

**### Question 1**

Level 1

Question:

Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included).

The numbers obtained should be printed in a comma-separated sequence on a single line.

Hints:

Consider use range(begin, end) method

```
In [19]: l=[]
for i in range(2000,3200):
    if(i%7==0) and (i%5!=0):
        l.append(str(i))
print(','.join(str(i) for i in l))
```

2002,2009,2016,2023,2037,2044,2051,2058,2072,2079,2086,2093,2107,2114,2121,2128,2142,2149,2156,2163,2177,2184,2191,2198,2212,2219,2226,2233,2247,2254,2261,2268,2282,2289,2296,2303,2317,2324,2331,2338,2352,2359,2366,2373,2387,2394,2401,2408,2422,2429,2436,2443,2457,2464,2471,2478,2492,2499,2506,2513,2527,2534,2541,2548,2562,2569,2576,2583,2597,2604,2611,2618,2632,2639,2646,2653,2667,2674,2681,2688,2702,2709,2716,2723,2737,2744,2751,2758,2772,2779,2786,2793,2807,2814,2821,2828,2842,2849,2856,2863,2877,2884,2891,2898,2912,2919,2926,2933,2947,2954,2961,2968,2982,2989,2996,3003,3017,3024,3031,3038,3052,3059,3066,3073,3087,3094,3101,3108,3122,3129,3136,3143,3157,3164,3171,3178,3192,3199

**### Question 2**

Level 1

Question:

Write a program which can compute the factorial of a given numbers.

The results should be printed in a comma-separated sequence on a single line.

Suppose the following input is supplied to the program:

8

Then, the output should be:

40320

In [24]: *#Hints:In case of input data being supplied to the question, it sho*  
`import numpy  
n=int(input())  
factorial_num=numpy.prod([i for i in range(1,n+1)])  
print(factorial_num)`

8  
40320

### ### Question 3

Level 1

Question:

With a given integral number n, write a program to generate a dictionary that contains (i, i\*i) such that i is an integral number between 1 and n (both included). and then the program should print the dictionary.

Suppose the following input is supplied to the program:

8

Then, the output should be:

{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}

*#Hints:In case of input data being supplied to the question, it should be assumed to be a console input. Consider use dict()*

In [28]: `n=int(input())  
d=dict()  
for i in range(1,n+1):  
 d[i]=i*i  
print(d)`

8  
{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}

### ### Question 4

Level 1

Question:

Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.

Suppose the following input is supplied to the program:

34,67,55,33,12,98

Then, the output should be:

['34', '67', '55', '33', '12', '98']  
('34', '67', '55', '33', '12', '98')

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

tuple() method can convert list to tuple

```
In [31]: #Hints:
#In case of input data being supplied to the question, it should be
#tuple() method can convert list to tuple
number = input("Input a sequence of comma-separated numbers: ")
list = number.split(",")
tuple = tuple(list)
print('List : ',list)
print('Tuple : ',tuple)
```

Input a sequence of comma-separated numbers: 34,67,55,33,12,98  
 List : ['34', '67', '55', '33', '12', '98']  
 Tuple : ('34', '67', '55', '33', '12', '98')

### ### Question 5

Level 1

Question:

Define a class which has at least two methods:

getString: to get a string from console input

printString: to print the string in upper case.

Also please include simple test function to test the class methods.

Hints:

Use `__init__` method to construct some parameters

```
In [32]: class IOString():
def __init__(self):
    self.str1 = ""

def get_String(self):
    self.str1 = input()

def print_String(self):
    print(self.str1.upper())

str1 = IOString()
str1.get_String()
str1.print_String()
```

hi  
 HI

### ### Question 6

Level 2

Question:

Write a program that calculates and prints the value according to the given formula:

$Q = \text{Square root of } \sqrt{(2 * C * D) / H}$

Following are the fixed values of C and H:

C is 50. H is 30.

D is the variable whose values should be input to your program in a comma-separated sequence.

Example

Let us assume the following comma separated input sequence is given to the program:

100,150,180

The output of the program should be:

18,22,24

Hints:

If the output received is in decimal form, it should be rounded off to its nearest value (for example, if the output received is 26.0, it should be printed as 26)

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [38]: import math

numbers_D = input("Input Value:")
numbers = numbers_D.split(',')

result_list = []
for D in numbers:
    Q = round(math.sqrt(2 * 50 * int(D) / 30))
    result_list.append(Q)

print(result_list)
```

Input Value:100,150,180

[18, 22, 24]

**### Question 7**

Level 2

Question:

Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be  $i*j$ .

Note:  $i=0,1,.., X-1$ ;  $j=0,1,..,Y-1$ .

Example

Suppose the following inputs are given to the program:

3,5

Then, the output of the program should be:

[\[\[0, 0, 0, 0, 0\], \[0, 1, 2, 3, 4\], \[0, 2, 4, 6, 8\]\]](#)

Hints:

Note: In case of input data being supplied to the question, it should be assumed to be a console input in a comma-separated form.

