

Problem Set for CSC100

(Spring 2016)

Important Notes

- Exposure to mathematical formulas required for this problem set is assumed to be inherent.
- Students, who find unfamiliar terms or mathematical formulas in a problem's description, should search wiki or Google for better exposure.
- Programs written by students should be tested with all the provided test cases.
- Students should design their own test cases and test their programs using those test cases along with test cases provided.
- New problems will be added to this problem set as need arise to solve those problems. Students should look for an updated version of this problem set periodically.

1. Hello World

Display the text message “Hello World!!!” in the display.

Input:

No input is given to this program.

Output:

Output should be a single line containing the text “!!!Hello World!!!”

2. Echo

Take an integer from standard input device and show that integer on display subsequently.

Input:

Input is an integer N , $-2^{31} \leq N \leq 2^{31} - 1$.

Output:

Output should be a single line containing the integer given as input to the program.

Sample Input	Sample Output
2	2
0	0
-500000	-500000

3. Integer Calculator

You are given two integers. Display sum, differences, product, quotients and remainders of the two integers.

Input:

Inputs are two positive integer $n1$, $n2$.

Output:

For each pair of $n1$, $n2$ there will be 8 lines of output. Each line of output should have indication of operation followed by the results of operation as follows. Operations depending upon order of the operands must have results of both orders.

Sample Input	Sample Output
2 5	Sum: 7 Difference1: -3 Difference2: 3 Product: 10 Quotient1: 0 Quotient2: 2 Remainder1: 2 Remainder2: 1
15 2	Sum: 17 Difference1: 13 Difference2: -13 Product: 30 Quotient1: 7 Quotient2: 0 Remainder1: 1 Remainder2: 2

4. Grocery Store Calculator

You are given two numbers. Display results of addition, subtraction, multiplication, and division of given numbers.

Input:

Inputs are two numbers n1, n2.

Output:

For each pair of n1, n2 there will be 4 lines of output. Each line of output should have indication of operation followed by the results of operation as follows.

Sample Input	Sample Output
2.0 5.0	Addition: 7.0 Subtraction: -3.0 Multiplication: 10.0 Division: 0.4
15 2	Addition: 17.0 Subtraction: 13.0 Multiplication: 30.0 Division: 7.5

5. Arithmetic Expression

You are given x and y. Evaluate $x^2 + y^2 + 2xy + 30$.

Input:

Inputs are two numbers x, y.

Output:

Output should be a single line containing a number which is the result of evaluating the expression.

Sample Input	Sample Output
3 5	94
5.3 1.9	81.84

6. Euclidian Distance

You are given two Cartesian coordinates (x1, y1) and (x2, y2). Find distance between the coordinates.

Input:

Inputs are 4 numbers in the order x1, y1, x2, y2.

Output:

Output should be a single line containing a number which is the distance between given two coordinates.

Sample Input	Sample Output
3 5 2 5	1
0 0 90 100	134.536

7. Compound Interest

You are given present value of an investment p, interest rate r, and number of periods n. Find compound interest F, where $F = p * (1 + r)^n$.

Input:

Inputs are 3 positive numbers n, p, r.

Output:

Output is a number F.

Sample Input	Sample Output
5 30000 0.15	60340.7
3 30000 0.3	65910
3 10000 0.85	63316.3

8. Exponentiation

Given 3 numbers x, y, z . Evaluate the expression $x^{10} + y^{20} + z^{10} + \sqrt{xy} + \sqrt[x]{yz} + \sqrt[3]{z^5}$.

Input:

Inputs are 3 positive numbers x, y, z .

Output:

Output is a number which is the result of evaluating the expression.

Sample Input	Sample Output
2 3 4	1.013e+12
0.2 0.2 0.3	0.500001
1.5 1 0.5	61.0197

9. !!!To Sin or Not To Sin!!!

A tree was broken into two pieces during a hurricane. Lower part of the tree stands still and one side of the upper part hangs upon lower part and creates an angle of d degree with base. Length of the upper part is x meter. Find length of the lower part of the tree.

Input:

Inputs are 2 positive numbers x , and d . Angle d is in degree and $0^\circ \leq d \leq 90^\circ$.

Output:

Output is a positive number denoting the length of the lower part of the tree.

Sample Input	Sample Output
30 30	15
60 90	60
150 60	129.904

10. !!!Brown or Tan!!!

A ladder is inclined to a wall. Height of the wall is h meter and bottom of the latter is x meter away from the wall. Find the angle of inclination of the ladder with the wall.

Input:

Inputs are 2 positive numbers x , and h .

Output:

Output is a positive number denoting the angle of inclination of the ladder with the wall in degree.

Sample Input	Sample Output
30 30	45
60 0	90
100 5	87.1316

11. Need Cartesian???

Given a polar coordinate, convert this to a Cartesian coordinate.

Input:

Inputs are 2 positive numbers r and θ .

Output:

Output is the Cartesian version of the given coordinate in (X, Y) form.

Sample Input	Sample Output
8 0	(8, 0)
5 53.1301	(3, 4)
5 36.8699	(4, 3)

12. 3rd Digit

You are given an integer. Print 3rd digit, from the left, of the given integer.

Input:

Input is an integer n , $n \geq 100$.

Output:

Output is a digit, which lies in 3rd position from left side of n .

Sample Input	Sample Output
989	9
12322	3
1222	2

13. Fixed Digits

You are given an integer. Print digits of n.

Input:

Input is an integer n, $100000 \leq n \leq 999999$.

Output:

Outputs are digits of n from left to right, separated by spaces.

Sample Input	Sample Output
989123	3 2 1 9 8 9
111223	3 2 2 1 1 1
576894	4 9 8 6 7 5

14. Decimal Numbers

You are given 4 digits. Form a number using given digits. Also form reverse of the number.

Input:

Inputs are 4 single digit numbers d_1, d_2, d_3 , and d_4 . For $i=1, \dots, 4$, $0 \leq d_i \leq 9$.

Output:

Outputs are numbers $(d_1d_2d_3d_4)_{10}$ and $(d_4d_3d_2d_1)_{10}$.

