	Output
3 1 2 999	66.67% 0.00% 0.00% 0.00% 33.33%

Input	Output
4 53 7 56 999	75.00% 0.00% 0.00% 0.00% 25.00%

Input	Output
7 800 801 250 199 399 599 799	14.29% 28.57% 14.29% 14.29% 28.57%

Input	Output
9 367 99 200 799 999 333 555 111 9	33.33% 33.33% 11.11% 11.11% 11.11%

Input	Output
14 53 7 56 180 450 920 12 7 150 250 680 2 600 200	57.14% 14.29% 7.14% 14.29% 7.14%

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#2

4. Clever Lily

Lily is already N years old. She receives a gift for each of her **birthdays**.

- For the **odd** birthdays (**1, 3, 5...n**), she receives toys**.**
- For the **even** birthdays (**2, 4, 6...n**), she receives money.

For the **second birthday** she receives **10.00 USD**, as the amount increases by **10.00 USD**, for each subsequent even birthday (**2** -> **10**, **4** -> **20**, **6** -> **30** ... etc.). Over the years, Lily has secretly saved money. Lily's brother, in the years she receives money, **takes 1.00 USD from them**. Lily sold the toys received over the years, each for **p** USD, and **added the amount to the saved money**. With the money, she wanted to buy a washing machine for **x** USD. Write a program to calculate how much money **she has raised** and whether she **has enough to buy a washing machine**.

Input Data

3 lines are read from the console:

- **Lily's age – an integer in the range [1...77]**
- **Price of washing machine – a floating-point number in the range [1.00...10 000.00]**
- **Single price of a toy – an integer in the range [0...40]**

Follow us:

Output Data

On the console print:

- If Lily **has enough** money:
  - **"Yes! {N}"** - where **N** is the remaining money after the purchase
- If the money is **not enough**:
  - **"No! {M}"** - where **M** is the amount that is not enough

The numbers N and M must be formatted to the second decimal place.

Sample Input and Output

Input	Output	Comments
10 170.00 6	Yes! 5.00	On her first birthday, she receives a **toy** On her second birthday, she receives money (10 USD) She receives a **toy** on her third birthday On her fourth birthday, she receives **money** (20 USD) She gets a **toy** on her fifth birthday On her sixth birthday receives **money** (30 USD) She receives a **toy** on her seventh birthday On her eighth birthday, she receives **money** (40 USD) On her ninth birthday, she receives a **toy** On her tenth birthday, she receives **money** (50 USD) **She saved**: 10 + 20 + 30 + 40 + 50 = **150** USD She sold 5 toys and got * **6** USD = **30** USD Her brother took 5 times * **1** USD = **5** USD Total money saved: (**150** + **30**) – **5** = **175** USD **175 >= 170** (the price of the washing machine) => she managed to buy it **Remaining: 175** - **170** = **5** USD
21 1570.98 3	No! 997.98	She saved **550** USD. She sold **11** toys * **3** USD = **33** USD Her brother took **10** years * **1** USD = **10** USD Total money saved**: (550** + **33**) – **10** = **573** USD **573 < 1570.98** – failed to buy a washing machine Needed money**: 1570.98** – **573** = **997.98** USD

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#3
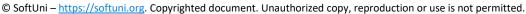
5. Salary

A company boss notices that more and more employees are spending time on sites that distract them.
To prevent this, he introduces surprise checks on the open tabs of his employees' browsers.
According to the open site, the following fines are imposed in the tab:

- **"Facebook" -> 150 USD**
- **"Instagram" -> 100 USD**

• **"Reddit" -> 50 USD**

Two lines are read from the console:
- **Number of open tabs in the browser n - integer in the range [1 ... 10]**
- **Salary - a number in the interval [500 ... 1500]**

Then **n-times** - the name of the website - text (string)

Output Data

- If during the inspection, the salary **becomes less than or equal to USD0**, it is printed on the console **"You have lost your salary."** and the program stops.
- Otherwise, after checking the console, the rest of the salary is displayed (to be written as an integer).

