Part 02
Loop Statements

-------------------------- **BASIC** --------------------------

1. Write a program that displays the first **N** positive integers.
Example 1:   How many number that you want to display? -8
               Accept positive number only!
Example 2:   How many number that you want to display? 10
               The first 10 positive integer are:
               1, 2, 3, 4, 5, 6, 7, 8, 9, 10

2. Write a program that **displays all** 2-digit positive integers.
Example: All 2-digit positive integers are:
             10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,
             30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49,
             50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69,
             70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89,
             90, 91, 92, 93, 94, 95, 96, 97, 98, 99

3. Write a program that **displays all** 3-digit negative integers.
Example: All 3-digit negative integers are:
             -999,-998,-997,-996,-995,-994,-993,-992,-991,-990,-989,-988,-987,-986,-985,-984,-983,-982,-981,-980,
             -979,-978,-977,-976,-975,-974,-973,-972,-971,-970,-969,-968,-967,-966,-965,-964,-963,-962,-961,-960,
             -959,-958,-957,-956,-955,-954,-953,-952,-951,-950,-949,-948,-947,-946,-945,-944,-943,-942,-941,-940,
             -939,-938,-937,-936,-935,-934,-933,-932,-931,-930,-929,-928,-927,-926,-925,-924,-923,-922,-921,-920,
             -919,-918,-917,-916,-915,-914,-913,-912,-911,-910,-909,-908,-907,-906,-905,-904,-903,-902,-901,-900,
             -899,-898,-897,-896,-895,-894,-893,-892,-891,-890,-889,-888,-887,-886,-885,-884,-883,-882,-881,-880,
             -879,-878,-877,-876,-875,-874,-873,-872,-871,-870,-869,-868,-867,-866,-865,-864,-863,-862,-861,-860,
             -859,-858,-857,-856,-855,-854,-853,-852,-851,-850,-849,-848,-847,-846,-845,-844,-843,-842,-841,-840,
             -839,-838,-837,-836,-835,-834,-833,-832,-831,-830,-829,-828,-827,-826,-825,-824,-823,-822,-821,-820,
             -819,-818,-817,-816,-815,-814,-813,-812,-811,-810,-809,-808,-807,-806,-805,-804,-803,-802,-801,-800,
             -799,-798,-797,-796,-795,-794,-793,-792,-791,-790,-789,-788,-787,-786,-785,-784,-783,-782,-781,-780,
             -779,-778,-777,-776,-775,-774,-773,-772,-771,-770,-769,-768,-767,-766,-765,-764,-763,-762,-761,-760,
             -759,-758,-757,-756,-755,-754,-753,-752,-751,-750,-749,-748,-747,-746,-745,-744,-743,-742,-741,-740,
             -739,-738,-737,-736,-735,-734,-733,-732,-731,-730,-729,-728,-727,-726,-725,-724,-723,-722,-721,-720,
             -719,-718,-717,-716,-715,-714,-713,-712,-711,-710,-709,-708,-707,-706,-705,-704,-703,-702,-701,-700,
             -699,-698,-697,-696,-695,-694,-693,-692,-691,-690,-689,-688,-687,-686,-685,-684,-683,-682,-681,-680,
             -679,-678,-677,-676,-675,-674,-673,-672,-671,-670,-669,-668,-667,-666,-665,-664,-663,-662,-661,-660,
             -659,-658,-657,-656,-655,-654,-653,-652,-651,-650,-649,-648,-647,-646,-645,-644,-643,-642,-641,-640,