Sample Input	Sample Output
9 8 2 1	9821 1289
0 1 2 3	123 3210
4 5 8 8	4588 8854

15. Reverse Number

You are given a number. Find the number formed by reversing order of the digits of given number.

Input:

Input is an integer n, $100000 \leq n \leq 999999$.

Output:

Output is the number formed by reversing order of the digits of n.

Sample Input	Sample Output
98221	12289
22235	53222
11220	2211

16. Triangle Area

Given three corner of a triangle in Cartesian coordinate, find area enclosed by the triangle. Use shoelace formula.

Input:

Inputs are 3 pairs of numbers x_1, y_1, x_2, y_2, x_3 , and y_3 .

Output:

Output is a positive number denoting the area enclosed by the triangle.

Sample Input	Sample Output
0 0 0 8 8 0	32
9 9 1 8 5 4	18
-1 0 0 1 1 0	1

17. Polygon Area

Given 8 corner coordinates of a polygon in Cartesian coordinate, find area enclosed by the polygon. Use shoelace formula.

Input:

Inputs are 8 pairs of numbers $x_1, y_1, x_2, y_2, x_3, y_3, x_4, y_4, x_5, y_5, x_6, y_6, x_7, y_7, x_8$, and y_8 .

Output:

Output is a positive number denoting the area enclosed by the given coordinates.

Sample Input	Sample Output
0 0 2 0 4 0 8 0 8 8 4 8 2 8 0 8	64
-8 0 0 0 0 -4 4 0 8 0 8 8 -8 8 -12 4	152
-2 0 2 0 2 4 1 4 1 6 -1 6 -1 4 -2 4	20

18. Triangular Number

You are given a positive integers n , find sum of natural numbers from 1 to n .

Input:

Input is a positive integer n.

Output:

Output is sum of natural number from 1 to n.

Sample Input	Sample Output
5	15
20	210

$$19. \quad 1^2 + 2^2 + \dots + n^2 = ?$$

You are given a positive integers n, find sum of square of natural numbers from 1 to n.

Input:

Input is a positive integer n.

Output:

Output is sum of square of natural numbers from 1 to n.

Sample Input	Sample Output
5	55
20	2870

$$20. \quad 1^3 + 2^3 + \dots + n^3 = ?$$

You are given a positive integers n, find sum of cube of natural numbers from 1 to n.

Input:

Input is a positive integer n.

Output:

Output is sum of cube of natural numbers from 1 to n.

Sample Input	Sample Output
5	225
20	44100

$$21. \quad a + ar + ar^2 \dots + ar^{n-1} = ?$$

You are given a positive integers n, initial terms and common ratio of successive terms of a geometric series, find sum of the series.

Input:

Inputs are initial term “a”, common ratio of successive terms “r”, and a positive integer n.

Output:

Output is sum of the seires.

Sample Input	Sample Output
1 2 5	31
1 -2 5	11
2 0.5 4	3.75
5 1 5	25
15 -1 5	15
15 -1 16	0

22. $a + ar + ar^2 \dots + \infty = ?$

You are given initial terms and common ratio of successive terms of an infinite geometric series, find sum of the series.

Input:

Inputs are initial term “a”, and common ratio of successive terms “r”.

Output:

Output is sum of the series if series is convergent; otherwise “No Sum: Divergent Series”.

Sample Input	Sample Output
5 10	10
1 5	No Sum: Divergent Series
10 -0.25	8
22 -5	No Sum: Divergent Series



23. Binary Modulo

You are given an integer. Print whether it is even or odd.

Input:

Input is an integer n.

Output:

“n is even”, or “n is odd” depending on n.

Sample Input	Sample Output
5	5 is odd
88	88 is even
17	17 is odd

24. K Modulo

You are given two integers. Print whether the first integer is divisible by second.

Input:

Inputs are integers n, and k.

Output:

“k divides n”, or “k does not divide n” depending on the outcome of divisibility test.

Sample Input	Sample Output
5 3	3 does not divide 5
91 8	7 divides 91
55 12	12 does not divide 55

25. Any Factor???

You are given four integers. Print whether the first integer is divisible by any of the later integers.

Input:

Inputs are integers n, k1, k2, and k3.

Output:

“Given integers contain a factor of n” or “Given integers do not contain a factor of n” depending on the outcome of divisibility test.

Sample Input	Sample Output
89 9 5 7	Given integers do not contain a factor of 89
91 8 2 3	Given integers contain a factor of 91
19 2 3 5	Given integers do not contain a factor of 19

26. All Factors???

You are given four integers. Print whether the first integer is divisible by all of the later integers.

Input:

Inputs are integers n, k1, k2, and k3.

Output:

"k1, k2, k3" are factors of n" or "All factors test failed" depending on the outcome of divisibility test.

Sample Input	Sample Output
24 2 8 3	2 8 3 are factors of 24
104 8 13 4	8 13 4 are factors of 104
15 5 3 2	All factors test failed

27. Real Line? Where??

You are given a number. Print whether the number is less than equal or greater than 100.

Input:

Input is a number r.

Output:

"r is less than 100", or "r equals 100", or "r is greater than 100" depending on r's value.

Sample Input	Sample Output
5.5	5.5 is less than 100
165	165 is greater than 100
100	100 equals 100

28. Flexible Real Line

You are given two numbers. Print whether the first number is less than or equal or greater than second number.

Input:

Inputs are numbers r , and k .

Output:

" r is less than k ", or " r equals k ", or " r is greater than k " depending on values of r and k .

Sample Input	Sample Output
5.5 4	5.5 is greater than 4
165 200	165 is less than 200
10 10	10 equals 10

29. One Weigh More!??

You are given three numbers. Check whether sum of any two numbers is less than the other number.

Input:

Inputs are 3 numbers r_1 , r_2 , and r_3 .

Output:

" $r_1+r_2<r_3$ ", or " $r_2+r_3<r_1$ ", or " $r_3+r_1<r_2$ ", or "One does not weigh more" depending on the outcomes of checking on r_1 , r_2 , and r_3 .

Sample Input	Sample Output
3 1 2	One does not weigh more
4 2 1	$2+1<4$
4 9 17	$4+9<17$
6.5 8.5 1	$1+6.5<8.5$
2 2 1	One does not weigh more

30. Triangle or Not

Given three sides of a triangle, check whether this is a valid triangle or not. If valid then find the area of the triangle.

