

Write a Python program to accomplish the following task:

1. To find sum of two numbers.
2. To find out simple interest using the following formula:
$$I = (P * R * N) / 100$$

where P = principal amount,
 R = Rate of interest and
 N = Number of year.
3. Write a program to do the following operations :
 - Read any two positive integer operands (say op1 & op2) and one character type operator (say opr). Note that opr is any mathematical operator.
 - Depending upon the operator, do the appropriate operation. e. g. if opr is '+' then the display the value obtained by evaluating the expression (op1 + op2).
4. An electronic component vendor supplies three products : transistors, resistors and capacitors. The vendor gives a discount of 10% on orders for transistors if the order is for more than Rs. 1000. On orders of more than Rs. 100 for resistors, a discount of 5% is given, and a discount of 10% is given on orders for capacitors of value more than Rs. 500. Assume that the numeric codes 1,2 and 3 are used for transistors, capacitors and resistors respectively. Write a program that reads the product code and the order amount and prints out the net amount that the customer is required to pay after discount.
5. To check whether the given number is odd or even.
6. To check whether the given number is positive or negative or zero.
7. To check whether the given number is of one digit or two digit or three digit or more digit.
8. To check whether the given number is divisible by 7 or not.
9. To find the maximum number out of given three positive numbers.
10. Write a program that reads three positive numbers a, b, c and determines whether they can form the three sides of a triangle. If yes, determine whether the triangle will be an obtuse-angle, or a right-angle or an acute-angle triangle. If the triangle is an acute angle triangle, determine further whether the triangle is equilateral, isosceles or scalene.
11. A function f is defined as follows:
$$\begin{aligned} f(x) &= ax^3 - bx^2 + cx - d, & \text{if } x > k \\ &= 0, & \text{if } x = k \\ &= -ax^3 + bx^2 - cx + d, & \text{if } x < k \end{aligned}$$

Write a program that reads a, b, c, d, k and x and prints the value of f(x).
12. Write a program that read three digit positive numbers and find the sum of all digits from the given number. For example, if the input number is 345, then the sum will be 12 (i. e. 3+4+5).
13. SUM = 1 + 2 + 3 + 4 + 5 + 6 + .. and so on.
14. SUM = 1 + 4 - 9 + 16 - 25 + 36 - ... and so on
15. SUM = 1² + 2² + 3² + 4² + 5² + 6² + 7² + ... and so on
16. SUM = x - x³/3! + x⁵/5! - x⁷/7! + x⁹/9! -... and so on
17. SUM = x + x² + x³ + x⁴ + x⁵ + x⁶... and so on
18. SUM = 1 + 2 + 4 + 8 + 16 + 32 + 64 + ... and so on

19. $SUM = 1 + 1/4 + 1/9 + 1/16 + 1/25 + \dots$ and so on
20. $SUM = 1 + 8 + 27 + 64 + \dots$ and so on
21. To print first 100 odd numbers. Note that program should display only five numbers per line.
22. To print multiplication table from 1x1 to 10x10.
23. To compute the sum of each digits from a given positive integer number.
24. To read any five real numbers and print the average value.
25. To calculate the sum of first N natural numbers.
26. To calculate the average of first N odd numbers.
27. To calculate the average of first N even numbers.
28. To calculate the sum of the square of first N numbers.
29. To find factorial of a given number. $N! = 1*2*3*....*N$.
30. To check whether a given number N1 is divisible by the number N2 or not.
31. To print first 100 alternative odd numbers.
32. To print all odd numbers between V1 and V2. Assume that both V1 and V2 are positive and $V1 < V2$.
33. To find sum of all digits from a given positive number.
34. To find sum of all add digits and even digits from a given positive number.
35. To find sum of all prime digits from a given number.

Write a program to generate and display the following patterns:

36.

```

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

38.

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

40.

```

$ $ $ $ $
$ $ $ $
$ $ $
$ $
$
```

42.

```

1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

37.

```

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

39.

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

41.

```

$ $ $ $ $
$ $ $ $
$ $ $
$ $
$
```

43.