             -639,-638,-637,-636,-635,-634,-633,-632,-631,-630,-629,-628,-627,-626,-625,-624,-623,-622,-621,-620,
             -619,-618,-617,-616,-615,-614,-613,-612,-611,-610,-609,-608,-607,-606,-605,-604,-603,-602,-601,-600,
             -599,-598,-597,-596,-595,-594,-593,-592,-591,-590,-589,-588,-587,-586,-585,-584,-583,-582,-581,-580,
             -579,-578,-577,-576,-575,-574,-573,-572,-571,-570,-569,-568,-567,-566,-565,-564,-563,-562,-561,-560,
             -559,-558,-557,-556,-555,-554,-553,-552,-551,-550,-549,-548,-547,-546,-545,-544,-543,-542,-541,-540,
             -539,-538,-537,-536,-535,-534,-533,-532,-531,-530,-529,-528,-527,-526,-525,-524,-523,-522,-521,-520,
             -519,-518,-517,-516,-515,-514,-513,-512,-511,-510,-509,-508,-507,-506,-505,-504,-503,-502,-501,-500,
             -499,-498,-497,-496,-495,-494,-493,-492,-491,-490,-489,-488,-487,-486,-485,-484,-483,-482,-481,-480,
             -479,-478,-477,-476,-475,-474,-473,-472,-471,-470,-469,-468,-467,-466,-465,-464,-463,-462,-461,-460,
             -459,-458,-457,-456,-455,-454,-453,-452,-451,-450,-449,-448,-447,-446,-445,-444,-443,-442,-441,-440,
             -439,-438,-437,-436,-435,-434,-433,-432,-431,-430,-429,-428,-427,-426,-425,-424,-423,-422,-421,-420,
             -419,-418,-417,-416,-415,-414,-413,-412,-411,-410,-409,-408,-407,-406,-405,-404,-403,-402,-401,-400,
             -399,-398,-397,-396,-395,-394,-393,-392,-391,-390,-389,-388,-387,-386,-385,-384,-383,-382,-381,-380,
             -379,-378,-377,-376,-375,-374,-373,-372,-371,-370,-369,-368,-367,-366,-365,-364,-363,-362,-361,-360,
             -359,-358,-357,-356,-355,-354,-353,-352,-351,-350,-349,-348,-347,-346,-345,-344,-343,-342,-341,-340,
             -339,-338,-337,-336,-335,-334,-333,-332,-331,-330,-329,-328,-327,-326,-325,-324,-323,-322,-321,-320,
             -319,-318,-317,-316,-315,-314,-313,-312,-311,-310,-309,-308,-307,-306,-305,-304,-303,-302,-301,-300,
             -299,-298,-297,-296,-295,-294,-293,-292,-291,-290,-289,-288,-287,-286,-285,-284,-283,-282,-281,-280,
             -279,-278,-277,-276,-275,-274,-273,-272,-271,-270,-269,-268,-267,-266,-265,-264,-263,-262,-261,-260,
             -259,-258,-257,-256,-255,-254,-253,-252,-251,-250,-249,-248,-247,-246,-245,-244,-243,-242,-241,-240,
             -239,-238,-237,-236,-235,-234,-233,-232,-231,-230,-229,-228,-227,-226,-225,-224,-223,-222,-221,-220,
             -219,-218,-217,-216,-215,-214,-213,-212,-211,-210,-209,-208,-207,-206,-205,-204,-203,-202,-201,-200,
             -199,-198,-197,-196,-195,-194,-193,-192,-191,-190,-189,-188,-187,-186,-185,-184,-183,-182,-181,-180,
             -179,-178,-177,-176,-175,-174,-173,-172,-171,-170,-169,-168,-167,-166,-165,-164,-163,-162,-161,-160,
             -159,-158,-157,-156,-155,-154,-153,-152,-151,-150,-149,-148,-147,-146,-145,-144,-143,-142,-141,-140,
             -139,-138,-137,-136,-135,-134,-133,-132,-131,-130,-129,-128,-127,-126,-125,-124,-123,-122,-121,-120,
             -119,-118,-117,-116,-115,-114,-113,-112,-111,-110,-109,-108,-107,-106,-105,-104,-103,-102,-101,-100