Input:

Inputs are 3 numbers a , b , and c .

Output:

A single line, containing the area of the triangle if given a , b , c form a valid triangle or "Invalid sides for triangle", if a , b , c are invalid to form a triangle.

Sample Input	Sample Output
3 1 2	Invalid sides for triangle
4 3 5	6

4 9 17	Invalid sides for triangle
5 6 5	12
8 5.5 4.5	11.9059

31. Straight Line

You are given two Cartesian coordinates. You need to find equation of the line passing through these coordinates.

Input:

Inputs are 4 numbers x_1 , y_1 , x_2 , and y_2 .

Output:

A single line, containing equation of the line in $Y=mX+c$ format. In the case of lines being parallel to Y-axis the format should be $X=b$.

Sample Input	Sample Output
0 0 2 8	$Y=4X$
2 4 2 8	$X=2$
2 0 0 2	$Y=-X+2$
4 2 8 2	$Y=2$
0 2 2 8	$Y=3X+2$
2 -2 4 6	$Y=4X-10$

32. Lines' Intersection

Given equation of two lines: $Y=m_1X+c_1$ and $Y=m_2X+c_2$. Find intersection point of the lines. If intersection does not exist, you need to state whether the lines are parallel or same.

Input:

Inputs are 4 numbers m_1 , c_1 , m_2 , and c_2 .

Output:

A single line, containing intersection (X, Y) of given lines if exist; or "Parallel" in the case of lines being parallel; or "Same" in the case of lines being same.

Sample Input	Sample Output
2 0 2 2	Parallel
-5 0 -5 0	Same
3 2 4 0	(2, 8)
0 2 3 2	(0, 2)

33. Polynomial Roots

You are given coefficients of a quadratic equation $ax^2 + bx + c = 0$. Find root(s) of the equation.

Input:

Inputs are 3 numbers a, b, and c, $a \neq 0$.

Output:

Root(s) of the equation separated by a comma and a space.

Sample Input	Sample Output
1 2 3	-1+1.41421i, -1-1.41421i
1 2 1	-1
1 -6 5	1, 5
2 4 4	-1+i, -1-i
1 6 5	-1, -5
1-6 10	3+i, 3-i

34. Circle's Equation

You are given center of circle and a coordinate on the circle. Print equation of the circle.

Input:

Inputs are 4 numbers h, k, a, and b. Here (h, k) is the center of the circle and (a, b) is a point on the circle.

Output:

Equation of the circle in $(x - h)^2 + (y - k)^2 = r^2$ form.

Sample Input	Sample Output
0 0 4 0	$X^2+Y^2=4^2$
0 4 0 8	$X^2+(Y-4)^2=4^2$
1 -2 5 -2	$(X-1)^2+(Y+2)^2=4^2$
4 0 2 0	$(X-4)^2+Y^2=2^2$

35. !!!Circle, circle Dot, dot!!!

You are given center and radius of circle and a coordinate. Print where the coordinate lies inside the circle, on the circle or outside of the circle.

Input:

Inputs are 5 numbers h, k, r, a, and b. Here (h, k) is the center and r is the radius of the circle and (a, b) is a coordinate.

Output:

“Inside Circle”, “On Circle” or “Outside Circle” depending on (a, b)’s position relative to the given circle.

Sample Input	Sample Output
0 0 4 2 0	Inside Circle
0 0 4 0 4	On Circle
0 0 4 8 8	Outside Circle
4 4 5 0 0	Outside Circle

36. Ascending

You are given two numbers. Print those in ascending order.

Input:

Inputs are 2 numbers n1, and n2.

Output:

A single line, containing n1 and n2 in ascending order.

Sample Input	Sample Output
5 20	5 20
20 5	5 20
6.5 2.5	2.5 6.5
38.5 55.6	38.5 55.6

37. Extremities

You are given 6 numbers. Print maximum and minimum of those numbers.

Input:

Inputs are 6 numbers n1, n2, n3, n4, n5, and n6.

Output:

A single line, containing maximum and minimum of given numbers separated by space.

Sample Input	Sample Output
5 6 2 18 7 12	12 2
5.5 5.6 2.1 1.2 1.3 5.4	5.6 1.2

38. Total Ordering

You are given three numbers. Print those numbers in descending order.

Input:

Inputs are 3 numbers n1, n2, and n3.

Output:

A single line, containing n1, n2, and n3 in descending order.

Sample Input	Sample Output
1 2 3	3 2 1
1 3 2	3 2 1
2 1 3	3 2 1
2 3 1	3 2 1
3 1 2	3 2 1
3 2 1	3 2 1
3.9 5.9 2.1	5.9 3.9 2.1

39. Count in a Range

You are given 4 positive integers, b1, b2, b3, and n. If n lies in the range 0 (inclusive) to b1 (exclusive) print number of integers in that range 0 (inclusive) to b1 (exclusive). If n lies in the range b1 (inclusive) to b2 (exclusive), print number of integers in the range b1 (inclusive) to b2 (exclusive). If n lies in the range b2 (inclusive) to b3 (inclusive), print number of integers in the range b2 (inclusive) to b2 (inclusive). Else print "Greater than first C numbers", where C is the number of integers lies between 0 (inclusive) and b3 (inclusive).

Input:

Inputs are 4 positive integer b1, b2, b3, and n, $b1 < b2 < b3$.

Output:

A single line, containing the number of integers in the range where n lies.

Sample Input	Sample Output
6 10 20 5	6
6 10 20 7	4
6 10 20 15	11
6 10 20 22	Greater than first 21 numbers

40. Anomaly in Calendar

You are given a positive integer, denoting a year in the Gregorian calendar. Determine whether the given year is a leap year or not.

Input:

Input is a positive integer Y .

Output:

A single line, describing whether Y is a leap year or not.

Sample Input	Sample Output
2004	2004 is a leap year
1900	1900 is a not leap year
2400	2400 is a leap year
1800	1800 is not a leap year

41. Grade

You are given a number; convert this number into letter grade.

Input:

Input is a number X , $0 \leq X \leq 100$.