Sample Input and Output

Input	Output	Comments
10 750 Facebook Dev.bg Instagram Facebook Reddit Facebook Facebook	You have lost your salary.	There are **10** open tabs in the browser. The initial salary is: **750** For the first tab -> Facebook -> fine **150** USD (salary: **750** – **150** = **600**) For the second tab -> Dev.bg -> no fine For the third tab -> Instagram -> fine **100** USD (salary: **600** – **100** = **500**) For the fourth tab -> Facebook -> fine **150** USD (salary: **500** – **150** = **350**) For the fifth tab -> Reddit -> fine **50** USD (salary: **350** – **50** = **300**) For the sixth tab -> Facebook -> fine **150** USD (salary: **300** – **150** = **150**) For the seventh tab -> Facebook -> fine **150** USD (salary: **150** – **150** = **0**) The salary is equal to **0** => the corresponding output is printed and the program ends

Input	Output	Input	Output
3 500 Github.com Stackoverflow.com softuni.bg	500	3 500 Facebook Stackoverflow.com softuni.bg	350

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#4

6. Oscars

You are invited by the academy to write software to calculate the points for an actor / actress. The academy will give you initial **points for the actor**. Then each **evaluator** will give **his evaluation**. The points that the **actor receives** are formed with the length of the evaluator's name multiplied by the points he gives divided by two.

If the result at some point exceeds 1250.5 the program must be interrupted, and it must be printed that the actor has received a nomination.

Input Data

- Actor's name- **string**
- Points from the academy – **a floating-point number in the range [2.0... 450.5]**
- Number of evaluators **n** – **integer in the range [1... 20]**

On the next **n number of rows**:

Follow us:

- o   Name of evaluator - **string**
- o   Evaluator points – **a floating-point number in the range [1.0… 50.0]**

Output Data

On the console print:

- If the points are above **1250.5**:

  "Congratulations, {actor's name} got a nominee for leading role with {points}!"

- If the points are not enough:

  "Sorry, {actor's name} you need {needed points} more!"

The result should be formatted to the first digit after the decimal point!

Sample Input and Output

Input	Output	Comments
Mark Zuckerberg **205** **4** Johnny Depp **45** Will Smith **29** Jet Lee **10** Matthew Mcconaughey **39**	Sorry, Mark Zuckerberg you need 247.5 more!	Mark Zuckerberg starts with **205** points, and **4** people will rate him. First is Johnny Depp => **205** + ((11 * **45**) / 2) = **452.5** Second is Will Smith => **452.5** + ((10 * **29**) / 2) = **597.5** Third is Jet Lee => **597.5** + ((7 ***10**) / 2) = **632.5** Fourth is Matthew Mcconaughey => **632.5** + ((19 * **39**) / 2) = **1003.0** **1003.0** < **1250.5** => The points are not enough. Neded points: **1250.5** - **1003.0** = 247.5
Sandra Bullock 340 5 Robert De Niro 50 Julia Roberts 40.5 Daniel Day-Lewis 39.4 Nicolas Cage 29.9 Will Smith 33	Congratulations, Sandra Bullock got a nominee for leading role with 1268.5!	

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#5

7. Trekking Mania

Climbers from all over the world gather in groups and mark the next peaks to climb. Depending on the **size of the group**, the climbers will climb **different peaks**.

- Group of up to **5 people** – climb **Mount Funi**
- Group of **6 to 12 people** – climb **Mont Blanc**
- Group of **13 to 25 people** – climb **Kilimanjaro**
- Group of **26 to 40 people** – climb **K2**
- Group of **41 or more people** – climb **Everest**

Write a program that calculates the percentage of climbers climbing each peak**.**

Input Data

From the console read:

- **On the first row** – **number of groups of climbers** – **an integer in the range [1...1000]**
- **For each group print the number of the climbers** – **an integer in the range [1...1000]**

Output Data

5 rows are printed on the console, each containing a **percentage between 0.00% and 100.00%, formatted to the second digit after the decimal point**.

