Lab: Arrays

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

You can check your solutions here: https://judge.softuni.bg/Contests/172/Arrays-Lab.

1. Day of Week

Enter a **day number** [1…7] and print the **day name** (in English) or "**Invalid Day!**". Use an **array of strings**.

Examples

Input	Output
1	Monday
2	Tuesday
7	Sunday
0	Invalid Day!

Hints

- Use an **array of strings** holding the day names: {"Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday"}.
- Print the element at index (**day-1**) when it is in the range [1…7] or "**Invalid Day!**" otherwise.

2. Reverse an Array of Integers

Write a program to read **an array of integers**, **reverse** it and **print** its elements. The input consists of a **number n** (the number of elements) + **n** integers, each as a separate line. Print the output on a single line (space separated).

Examples

Input	Output
3 10 20 30	30 20 10
4 -1 20 99 5	5 99 20 -1

Hints

- First, read the number **n**.
- Allocate an array of **n** integers.
- Read the integers in a **for**-loop.
- Instead of reversing the array, you can just pass through the elements from the last (**n-1**) to the first (**0**) with a reverse **for**-loop.

3. Last K Numbers Sums Sequence

Enter two integers **n** and **k**. Generate and print the following sequence of **n** elements:

- The first element is: **1**
- All other elements = sum of the previous **k** elements (if less than **k** are available, sum all of them)
- Example: n = **9**, k = **5** → **120** = 4 + 8 + 16 + 31 + 61

Examples

Input	Output
6 3	1 1 2 4 7 13
8 2	1 1 2 3 5 8 13 21
9 5	1 1 2 4 8 16 31 61 120

Hints

- Use an **array of integers** to hold the sequence.
- Initially **`seq[0] = 1`**
- Use two nested loops:
  - Loop through all elements **`i`** = **1** … **n**
  - Sum the elements **`i-k`** … **`i-1`**: **`seq[i] = sum(seq[i-k … i-1])`**

4. Triple Sum

Write a program to read **an array of integers** and find all triples of elements **a**, **b** and **c**, such that **a** + **b** == **c** (where **a** stays to the left from **b**). Print "**No**" if no such triples exist.

Examples

Input	Output
1 1 1 1	No
4 2 8 6	4 + 2 == 6 2 + 6 == 8
2 7 5 0	2 + 5 == 7 2 + 0 == 2 7 + 0 == 7 5 + 0 == 5
3 1 5 6 1 2	3 + 2 == 5 1 + 5 == 6 1 + 1 == 2 1 + 2 == 3 5 + 1 == 6 1 + 2 == 3

Hints:

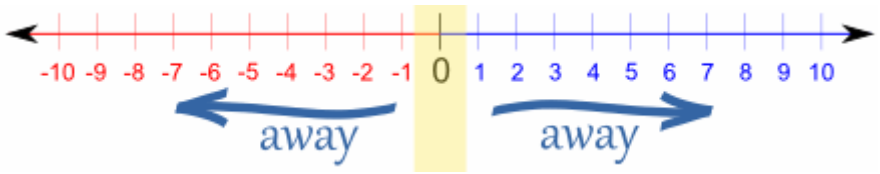
- Read the input numbers in array **`arr[]`**.
- Use nested loops to generate all pairs {**a**, **b**}, such that **0** ≤ **a** < **b** < **n**.
- Check whether **`arr[]`** contains the sum **`arr[a]`** + **`arr[b]`**.

5. Rounding Numbers Away from Zero

Write a program to read **an array of real numbers** (space separated values), **round** them to the nearest integer in "**away from 0**" style and **print** the output as in the examples below.

Rounding in "away from zero" style means:

- To round to the nearest integer, e.g. 2.9 → 3; -1.75 → -2
- In case the number is exactly in the middle of two integers (midpoint value), round it to the next integer which is away from the 0:



Examples

Input	Output

`0.9 1.5 2.4 2.5 3.14`	`0.9 => 1`
	`1.5 => 2`
	`2.4 => 2`
	`2.5 => 3`
	`3.14 => 3`

`-5.01 -1.599 -2.5 -1.50 0`	`-5.01 => -5`
	`-1.599 => -2`
	`-2.5 => -3`
	`-1.50 => -2`
	`0 => 0`

Hints:

- **Approach I**: Take the **absolute value** of each input number, add **0.5** and **truncate** the integral part. If the original number is negative, make the result also negative.
- **Approach II**: **Search in Internet** for **"rounding away from zero" + C#**. You should find a built-in C# method for rounding in many styles. Choose the "away from zero" rounding.