Output:

"A" if $X \geq 80$, "B" if $70 \leq X < 80$, "C" if $60 \leq X < 70$, "D" if $50 \leq X < 60$, "F" if $X < 50$.

Sample Input	Sample Output
55	D
95	A
65	C
49	F

42. !!!Fake Casio fx-series!!!

Make a scientific calculator with limited functionalities.

Input:

First input is a character C , to choose an operator. C follows a single operand A or two operands A , and B depending on the type of operators. Characters and their mapping to operations are as follows:

Characters	Operations
+	$A+B$
-	$A-B$
*	$A*B$
/	A/B
%	$A\%B$
^	A^B
S	$\sin(A)$
C	$\cos(A)$
T	$\tan(A)$
G	$\log(A)$
L	$\ln(A)$
R	\sqrt{A}
Q	$\sqrt[B]{A}$
I	A^{-1}
A	$\sin^{-1} A$
B	$\cos^{-1} A$
N	$\tan^{-1} A$
E	e^A
X	A^2
Y	A^3
D	10^A

Output:

Result of the operations depending on C, and A or C, A, and B. Special instruction need to be provided to the user of the program in the case of given operands being illegal for the chosen operator.

43. Un-Intersect-ion

You are given 2 sets of 4 integers, print union and intersection of the sets.

Input:

Inputs are 8 integers first 4 integers belong to a set and last 4 integers belong to other set.

Output:

Output is result of union followed by result of intersection, separated by a new line.

Sample Input	Sample Output
1 2 5 6 2 3 4 5	1 2 5 6 3 4 2 5
10 20 30 40 -10 10 50 60	10 20 30 40 -10 50 60 10

44. Balls in Jars

You are given 3 jars of tennis balls, each having at least one ball. Can you pick unique number of balls from each jar?

For example if jars have 5, 6 and 8 balls then we can pick 1 ball from 1st jar, 2 balls from 2nd jar, and 5 balls from 3rd jar or 5 balls from 1st jar, 6 balls from 2nd jar, and 7 balls from 3rd jar. But we cannot pick 5 balls from each jar or 4 balls from 1st jar and 6 balls from 2nd and 3rd jar.

Input:

Inputs are 3 positive integer n_1 , n_2 , and n_3 , denoting numbers of balls in 3 jars.

Output:

Output is "Yes", if unique numbers of balls can be chosen from the jars having n_1 , n_2 , n_3 numbers of balls; otherwise "No".

Sample Input	Sample Output
5 6 8	Yes
2 2 2	No
4 4 1	Yes
2 1 2	No



45. Increment

You are given a positive integer; print the sequence 1...n.

Input:

Input is an integer n , $n > 1$.

Output:

The sequence 1 to n separated by spaces.

Sample Input	Sample Output
2	1 2
10	1 2 3 4 5 6 7 8 9 10

46. Decrement

You are given a positive integer; print the sequence n...1.

Input:

Input is an integer n, $n > 1$.

Output:

The sequence n to 1 separated by spaces.

Sample Input	Sample Output
2	2 1
10	10 9 8 7 6 5 4 3 2 1

47. Increment with Starter

You are given integers n1, n2 and $n1 < n2$; print the sequence n1, n1+1, n1+2, ... n2-2, n2-1, n2.

Input:

Inputs are integers n1, n2, $n1 < n2$.

Output:

The sequence n1 to n2 separated by spaces.

Sample Input	Sample Output
2 8	2 3 4 5 6 7 8
-5 5	-5 -4 -3 -2 -1 0 1 2 3 4 5

48. Bounded Decrement

You are given integers n1, n2 and $n1 > n2$; print the sequence n1, n1-1, n1-2, ... n2+2, n2+1, n2.

Input:

Inputs are integers n1, n2, $n1 > n2$.

Output:

The sequence n1 to n2 separated by spaces.

Sample Input	Sample Output
8 2	8 7 6 5 4 3 2
5 -5	5 4 3 2 1 0 -1 -2 -3 -4 -5

49. MINMAX

You are given integer n and n pairs of integers follows. Each pair consists of an id and a score. Find pairs with minimum and maximum score.

Input:

First line of inputs contains an integer n and n pairs of id, score follows each in a separate line.

Output:

2 pairs of id and score separate a new line, where 1st pair has minimum score and 2nd pair has maximum score. Id and score are separated by space.

Sample Input	Sample Output
5 101 50 110 75 109 85 102 45 105 55	102 45 109 85
3 2222 200 5555 600 9999 800	2222 200 9999 800

50. Counting in Static Range

You are given integer n and n numbers. Count how many numbers are negative, zero and positive among n integers.

Input:

Inputs are integers n and n numbers follows.

Output:

3 integers separated by spaces and indicating count of negative numbers, zeros and positive numbers.

Sample Input	Sample Output
6 2 -2 3 -3 5 6	2 0 4
10 5 6 7 8 0 -1 2 0 6 7 1.5	1 2 7

51. Counting in Dynamic Range

You are given integers n , r_1 , r_2 , r_3 and n numbers. Count how many numbers are less than r_1 (exclusive), between r_1 (inclusive) and r_2 (exclusive), between r_2 (inclusive) and r_3 (inclusive), and greater than r_3 .

Input:

Inputs are integer n , r_1 , r_2 , r_3 and n numbers follows. Here $r_1 < r_2 < r_3$.

Output:

4 integers separated by spaces and indicating count of numbers less than r_1 (exclusive), between r_1 (inclusive) and r_2 (exclusive), between r_2 (inclusive) and r_3 (inclusive), and greater than r_3 .

Sample Input	Sample Output
10 5 8 20 90 -5 6 2 3 10 25 34 7 20 8	3 2 3 2
10 -2 10 70 5 6 7 8 0 -1 2 0 67 1.5	0 9 1 0

52. ABC's of Counting

You are given integers n , n characters. Characters are only 'A', 'B' or 'C'. Count how many 'A's', 'B's, and 'C's belong to n character.

Input:

Inputs are integers n , and n characters. Each character is either an 'A' or a 'B' or a 'C'.

Output:

3 integers, 1st is the count of no. of 'A's, 2nd is the count of no. of 'B's and, 3rd is the count of no. of 'C's.