4. Write a program that displays the first *N* positive even numbers.

Example 1:   How many positive even number that you want to display? 0
                Accept positive number only!

Example 2:   How many positive even number that you want to display? 10
                The first 10 positive even numbers are:
                2, 4, 6, 8, 10, 12, 14, 16, 18, 20

5. Write a program that displays the first *N* positive odd numbers.

Example 1:   How many positive odd number that you want to display? 0
                Accept positive number only!

Example 2:   How many positive odd number that you want to display? 10
                The first 10 positive odd numbers are:
                1, 3, 5, 7, 9, 11, 13, 15, 17, 19

Theory: *An Armstrong number is 3-digit integer that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since $3^3 + 7^3 + 1^3 = 371$.*

6. **(*)** Write a program that **displays all** Amstrong numbers.

Example: All Amstrong numbers are: 153, 370, 371, 407

-------------------------- ACCUMULATE SUM --------------------------

7. Write a program that calculates the sum $S = 1 + 2 + 3 + ... + N$ and presents the result as the example below.

Example 1:   Please enter positive integer N: 0
                Accept positive number only!

Example 2:   Please enter positive integer N: 1
                The sum is S = 1

Example 3:   Please enter positive integer N: 9
                The sum is S = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45

8. Write a program that calculates the sum $S = 1 - 2 + 3 - 4 + ... + (-1^{N+1} * N)$ and presents the result as the example below.

Example 1:   Please enter positive integer N: -7
                Accept positive number only!

Example 2:   Please enter positive integer N: 1
                The sum is S = 1

Example 4:   Please enter positive integer N: 11
                The sum is S = 1 - 2 + 3 - 4 + 5 - 6 + 7 – 8 + 9 – 10 + 11 = 6

9. Write a program that calculates the sum $S = 1 + \frac{1}{2} + \frac{1}{3} + ... + \frac{1}{N}$ and presents the result as the example below.

Example 1:   Please enter positive integer N: 0
                Accept positive number only!

Example 2:   Please enter positive integer N: 1
                The sum is S = 1

Example 3:   Please enter positive integer N: 6
                The sum is S = 1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 = 2.450000

10. Write a program that calculates the sum $S = -1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} + ... + \frac{-1^N}{N}$ and presents the result as the example below.

Example 1: `Please enter positive integer N: 0`
`Accept positive number only!`

Example 2: `Please enter positive integer N: 1`
`The sum is S = -1`

Example 3: `Please enter positive integer N: 7`
`The sum is S = -1 + 1/2 - 1/3 + 1/4 - 1/5 + 1/6 – 1/7 = -0.759524`

------------------------------ ACCUMULATE MULTIPLY ------------------------------

11. Write a program that calculates the factorial $N! = 1 * 2 * 3 * ... * N$ and presents the result as the example below.

Example 1: `Please enter positive integer N: -7`
`N must be greater than or equal 0!`

Example 2: `Please enter positive integer N: 0`
`Result: 0! = 1`

Example 3: `Please enter positive integer N: 9`
`Result: 9! = 1*2*3*4*5*6*7*8*9 = 362880`

Example 4: `Please enter positive integer N: 20`
`Result: 20! = 1*2*3*4*5*6*7*8*9*10*11*12*13*14*15*16*17*18*19*20`
`           = 2432902008176640000`

12. Write a program that calculates the result of X powers N and presents the result as the example below.

Example 1: `Please enter the base    X: 4`
`Please enter the exponent N: -3`
`The exponent N must be greater than or equal 0!`

Example 2: `Please enter the base    X: 0`
`Please enter the exponent N: 5`
`Result: 0^5 = 0`

Example 3: `Please enter the base    X: 7`
`Please enter the exponent N: 0`
`Result: 7^0 = 1`

Example 4: `Please enter the base    X: 5`
`Please enter the exponent N: 4`
`Result: 5^4 = 625`

Example 5: `Please enter the base    X: 10`
`Please enter the exponent N: 18`
`Result: 10^18 = 1000000000000000000`

13. (*) Write a program that calculates the result of X powers N and presents the result as Ex12. **Requirement:** N can be a negative number. *Example:* `Result: 4^-2 = 0.062500`

-------------------------- NUMERALS --------------------------

14. Write a program that displays the all divisors of a positive integer **N**.
Example 1:   Please enter positive integer N: -3
                Accept positive number only!
Example 2:   Please enter positive integer N: 10
                All divisors of 10 are:
                1, 2, 5, 10

15. Write a program that calculates the sum of all divisors of a positive integer **N**.
Example 1:   Please enter positive integer N: 0
                Accept positive number only!
Example 2:   Please enter positive integer N: 10
                The sum of all divisors of 10 is
                S = 1 + 2 + 5 + 10 = 18

16. Write a program that counts the number of divisors of a positive integer **N**.
Example 1:   Please enter positive integer N: -6
                Accept positive number only!
Example 2:   Please enter positive integer N: 10
                The number of divisors of 10 is 4

Theory:

*All divisors of a positive integer **N** that smaller than **N** is called real divisors.*

The perfect number is the positive integer whose sum of all it's real divisors equals itself.

  For example, 6 is a perfect number.