6. Reverse an Array of Strings

Write a program to read **an array of strings**, **reverse** it and **print** its elements. The input consists of a sequence of space separated strings. Print the output on a single line (space separated).

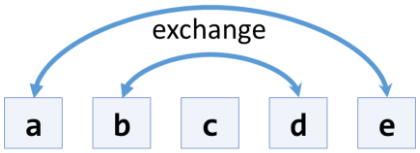
Examples

Input	Output
`a b c d e`	`e d c b a`
`-1 hi ho w`	`w ho hi -1`

Hints

- Read the array of strings.
- **Exchange** the **first** element (at index 0) with the **last** element (at index n-1).
- **Exchange** the **second** element (at index 1) with the element **before the last** (at index n-2).

- Continue the same way until the middle of the array is reached.



- Another, shorter approach, is to use the **`.Reverse()`** extension method from "**`System.Linq`**".

7. Sum Arrays

Write a program that reads two **arrays of integers** and sums them. When the arrays are not of the same size, duplicate the smaller array a few times.

Examples

Input	Output	Comments
1 2 3 4 2 3 4 5	3 5 7 9	1 2 3 4 + 2 3 4 5 = 3 5 7 9
1 2 3 4 5 2 3	3 5 5 7 7	1 2 3 4 5 + 2 3 2 3 2 = 3 5 5 7 7
5 4 3 2 3 1 4	7 7 4 9	5 4 3 5 + 2 3 1 4 + 7 7 4 9

Hints

- Assume the first array **`arr1`** has **`len1`** elements and the second **`arr2`** has **`len2`** elements.
- The result array will have **`max`**(**`len1`**, **`len2`**) elements.
- We sum array elements one by one (from the first to the last). To enable **rotating** (take the first element as next after the last), we use the **`position % length`** indexing: **`arr1[i % len1]`** and **`arr2[i % len2]`**.

8. Condense Array to Number

Write a program to read **an array of integers** and **condense** them by **summing** adjacent couples of elements until a **single integer** is obtained. For example, if we have 3 elements {2, 10, 3}, we sum the first two and the second two elements and obtain {2+10, 10+3} = {12, 13}, then we sum again all adjacent elements and obtain {12+13} = {25}.

Examples

Input	Output	Comments
2 10 3	25	2 10 3 → 2+10 10+3 → 12 13 → 12 + 13 → 25
5 0 4 1 2	35	5 0 4 1 2 → 5+0 0+4 4+1 1+2 → 5 4 5 3 → 5+4 4+5 5+3 → 9 9 8 → 9+9 9+8 → 18 17 → 18+17 → 35
1	1	1 is already condensed to number

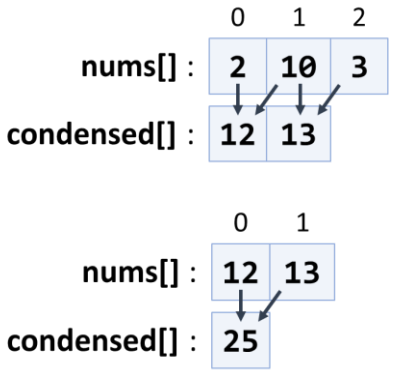
Hints

While we have more than one element in the array **`nums[]`**, repeat the following:

- Allocate a new array **`condensed[]`** of size **`nums.Length-1`**.

- Sum the numbers from **nums[]** to **condensed[]**:
    - **condensed[i] = nums[i] + nums[i+1]**
- **nums[] = condensed[]**

The process is illustrated below:



9. Extract Middle 1, 2 or 3 Elements

Write a method to extract the **middle 1**, **2** or **3 elements** from array of **n** integers and **print** them.

- **n** = 1 -> **1** element
- even **n** -> **2** elements
- odd **n** -> **3** elements

Create a program that reads an **array of integers** (space separated values) and prints the middle elements in the format shown in the examples.

Examples

Input	Output
5	{ 5 }
2 3 **8 1** 7 4	{ 8, 1 }
1 2 **3 4 5** 6 7	{ 3, 4, 5 }
10 20 30 **40 50** 60 70 80	{ 40, 50 }

Hints

- Write different logic for each case (n = 1, even n, odd n)
- n = 1 → take the first element
- odd n → take elements n/2-1, n/2, n/2+1
- even n → take elements n/2-1 and n/2