Sample Input	Sample Output
10 A B C A B C A B C A	4 3 3
10 B B B B A A C C C B	2 5 3

53. Permutation

You are given a positive integer n , print factorial of n .

Input:

Input is an integer n , $n > 0$.

Output:

Factorial of n.

Sample Input	Sample Output
5	125
3	5
12	479001600

54. Combination

You are given positive integers n and r, print nC_r .

Input:

Input is an integer n, r, $n, r > 0$.

Output:

Value of nC_r .

Sample Input	Sample Output
15 2	105
5 3	10
15 9	5005

55. Number from Digits

You are given integers n, n digits d_1, d_2, \dots, d_n . Find $(d_1, d_2, \dots, d_n)_{10}$ and $(d_n, d_{n-1}, \dots, d_1)_{10}$.

Input:

Inputs are positive integers n, and n digits d_1, d_2, \dots, d_n , where $0 \leq d_i \leq 9$ for $i = 1 \dots n$.

Output:

The numbers $(d_1, d_2, \dots, d_n)_{10}$ and $(d_n, d_{n-1}, \dots, d_1)_{10}$ separated by comma and a space.

Sample Input	Sample Output
4 5 6 2 3	5623, 3265
9 1 4 5 6 2 3 7 8 0	145623780, 87326541
2 0 5 6	56, 650

56. Digits from Number

You are given an integer, print digits of the integer.

Input:

Input is an integer n of the form $(d_1 d_2 \dots d_n)_{10}$, $n \geq 0$

Output:

The digits of n separated by spaces in the order d_1, d_2, \dots, d_n as well as in the order d_n, d_{n-1}, \dots, d_1 . Two ordering of the digits should be separated by a comma.

Sample Input	Sample Output
5678	5 6 7 8, 8 7 6 5
143520	1 4 3 5 2 0, 0 2 5 3 4 1

57. Factors

You are given a positive integer, n . Print factors of n .

Input:

Input is an integer n , $n > 1$.

Output:

Factors of n , separated by spaces.

Sample Input	Sample Output
15	3 5
24	2 3 4 6 8 12
89	

58. Odd Factors

You are given a positive integer, n . Print odd factors of n .

Input:

Input is an integer n , $n > 1$.

Output:

Odd factors of n , separated by spaces.

Sample Input	Sample Output
37	
24	3
30	3 5 15

59. Even Factors

You are given a positive integer, n . Print even factors of n .

Input:

Input is an integer n , $n > 1$.

Output:

Even factors of n , separated by spaces.

Sample Input	Sample Output
24	2 4 6 8 14
29	
20	2 4 10

60. Sum of Factors

You are given 3 positive integers m , n , and p where $m < n$. Find sum of the multiples of p between m (exclusive), and n (inclusive).

Input:

Inputs are 3 positive integer m , n , and p ; $m < n$.

Output:

Output is single line containing sum of the multiples of p between m (exclusive) and n (inclusive).

Sample Input	Sample Output
2 10 2	28
1 100 81	81
5 25 35	0
3 17 4	40

61. !!!isPrime!!!

Given a positive integer check whether the given integer is prime or not.

Input:

Input is an integer n , $n > 1$.

Output:

A single line, containing the text “n is a prime number”, if n is prime or the text “n is a composite number”, if n is not prime.

Sample Input	Sample Output
91	91 is a composite number
89	89 is a prime number
5039	5039 is a prime number

62. !!!isPerfect!!!

Given a positive integer check whether the given integer is perfect or not. To be perfect a number has to be equal to sum of its proper positive divisors.

Input:

Input is an integer n , $n > 1$.

Output:

A single line, containing the text “n is a perfect number”, if n is perfect or the text “n is not a perfect number”, if n is not perfect.

Sample Input	Sample Output
28	28 is a perfect number
10	10 is not a perfect number
496	496 is a perfect number

63. Digits' Sum

You are given a positive integer, print sum of the digits of the integer.

Input:

Input is an integer n , $n \geq 0$.

Output:

A single line, containing the sum of the digits of given integer.

Sample Input	Sample Output
28	10
121121	8
996	24

64. !!!isPalindrome!!!

Given a positive integer check whether the given integer is palindrome or not. If the digits of the given number are reversed and this digits reversed number is equal to the given number then it is a palindrome otherwise not.

Input:

Input is an integer n , $n \geq 0$.

Output:

A single line, containing the text “ n is a palindrome number”, if n is palindrome or the text “ n is not a palindrome number”, if n is not palindrome.

Sample Input	Sample Output
28	28 is a perfect number
10	10 is not a perfect number
496	496 is a perfect number

65. !!!isUgly!!!

Given a positive integer check whether the given integer is ugly or not. Ugly numbers are numbers whose prime factors are only 2, 3, and 5.

Input:

Input is an integer n , $n > 0$.

Output:

A single line, containing the text “ n is an ugly number”, if n is ugly or the text “ n is not a ugly number”, if n is not an ugly number.

Sample Input	Sample Output
2	2 is an ugly number
28	28 is not an ugly number
15	15 is an ugly number

66. Prime Factorization

You are given a positive integer check whether the given integer can be factorized using only 2, 3, 5, and 7.

Input:

Input is an integer n , $n > 0$.

Output:

" $n=(2^p)*(3^q)*(5^r)*(7^s)$ " if n can be factorized using only 2, 3, 5, and 7; otherwise " n cannot be factorized by primes 2, 3, 5, and 7 only".

Sample Input	Sample Output
2	$2=(2^1)*(3^0)*(5^0)*(7^0)$
5	$5=(2^0)*(3^0)*(5^1)*(7^0)$
420	$420=(2^2)*(3^1)*(5^1)*(7^1)$
121	121 cannot be factorized by primes 2, 3, 5, and 7 only

67. Fibonacci

You are given a positive integer n , print first n numbers from Fibonacci sequence.

Input:

Input is an integer n , $n > 0$.

Output:

First n numbers of Fibonacci sequence.