```

5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```


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60. 5
 4 4
 3 3 3
 2 2 2 2
 1 1 1 1 1

62. 1
 2 2
 3 3 3
 4 4 4 4
 5 5 5 5 5

64. 1
 1 4
 1 4 9
 1 4 9 16
 1 4 9 16 25

66. 1
 2 2
 3 3 3
 4 4 4 4

68. 1
 1 2 3
 1 2 3 4
 1 2 3 4

70. a
 a b c
 a b c d
 a b c d

72. a
 a b c
 a b c
 a b c

74. A A A A A
 B B B B
 C C C
 D D
 E

76. E
 D D
 C C C
 B B B B
 A A A A A

61. 5
 4 4
 3 3 3
 2 2 2 2
 1 1 1 1 1

63. 1
 2 2
 3 3 3
 4 4 4 4
 5 5 5 5 5

65. 1
 4 1
 9 4 1
 16 9 4 1
 25 16 9 4 1

67. 4
 3 3
 2 2 2
 1 1 1 1

69. 1
 2 1
 3 2 1
 4 3 2 1

71. *
 * *
 * * *
 * * * *
 * * * * *

73. *
 * *
 * * *
 * * *
 * * *

75. A A A A A
 B B B B
 C C C
 D D
 E

77. E
 D D
 C C C
 B B B B
 A A A A A

93. A diamond pattern is formed with a given letter of the alphabet. Write a program to generate and display such by accepting any character and total number of lines (say N). Assume N is an odd number. For example, if the accepted character is 'X' and N = 7, then your program should display the following output :

```

      X
     X X
    X  X  X
   X   X  X  X
  X    X  X  X
   X   X  X
    X  X
     X
      X
  
```

94. To print ASCII value of all characters.
 95. To print the series : 2, 10, 30, 68, 130,
 96. To print the series : 1, 3, 6, 10, 15, 21,
 97. To print the series : 1, -2, 3, -4, 5, -6, 7,
 98. A pattern is constructed by stacking up 3 basic triangles formed with stars. The figure below shows each basic triangle having 3 layers of stars:

```

      *
     * * *
    * * * * *
   * * * * *
  * * * * *
 * * * * *

```

99. Generate the following “pyramid” of digits.

```

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

100. Write a program to generate and display Floyd’s triangle as shown below:

```

 1
 2 3
 4 5 6
 7 8 9 10
11 12 13 14 15
  
```

101. Write a program to generate and display the following pattern:

```

      1
     0 1
    1 0 1
   0 1 0 1
  1 0 1 0 1
 0 1 0 1 0 1
  
```

102. Write a program to generate and display the following pattern:
- ```
1 *
1 * 2 * *
1 * 2 * * 3 * * *
1 * 2 * * 3 * * * 4 * * * *
1 * 2 * * 3 * * * 4 * * * * 5 * * * * *
```
103. To print the power of 2 table for the power 0 to 20.
104. To print "Powers of 2" table for the power 0 to 20.
105. To find the reverse number of a given positive number.
106. To evaluate the following sum:  
$$\text{sum} = \sum (-1)^n ((x^{n/2})/n)(n+1) \quad \text{for } n = 1 \text{ to } 10$$
107. To find the value of the following formula:  
$$nC_r = n!/(r! * (n-r)!)$$
108. To find the value of the following formula:  
$$nPr = n!/(n-r)!$$
109. Write a program to do the following tasks:  
[a] Read any two positive numbers say n1 & n2. Assume n1>n2.  
[b] Print all even numbers that lies between n1 & n2.  
[c] Print the total number of an even numbers between n1 and n2.
110. Write a program to evaluate the function  
$$y = x^n$$
  
where n is a non-negative integer.
111. To find out the total number of an odd digits within the given number and print the sum of all odd digits.
112. To find out the total number of an even digits within the given number and print the sum of all even digits.
113. To convert the given decimal number into its equivalent binary number.
114. To convert the given octal number into its equivalent decimal number.
115. To convert the given binary number into its equivalent decimal number.
116. To check whether the given number is an octal number or not.
117. To check whether the given number is a binary number or not.
118. To calculate the sum of every third integer, beginning with i=2 (i.e. calculate the sum 2+5+8+11+...) for all values of i that are less than 100.
119. Write a program to do the following operations:  
[a] Read a keystroke until a return key is pressed.  
[b] Print the total number of vowels entered.  
[c] Print the total number of blank spaces entered.  
[d] Print the total numbers of digits entered.
120. You are given two 4-digit positive integers. Write a program to calculate and print out the sum of the products of each pair of digits occupying the same position in the two numbers. For example, if first number is 3445 and second number is 4534, then output will be 64 (3\*4+4\*5+4\*3+5\*4=64).