  Explanation:

    * All divisors of 6 are: 1, 2, 3, 6

    * All real divisors of 6 are: 1, 2, 3

    * 6 is a perfect number since 1 + 2 + 3 = 6

17. Write a program that allows user to enter a positive integer called **N** and then check if the entered number is a perfect number or not.
Example 1:   Please enter positive integer N: 0
                Accept positive number only!
Example 2:   Please enter positive integer N: 28
                28 is a perfect number
Example 3:   Please enter positive integer N: 12
                12 is not a perfect number

18. Write a program that displays all perfect number that smaller than 1000.
Example: All perfect number that smaller than 1000 are:
                6, 28, 496

Theory:
A number is called a <mark>**prime number**</mark> if it has only <mark>2 divisors</mark>.
A number is called a **prime number** if it is only <mark>divisible by 1 and itself</mark>.
  For example, All divisors of 11 are 1 and 11,   so 11 is a prime number.
                    All divisors of 15 are 1, 3, 5 and 15,   so 9 is not a prime number.

19. Write a program that allows user to enter a positive integer called **N** and then check if the entered number is a prime number or not.

Example 1:
```
Please enter positive integer N: -19
Accept positive number only!
```
Example 2:
```
Please enter positive integer N: 22
22 is not a prime number
```
Example 3:
```
Please enter positive integer N: 19
19 is not a prime number
```

20. Write a program that displays all prime number that from **A** to **B**.

Example 1:
```
Please enter the lower bound A: -40
Please enter the upper bound B: 19
The lower bound must be a positive integer!
```
Example 2:
```
Please enter the lower bound A: 152
Please enter the upper bound B: 98
The lower bound must be smaller than or equal the upper bound!
```
Example 3:
```
Please enter the lower bound A: 10
Please enter the upper bound B: 20
All prime numbers from 10 to 20 are:
11, 13, 17, 19
```

----------------------------- ALGEBRA -----------------------------

Theory:
The **greatest common divisor (GCD)** of two integers, which are not all zero, is the largest positive integer that divides each of the integers. For example, the GCD(20, 15) is 5.
The **least common multiple (LCM)**, lowest common multiple, or smallest common multiple of two integers, is the smallest positive integer that is divisible by both of them.
  For example, the LCM(20, 15) is 60.

Calculates GCD subtraction algorithm (both a and b must be different from 0)

      While $a \neq b$

$$GCD(a, b) = \begin{cases} GCD(a - b, b) & a > b \\ GCD(a, b - a) & a < b \end{cases}$$

Calculates GCD division algorithm (b must be different from 0)

      While $a \bmod b \neq 0$

$$GCD(a, b) = \begin{cases} GCD(b, a \bmod b) & a \bmod b \neq 0 \\ b & a \bmod b = 0 \end{cases}$$

Calculates LCM

$$LCM(a, b) = \frac{a*b}{GCD(a,b)}$$

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21. Write a program that allows the user to enter 2 positive integers called *A* and *B*. This program will using <mark>subtraction algorithm</mark> to find the GCD and the LCM of 2 numbers *A* and *B*.

Example 1:   `Please enter the positive integer A: -32`
                `Please enter the positive integer B: 5`
                `A and B must be greater than or equal 0!`

Example 2:   `Please enter the positive integer A: 9`
                `Please enter the positive integer B: 0`
                `The greatest common divisor  of 9 and 0 is 9`
                `The least    common multiple of 9 and 0 is 0`

Example 3:   `Please enter the positive integer A: 0`
                `Please enter the positive integer B: 18`
                `The greatest common divisor  of 0 and 18 is 18`
                `The least    common multiple of 0 and 18 is 0`

Example 4:   `Please enter the positive integer A: 25`
                `Please enter the positive integer B: 20`
                `The greatest common divisor  of 25 and 20 is`
                  <mark>`(25,20)=(5,20)=(5,15)=(5,10)=(5,5)=5`</mark>
                `The least    common multiple of 25 and 20 is 100`

Example 5:   `Please enter the positive integer A: 8`
                `Please enter the positive integer B: 10`
                `The greatest common divisor  of 8 and 10 is`
                  <mark>`(8,10)=(8,2)=(6,2)=(4,2)=(2,2)=2`</mark>
                `The least    common multiple of 8 and 10 is 40`

22. Write a program that allows the user to enter 2 positive integers called *A* and *B*. This program will using <mark>division algorithm</mark> to find the GCD and the LCM of 2 numbers *A* and *B*.