Sample Input	Sample Output
5	0 1 1 2 3
8	0 1 1 2 3 5 8 13
12	0 1 1 2 3 5 8 13 21 34 55 89 144

68. Binomial Theorem 1

You are given a number x , $|x| < 1$ and positive integer t . Find sum of the following series summing only first t terms:

$$1 + x + x^2 + x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t , $|x| < 1$, $t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	1.9375
0.5 18	1.99999
0.5 100	2

69. Binomial Theorem 2

You are given a number x , $|x| < 1$ and positive integer t . Find sum of the following series summing only first t terms:

$$1 - x + x^2 - x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t , $|x| < 1, t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	0.6875
0.5 20	0.66666
0.5 100	0.66667

70. Binomial Theorem 3

You are given a number x , $|x| < 1$ and positive integer t . Find sum of the following series summing only first t terms:

$$1 + 2x + 3x^2 + 4x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t , $|x| < 1, t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	3.5625
0.5 23	3.99999
0.5 100	4

71. Binomial Theorem 4

You are given a number x , $|x| < 1$ and positive integer t . Find sum of the following series summing only first t terms:

$$1 - 2x + 3x^2 - 4x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t, $|x| < 1, t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	0.5625
0.5 27	0.44445
0.5 100	0.44444

72. Binomial Theorem 5

You are given a number x, $|x| < 1$ and positive integer t. Find sum of the following series summing only first t terms:

$$1 + 3x + 6x^2 + 10x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t, $|x| < 1, t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	6.1875
0.5 27	7.99999
0.5 100	8

73. Binomial Theorem 6

You are given a number x, $|x| < 1$ and positive integer t. Find sum of the following series summing only first t terms:

$$1 - 3x + 6x^2 - 10x^3 + \dots + \infty$$

Input:

Inputs are number x and integer t, $|x| < 1, t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
0.5 5	0.6875
0.5 29	0.296297
0.5 100	0.296296

74. Exponential Expansion 1

You are given a number x , and positive integer t . Find sum of the following series summing only first t terms:

$$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots + \infty$$

Input:

Inputs are number x and integer t , $t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
1 5	2.70833
1 100	2.71828
2 100	7.38906

75. Exponential Expansion 2

You are given a number x , and positive integer t . Find sum of the following series summing only first t terms:

$$1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \cdots + \infty$$

Input:

Inputs are number x and integer t , $t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
1 5	0.375
1 100	0.367879
2 100	0.135335

76. Trigonometric Expansion 1

You are given a number x , and positive integer t . Find sum of the following series summing only first t terms:

$$1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \dots + \infty$$

Input:

Inputs are number x and integer t , $t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
3.1416 7	-0.9999
3.1416 8	-1
12.5664 100	1

77. Trigonometric Expansion 2

You are given a number x , and positive integer t . Find sum of the following series summing only first t terms:

$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \dots + \infty$$

Input:

Inputs are number x and integer t , $t > 0$.

Output:

Sum of 1st t terms of the series.

Sample Input	Sample Output
1.57 4	0.999843
1.57 5	1
4.71 10	-1

78. Arithmetic Progression 1

You are given initial terms and common difference of successive terms of an arithmetic series and a positive integer n . Print the series up to n^{th} term.

Input:

Inputs are initial terms a, common difference d, and number of terms n.

Output:

Series defined by “a” and “d” with sum as follows:

$a+(a+d)+(a+2d)+\dots+(a+(n-1)d) = \text{Sum}$, where “Sum” is the sum of n terms of the series.

Sample Input	Sample Output
5 4 10	$5+9+13+17+21+25+29+33+37+41 = 230$
2.3 3.5 8	$2.3+5.8+9.3+12.8+16.3+19.8+23.3+26.8 = 116.4$
-50 10 11	$-50-40-30-20-10+0+10+20+30+40+50 = 0$

79. Arithmetic Progression 2

You are given positive integer m, n, m^{th} term, and common difference of successive terms of an arithmetic series. Print the series starting at m^{th} term and ending at n^{th} term.

Input:

Inputs are positive integers m, m^{th} term a_m , common difference d, and n.

Output:

Series defined by “m”, “d”, and “ a_m ” with sum as follows:

$a+(a+d)+(a+2d)+\dots+(a+md)+\dots+(a+(n-1)d) = \text{Sum}$, where “a” is initial term and “Sum” is the sum of n terms of the series.

Sample Input	Sample Output
3 13 4 10	$5+9+13+17+21+25+29+33+37+41 = 230$
9 30.3 3.5 8	$2.3+5.8+9.3+12.8+16.3+19.8+23.3+26.8 = 116.4$
4 -20 10 11	$-50-40-30-20-10+0+10+20+30+40+50 = 0$

80. Geometric Series

You are given an integer n, initial term, and ratio of successive terms of a geometric series. Print the series up to n^{th} term. In the cases when n is not positive, assume the series has infinite terms.

Input:

Inputs are initial terms a, ratio of successive terms r, and an integer n.

Output:

In the cases when series has finite terms print the series defined by “a”, “r”, with sum as follows:

$a+(ar)+(ar^2)+\dots+(ar^{(n-1)}) = \text{Sum}$, where “Sum” is the sum of n terms of the series.

In the cases when series has infinite terms but convergent print 1st 5 terms of the series defined by “a”, “r”, with sum as follows:

$a+(ar)+(ar^2)+(ar^3)+(ar^4)+\dots = \text{Sum}$, where “Sum” is the sum of infinite terms of the series.

In the cases of infinite divergent series print “Divergent infinite series”

Sample Input	Sample Output
1 2 5	1+2+4+8+16 = 31
20 -2 5	20-40+80-160+320 = 220
10 0.5 5	10+5+2.5+1.25+0.625 = 19.375
15 0.5 -9	15+7.5+3.75+1.875+0.9375+... = 30
20 -0.5 0	20-10+5-2.5+1.25-... = 13.3333
25 2 0	Divergent infinite series

81. Central Tendency

You are given a positive integers n followed by n numbers. Find mean of given numbers.

Input:

Inputs are a positive integer n, followed by n numbers, $x_1 x_2 \dots x_n$ and $n > 0$.

Output:

Mean value of given n numbers.

Sample Input	Sample Output
5 1 2 3 4 5	3
10 -2 3 5 6 -10 7.5 3 9 0 1	2.25

82. n-Polygon Area

You are given coordinates of a polygon. Find area enclosed by the polygon.