- **First row** – the percentage of people climbing **Mount Funi**
- **Second row** – the percentage of people climbing **Mont Blanc**
- **Third row** – the percentage of people climbing **Kilimanjaro**
- **Fourth row** – the percentage of people climbing **K2**
- **Fifth row** – the percentage of people climbing **Everest**

Sample Input and Output

Input	Output	Comments
10 10 5 1 100 12 26 17 37 40 78	1.84% 6.75% 5.21% 31.60% 54.60%	All climbers: 10 + 5 + 1 + 100 + 12 + 26 + 17 + 37 + 40 + 78 = 326 Climbing Mount Fuji: 6 / 326 * 100 = 1.84% Climbing Mont Blanc: 22/326*100 = 6.75% Climbing Kilimanjaro: 17/326*100 = 5.21% Climbing K2: 103/326*100 = 31.60% Climbing Everest: 178/326*100 = 54.60%
Input	Output	Comments
5 25 41 31 250 6	0.00% 1.70% 7.08% 8.78% 82.44%	All climbers: 25 + 41 + 31 + 250 + 6 = 353 Climbing Mount Fuji: 0 / 353 * 100 = 0.00% Climbing Mont Blanc: 6 / 353 * 100 = 1.78% Climbing Kilimanjaro: 25 / 353 * 100 = 7.08% Climbing K2: 31 / 353 * 100 = 8.78% Climbing Everest: 291 / 353 * 100 = 82.44%

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#6

8. Tennis Ranklist

Peter Parker is a tennis player whose next goal is to rise in the world rankings in men's tennis.

During the year Peter **participates in several tournaments**, receiving points for each tournament, which depend on the position in which he finished in the tournament. There are **three options** for completing a tournament:

- **W - if he is a winner, he receives 2000 points**
- **F - if he is a finalist, he receives 1200 points**
- **SF - if he is a semifinalist, he gets 720 points**

Write a program that calculates **how many points will Peter have after playing all the tournaments**, knowing how many **points the season starts with**. Also, calculate **how many points he won on average** in all tournaments played and **what percentage** of tournaments he has **won**.

Input Data

2 lines are read from the console:

- **Number of tournaments in which he participated - an integer in the range [1…20]**
- **The initial number of points in the rankings - an integer in the range [1...4000]**

For each tournament a row is read from the console:

- **Reached tournament stage – string – "W", "F", or "SF"**

Output Data

3 lines are printed on the console:

- **"Final points: {number of points after playing the tournament}"**
- **"Average points: {average points earned per tournament}"**
- **"{percentage of won tournaments}%"**

The average points should be rounded down to the nearest whole number, and the percentage should be formatted to the second digit after the decimal point.

Sample Input and Output

Input	Output	Comments
5 1400 F SF W W SF	Final points: 8040 Average points: 1328 40.00%	**5** tournaments and starting number of points: **1400** **1st** tournament -> final (**F**) -> points = **1400** + **1200** = **2600** **2nd** tournament -> semifinal (**SF**) -> points = **2600** + **720** = **3320** **3rd** tournament -> winner (**W**) -> points = **3320** + **2000** = **5320** **4th** tournament -> winner (**W**) -> points = **5320** + **2000** = **7320** **5th** tournament -> semifinal (**SF**) -> points = **7320** + **720** = **8040** **Points after playing tournaments: 8040** **Average tournament points earned:** (**1200** + **720** + **2000** + **2000** + **720**) / **5** = 6640 / **5** = 1328 **Number of won tournaments: 2**

Follow us:

		Percentage of tournaments won: (2 / 5) * 100 = 40 %	
Input	**Output**	**Input**	**Output**
4 750 SF W SF W	Final points: 6190 Average points: 1360 50.00%	7 1200 SF F W F W SF W	Final points: 11040 Average points: 1405 42.86%

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3694#7