Example 1:   `Please enter the positive integer A: -32`
                `Please enter the positive integer B: 5`
                `A and B must be greater than or equal 0!`

Example 2:   `Please enter the positive integer A: 9`
                `Please enter the positive integer B: 0`
                `The greatest common divisor  of 9 and 0 is 9`
                `The least    common multiple of 9 and 0 is 0`

Example 3:   `Please enter the positive integer A: 25`
                `Please enter the positive integer B: 20`
                `The greatest common divisor  of 25 and 20 is`
                  <mark>`(25,20)=(20,5)=5`</mark>
                `The least    common multiple of 25 and 20 is 100`

Example 4:   `Please enter the positive integer A: 8`
                `Please enter the positive integer B: 10`
                `The greatest common divisor  of 8 and 10 is`
                  <mark>`(8,10)=(10,8)=(8,2)=2`</mark>
                `The least    common multiple of 8 and 10 is 40`

23. Write a program that allows the user to enter a positive integer called *N* that smaller than $18*10^{18}$. This program will calculate the sum of all digits of *N*.

Example 1:   `Please enter the positive integer N: -11`
                `N must greater than or equal 0!`

Example 2:   `Please enter the positive integer N: 65453278`
                `The sum of all digits of 65453278 is`
                `S = 8 + 7 + 2 + 3 + 5 + 4 + 5 + 6 = 40`

24. Write a program that allows the user to enter a positive integer called **N** *(N ≤ 18*10¹⁸)*. This program will calculate and display the reverse value of **N**.

Example 1:   `Please enter the positive integer N: -7`
               `N must greater than or equal 0!`

Example 2:   `Please enter the positive integer N: 9853247`
               `The reverse number of 9853247 is 7423589`

Example 3:   `Please enter the positive integer N: 4560000`
               `The reverse number of 4560000 is 654`

25. Write a program to display all 2-digit numbers that the sum of digits of that number equal to number **N**.

Example 1:   `Please enter the positive integer N: 6`
               `All 2-digit numbers that the sum of digits of that number equal to 6 are:`
               `15, 24, 33, 42, 51, 60`

Example 2:   `Please enter the positive integer N: 0`
               `Don't have any 2-digit number that the sum of digits of that number equal to 0`

Example 3:   `Please enter the positive integer N: 19`
               `Don't have any 2-digit number that the sum of digits of that number equal to 19`

-------------------------- DO...WHILE LOOP ----------------------------

26. Write a program that displays the multiplication table of **N**.

Example 1:   `Please enter the positive integer N: -7`
               `N must be greater than 0!`

Example 2:   `Please enter the positive integer N: 5`
               `The multiplication table of 5 is:`

```
        1    x    5    =        5
        2    x    5    =        10
        3    x    5    =        15
        4    x    5    =        20
        5    x    5    =        25
        6    x    5    =        30
        7    x    5    =        35
        8    x    5    =        40
        9    x    5    =        45
       10    x    5    =        50
```

27. Write a program that displays the 8 multiplication tables from 2 to 9.

28. Write a program that allows the user to enter a positive integer **N** and then display the multiplication table of **N**. The program will show a message asking if the user wants to continue or not. If user said yes, the program will be continued, otherwise the program will be stopped.

Example:
```
Please enter the positive integer N: -7
N must be greater than 0!
Please enter the positive integer N: 5
The multiplication table of 5 is:
        1       x       5       =       5
        2       x       5       =       10
        3       x       5       =       15
        4       x       5       =       20
        5       x       5       =       25
        6       x       5       =       30
        7       x       5       =       35
        8       x       5       =       40
        9       x       5       =       45
       10       x       5       =       50
Do you want to continue (y/n)? a
You must enter 'y' or 'Y' or 'n' or 'N'!
Do you want to continue (y/n)? y
Please enter the positive integer N: 9
The multiplication table of 9 is:
        1       x       9       =       9
        2       x       9       =       18
        3       x       9       =       27
        4       x       9       =       36
        5       x       9       =       45
        6       x       9       =       54
        7       x       9       =       63
        8       x       9       =       72
        9       x       9       =       81
       10       x       9       =       90
Do you want to continue (y/n)? n
Thank for using our software!
Goodbye and see you again.
```

-------------------------- NESTED LOOPS --------------------------

29. Write a program that displays the number-triangle with **N** lines and is formatted as below.

Example 1:
```
Please enter the positive integer N: 0
N must be greater than 0!
```