Input:

Inputs are a positive integer n, followed by n pairs of number, $x_1 y_1 x_2 y_2 \dots x_n y_n$ and $n > 2$.

Output:

Area enclosed by the given coordinates.

Sample Input	Sample Output
8 0 0 2 0 4 0 8 0 8 8 4 8 2 8 0 8	64
4 4 0 8 0 8 4 4 8	24
8 -8 0 0 0 0 -4 4 0 8 0 8 8 -8 8 -12 4	152
4 -4 0 8 0 8 8 0 8	80
8 -2 0 2 0 2 4 1 4 1 6 -1 6 -1 4 -2 4	20



83. Primes

You are given a positive integer n . Print primes numbers up to n .

Input:

Input is a positive integer n .

Output:

Primes numbers up to n , separated by spaces.

Sample Input	Sample Output
5	2 3 5
10	2 3 5 7
20	2 3 5 7 11 13 17 19

84. n-Primes

You are given a positive integer n . Print 1st n prime numbers.

Input:

Input is a positive integer n .

Output:

1st n primes, separated by spaces.

Sample Input	Sample Output
3	2 3 5
4	2 3 5 7
8	2 3 5 7 11 13 17 19

85. n-Palindromes

You are given a positive integer n. Print 1st n palindrome numbers.

Input:

Input is a positive integer n.

Output:

1st n palindromes, separated by spaces.

Sample Input	Sample Output
3	1 2 3
10	1 2 3 4 5 6 7 8 9 11
20	1 2 3 4 5 6 7 8 9 11 22 33 44 55 66 77 88 99 101 111

86. Palindromes

You are given a positive integer n. Print palindrome numbers up to n.

Input:

Input is a positive integer n.

Output:

Palindrome numbers up to n, separated by spaces.

Sample Input	Sample Output
2	1 2
13	1 2 3 4 5 6 7 8 9 11
125	1 2 3 4 5 6 7 8 9 11 22 33 44 55 66 77 88 99 101 111 121

87. n-Ugly

You are given a positive integer n. Print 1st n ugly numbers.

Input:

Input is a positive integer n.

Output:

1st n Ugly numbers, separated by spaces.

Sample Input	Sample Output
--------------	---------------

2	1 2
10	1 2 3 4 5 6 8 9 10 12
20	1 2 3 4 5 6 8 9 10 12 15 16 18 20 24 25 27 30 32 36

88. Humble Numbers

You are given a positive integer n . Print 1st n humble numbers. Humble numbers are numbers whose prime factors are only 2, 3, 5, and 7.

Input:

Input is a positive integer n .

Output:

1st n humble numbers, separated by spaces.

Sample Input	Sample Output
3	1 2 3
10	1 2 3 4 5 6 7 8 9 10
20	1 2 3 4 5 6 7 8 9 10 12 14 15 16 18 20 21 24 25 27

89. Greatest Common Divisor

You are given a positive integers m , and n . Find greatest common divisor (GCD) of m , n .

Input:

Inputs are a positive integer m , n .

Output:

GCD of m , n .

Sample Input	Sample Output
5 13	1
30 18	6
12 24	12

90. GCD Euclid

You are given a positive integers m , and n . Find greatest common divisor (GCD) of m , n using Euclid's algorithm.

Input:

Inputs are a positive integer m , n .

Output:

GCD of m, n.

Sample Input	Sample Output
5 13	1
30 18	6
12 24	12

91. Least Common Multiple

You are given a positive integers m, and n. Find least common multiple (LCM) of m, n.

Input:

Inputs are a positive integer m, n.

Output:

LCM of m, n.

Sample Input	Sample Output
5 13	65
30 18	90
12 24	24

92. LCM from GCD

You are given a positive integers m, and n. Find least common multiple (LCM) of m, n from GCD of m, n. For finding GCD use Euclid's algorithm.

Input:

Inputs are a positive integer m, n.

Output:

LCM of m, n.

Sample Input	Sample Output
5 13	65
30 18	90
12 24	24

93. 3-LCM

You are given 3 positive integers. Find least common multiple (LCM) of 3 integers.

Input:

Inputs are 3 positive integers.

Output:

LCM of given 3 integers.

Sample Input	Sample Output
2 30 18	90
5 3 2	30

94. Cartesian product

You are given two positive integer n_1 , and n_2 . Now assume sets $A=\{1, 2, \dots, n_1\}$ and $B=\{1, 2, \dots, n_2\}$. Print Cartesian product of sets A and B.

Input:

Inputs are positive integer n_1 , and n_2 .

Output:

$\{1, 2, \dots, n_1\} \times \{1, 2, \dots, n_2\} = \{(1, 1), (1, 2), \dots, (1, n_2), (2, 1), \dots, (2, n_2), \dots, (n_1, 1), \dots, (n_1, n_2)\}$.

Sample Input	Sample Output
2 4	$\{1, 2\} \times \{1, 2, 3, 4\} = \{(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (2, 4)\}$
4 3	$\{1, 2, 3, 4\} \times \{1, 2, 3\} = \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (4, 1), (4, 2), (4, 3)\}$

95. 3-Tuples

You are given three positive integers n_1 , and n_2 , n_3 . Now assume sets $A=\{1, 2, \dots, n_1\}$, $B=\{1, 2, \dots, n_2\}$, $C=\{1, 2, \dots, n_3\}$. Print Cartesian product of sets A, B, and C.

Input:

Inputs are positive integer n_1 , n_2 , and n_3 .

Output:

$\{1, 2, \dots, n_1\} \times \{1, 2, \dots, n_2\} \times \{1, 2, \dots, n_3\} = \{(1, 1, 1), (1, 1, 2), \dots, (1, 1, n_3), (1, 2, 1), \dots, (n_1, n_2, 1), \dots, (n_1, n_2, n_3)\}$.

Sample Input	Sample Output
2 2 3	$\{1, 2\} \times \{1, 2\} \times \{1, 2, 3\} = \{(1, 1, 1), (1, 1, 2), (1, 1, 3), (1, 2, 1), (1, 2, 2), (1, 2, 3), (2, 1, 1), (2, 1, 2), (2, 1, 3), (2, 2, 1), (2, 2, 2), (2, 2, 3)\}$

	1,1), (2,1,2), (2,1,3), (2,2,1), (2,2,2), (2,2,3))
4 3 2	{1,2,3,4}x{1,2,3}x{1,2} = {(1,1,1), (1,1,2), (1,2,1), (1,2,2), (1,3,1), (1,3,2), (2,1,1), (2,1,2), (2,2,1), (2,2,2), (2,3,1), (2,3,2), (3,1,1), (3,1,2), (3,2,1), (3,2,2), (3,3,1), (3,3,2), (4,1,1), (4,1,2), (4,2,1), (4,2,2), (4,3,1), (4,3,2))}

96. Binary Relation

You are given two positive integer n_1 , and n_2 . Now assume sets $A=\{1, 2, \dots, n_1\}$ and $B=\{1, 2, \dots, n_2\}$. Print relation $R \subseteq A \times B$ such that for $x \in A$ and $y \in B$ $x < y$.

Input:

Inputs are positive integer n_1 , and n_2 .

Output:

$R = \{(1,2), (1,3), \dots, (1,n_2), (2,3), \dots, (2,n_2), \dots, (n_1,n_1+1), \dots, (n_1,n_2)\}$.

Sample Input	Sample Output
2 4	$R = \{(1,2), (1,3), (1,4), (2,3), (2,4)\}$
4 3	$R = \{(1,2), (1,3), (2,3)\}$
3 5	$R = \{(1,2), (1,3), (1,4), (1,5), (2,3), (2,4), (2,5), (3,4), (3,5)\}$

97. Trace

You are given a square matrix, find trace of the matrix.

The trace is sum of the diagonal elements of a square matrix. Assume following matrix A :

$$\begin{matrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{matrix}$$

Then trace of A is $A_{11} + A_{22} + A_{33}$.

Input:

Inputs are dimension of matrix followed by the matrix.

Output:

Output is the value of trace.

Sample Input	Sample Output
3	15

1 2 3	
4 5 6	
7 8 9	
2	0
1 1	
1 -1	
4	8
2 2 2 2	
2 2 2 2	
2 2 2 2	
2 2 2 2	

98. Pyramid

You are given positive integer n. Print a pyramid of n rows where each row is made of asterisk.

Input:

Input is a positive integer n.

Output:

Pyramid of n rows.

Sample Input	Sample Output
1	*
3	* *** *****
6	* *** ***** ***** ***** *****

99. Upside down Pyramid

You are given positive integer n. Print an upside down pyramid of n rows where each row is made of asterisk.

Input:

Input is a positive integer n.

Output:

Upside down pyramid of n rows.

Sample Input	Sample Output
--------------	---------------

101. Right Arrow

You are given positive integer n . Print a right arrow of $2*n-1$ rows where each row is made of asterisk.

Input:

Input is a positive integer n .

Output:

A right arrow of $2*n-1$ rows of asterisk.

Sample Input	Sample Output
5	<pre>* *** ***** ***** ***** ***** ***** *** *</pre>
8	<pre>* *** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *** ** *</pre>

102. Left Arrow

You are given positive integer n . Print a left arrow of $2*n-1$ rows where each row is made of asterisk.

Input:

Input is a positive integer n .

Output:

A left arrow of $2*n-1$ rows of asterisk.

Sample Input	Sample Output
--------------	---------------

5	<pre> * *** ***** * ***** * ***** * </pre>
8	<pre> * *** ***** * ***** * ***** * ***** * ***** * ***** * ***** * ***** * </pre>

103. Numbers' Pyramid

You are given positive integer n. Print a pyramid of n rows where each row is made of numbers as shown in samples.

Input:

Input is a positive integer n.

Output:

A numbers' pyramid of n rows.

Sample Input	Sample Output
5	<pre> 1 1 2 1 1 2 3 2 1 1 2 3 4 3 2 1 1 2 3 4 5 4 3 2 1 </pre>
8	<pre> 1 1 2 1 1 2 3 2 1 1 2 3 4 3 2 1 1 2 3 4 5 4 3 2 1 1 2 3 4 5 6 5 4 3 2 1 1 2 3 4 5 6 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8 7 6 5 4 3 2 1 </pre>

104. Hollow Pyramid

You are given positive integer n . Print a pyramid of n rows where each row is made of numbers as shown in samples.

Input:

Input is a positive integer n .

Output:

A numbers' pyramid of n rows.

Sample Input	Sample Output
5	<pre> 1 1 1 1 1 1 1 1 2 3 4 5 4 3 2 1</pre>
8	<pre> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 7 6 5 4 3 2 1</pre>

105. Butterfly

You are given positive integer n . Print a butterfly of $2n$ rows where each row is made of asterisk as shown in samples.

Input:

Input is a positive integer n .

Output:

A butterfly of n rows.

Sample Input	Sample Output
5	<pre>* * * * * * * * ** ** * * * * * * * *</pre>

8

```
*      *
*      *
*      *
*      *
*      *
*      *
*      *
**
**
*      *
*      *
*      *
*      *
*      *
*      *
*      *
```

106. Pascal's Triangle

You are given positive integer n. Print n rows of Pascal's triangle.

Input:

Input is a positive integer n.

Output:

n rows of Pascal's triangle.

Sample Input	Sample Output
5	1 1 1 1 2 1 1 3 3 1 1 4 6 4 1
8	1 1 1 1 2 1 1 3 3 1 1 4 6 4 1 1 5 10 10 5 1 1 6 15 20 15 6 1 1 7 21 35 35 21 7 1

107. “Z”

You are given positive integer n . Print a shape similar to letter “Z” of n rows of asterisk.

Input:

Input is a positive integer n .

Output:

n rows of asterisk to shape letter “Z”.

Sample Input	Sample Output
5	***** * * * * * *****
8	***** * * * * * * * * * *****

108. “Y”

You are given positive integer n . Print a shape similar to letter “Y” of $2n$ rows of asterisk.

Input:

Input is a positive integer n .

Output:

$2n$ rows of asterisk to shape letter “Y”.

Sample Input	Sample Output
5	* * * * * * * * * * * * * *