Example 2:
```
Please enter the positive integer N: 5
The number-triangle that has 5 lines is:
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

30. Write a program that displays the number-triangle with **N** lines and is formatted as below.

Example 1:   `Please enter the positive integer N: 0`
               `N must be greater than 0!`

Example 2:   `Please enter the positive integer N: 5`
               `The number-triangle that has 5 lines is:`
               `1`
               `1 2`
               `1 2 3`
               `1 2 3 4`
               `1 2 3 4 5`

31. Write a program that displays the number-triangle with **N** lines and is formatted as below.

Example 1:   `Please enter the positive integer N: 0`
               `N must be greater than 0!`

Example 2:   `Please enter the positive integer N: 4`
               `The number-triangle that has 4 lines is:`
               `1`
               `2 1`
               `3 2 1`
               `4 3 2 1`

32. Write a program that displays the star-triangle with **N** lines and is formatted as below.

Example 1:   `Please enter the positive integer N: -8`
               `N must be greater than 0!`

Example 2:   `Please enter the positive integer N: 4`
               `The star-triangle that has 4 lines is:`
               `*`
               `* *`
               `* * *`
               `* * * *`

33. Write a program that displays the star-triangle with **N** lines and is formatted as below.

Example: `Please enter the positive integer N: 4`
               `The star-triangle that has 4 lines is:`
               `* * * *`
               `* * *`
               `* *`
               `*`

34. Write a program that displays the star-triangle with **N** lines and is formatted as below.

Example: `Please enter the positive integer N: 4`
               `The star-triangle that has 4 lines is:`
               `      *`
               `    * *`
               `  * * *`
               `* * * *`

35. Write a program that displays the star-triangle with **N** lines and is formatted as below.

Example: `Please enter the positive integer N: 4`
               `The star-triangle that has 4 lines is:`
               `* * * *`
               `  * * *`
               `    * *`
               `      *`

36. Write a program that displays the star-triangle with *N* lines and is formatted as below.

Example:
```
Please enter the positive integer N: 4
The star-triangle that has 4 lines is:
      *
    * * *
  * * * * *
* * * * * * *
```

37. Write a program that displays the star-triangle with *N* lines and is formatted as below.

Example:
```
Please enter the positive integer N: 4
The star-triangle that has 4 lines is:
* * * * * * *
  * * * * *
    * * *
      *
```

38. Write a program that displays the star-rhombus with *2N-1* lines and is formatted as below.

Example:
```
Please enter the positive integer N: 4
The star-rhombus that has 7 lines is:
      *
    * * *
  * * * * *
* * * * * * *
  * * * * *
    * * *
      *
```

39. Write a program that allows the user to enter 2 positive integers *W* and *H*, then display the rectangle in the format as below.

 a. *Example:*
```
Please enter the width  W: 6
Please enter the height H: 4
The rectangle which size is 6x4:
* * * * * *
*         *
*         *
* * * * * *
```

 b. *Example:*
```
Please enter the width  W: 6
Please enter the height H: 4
The filled rectangle which size is 6x4:
* * * * * *
* * * * * *
* * * * * *
* * * * * *
```

40. Write a program that allows the user to enter 2 positive integers *W* and *H*, then display the parallelogram in the format as below.

 a. *Example:*
```
Please enter the width  W: 6
Please enter the height H: 5
The parallelogram which size is 6x5:
        * * * * * *
       *         *
      *         *
     *         *
* * * * * *
```

b. *Example:*
```
Please enter the width  W: 6
Please enter the height H: 5
The filled parallelogram which size is 6x5:
        * * * * * *
       * * * * * *
      * * * * * *
     * * * * * *
    * * * * * *
```

41. Write a program that allows the user to enter a positive integer **N**, then display the square in the format as below.

Example 1:
```
Please enter a positive integer N: -5
N must be greater than 0!
Please enter a positive integer N: 0
N must be greater than 0!
Please enter a positive integer N: 4
The square which size is 4:
      *
    *   *
  *       *
*           *
  *       *
    *   *
      *
```

Example 2:
```
Please enter a positive integer N: 2
The square which size is 2:
  *
*   *
  *
```

Example 3:
```
Please enter a positive integer N: 1
The square which size is 1:
*
```

Example 4:
```
Please enter a positive integer N: 8
The square which size is 8:
              *
            *   *
          *       *
        *           *
      *               *
    *                   *
  *                       *
*                           *
  *                       *
    *                   *
      *               *
        *           *
          *       *
            *   *
              *
```