```
In [40]: row_num = int(input("Input number of rows: "))
col_num = int(input("Input number of columns: "))
multi_list = [[0 for col in range(col_num)] for row in range(row_num)]

for row in range(row_num):
    for col in range(col_num):
        multi_list[row][col]= row*col

print(multi_list)
```

Input number of rows: 3

Input number of columns: 5

[\[\[0, 0, 0, 0, 0\], \[0, 1, 2, 3, 4\], \[0, 2, 4, 6, 8\]\]](#)

**### Question 8**

Level 2

Question:

Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

Suppose the following input is supplied to the program:

without,hello,bag,world

Then, the output should be:

bag,hello,without,world

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [44]: items=input("Input separated sequence of words:")
words = [word for word in items.split(",")]
print(",".join(sorted(set(words))))
```

Input separated sequence of words:Banana, Apple,Taro,Coconut  
Apple,Banana,Coconut,Taro

### ### Question 9

Level 2

Questionf<sup>9</sup>

Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized. Suppose the following input is supplied to the program:

Hello world

Practice makes perfect

Then, the output should be:

HELLO WORLD

PRACTICE MAKES PERFECT

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [47]: word=input("Input sequence of line:")
print(word.upper())
```

Input sequence of line:Hello world  
HELLO WORLD

### ### Question 10

Level 2

Question:

Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

Suppose the following input is supplied to the program:

hello world and practice makes perfect and hello world again

Then, the output should be:

again and hello makes perfect practice world

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

We use set container to remove duplicated data automatically and then use sorted() to sort the data.

```
word=input("Input a sequence of whitespace separated words:")
```

```
[ ' ', '!', '@', '#', '$', '%', '&', '*', '^', '_ ', '~', 'a', 'c', 'd', 'e', 'f', 'g', 'h', 'i',  
 'k', 'l', 'm', 'n', 'o', 'p', 'r', 's', 't', 'w' ]
```

## Level 2

In case of input data being supplied to the question, it should be assumed to be a console input.

0100,0011,1010,1001  
1010

**### Question 12**

Level 2

Question:

Write a program, which will find all such numbers between 1000 and 3000 (both included) such that each digit of the number is an even number.

The numbers obtained should be printed in a comma-separated sequence on a single line.

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [14]: ans = []

for num in range(1000, 3001):
    num_str = str(num)
    is_ok = True

    for char in num_str:
        if int(char) % 2:
            is_ok = False
            break
    if is_ok:
        ans.append(str(num))

print(",".join(ans))
```

```
2000,2002,2004,2006,2008,2020,2022,2024,2026,2028,2040,2042,2044,2
046,2048,2060,2062,2064,2066,2068,2080,2082,2084,2086,2088,2200,22
02,2204,2206,2208,2220,2222,2224,2226,2228,2240,2242,2244,2246,224
8,2260,2262,2264,2266,2268,2280,2282,2284,2286,2288,2400,2402,2404
,2406,2408,2420,2422,2424,2426,2428,2440,2442,2444,2446,2448,2460,
2462,2464,2466,2468,2480,2482,2484,2486,2488,2600,2602,2604,2606,2
608,2620,2622,2624,2626,2628,2640,2642,2644,2646,2648,2660,2662,26
64,2666,2668,2680,2682,2684,2686,2688,2800,2802,2804,2806,2808,282
0,2822,2824,2826,2828,2840,2842,2844,2846,2848,2860,2862,2864,2866
,2868,2880,2882,2884,2886,2888
```



### ### Question 13

Level 2

Question:

Write a program that accepts a sentence and calculate the number of letters and digits.

Suppose the following input is supplied to the program:

hello world! 123

Then, the output should be:

LETTERS 10

DIGITS 3

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

In [16]: *#Hints: In case of input data being supplied to the question, it sh*

```
sentence = input("Input a string: ")
d=l=0
for c in sentence:
    if c.isdigit():
        d=d+1
    elif c.isalpha():
        l=l+1
    else:
        pass
print("Letters", l)
print("Digits", d)
```

Input a string: hello world! 123

Letters 10

Digits 3

### ### Question 14

Level 2

Question:

Write a program that accepts a sentence and calculate the number of upper case letters and lower case letters.

Suppose the following input is supplied to the program:

Hello world!

Then, the output should be:

UPPER CASE 1

LOWER CASE 9

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [18]: sentence=input("Input sentence: ")
d=l=0
for c in sentence:
    if c.isupper():
        d=d+1
    elif c.islower():
        l=l+1
    else:
        pass
print("Upper Case",d)
print("Lower case",l)
```

Input sentence: Hello World!

Upper Case 2

Lower case 8

### ### Question 15

Level 2

Question:

Write a program that computes the value of  $a+aa+aaa+aaaa$  with a given digit as the value of  $a$ .

Suppose the following input is supplied to the program:

9

Then, the output should be:

11106

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [26]: a=int(input())
n1 = int( "%s" % a )
n2 = int( "%s%s" % (a,a) )
n3 = int( "%s%s%s" % (a,a,a) )
n4=int("%s%s%s%s" %(a,a,a,a))
print (n1+n2+n3+n4)
```

9  
11106

### ### Question 16

Level 2

Question:

Use a list comprehension to square each odd number in a list. The list is input by a sequence of comma-separated numbers.

Suppose the following input is supplied to the program:

1,2,3,4,5,6,7,8,9

Then, the output should be:

1,3,5,7,9

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [*]: lst =input("Input List:")
lst_list=list(lst)
for i in lst_list:
    if i % 2==0:
        pass
    else:
        print(i,end=" ")
```

```
In [24]: lst = [10, 21, 4, 45, 66, 93, 11]
for i in lst:
    if i % 2 == 0:
        pass
    else:
        print(i, end=" ")
```

21 45 93 11

### ### Question 17

Level 2

Question:

Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:

D 100

W 200

D means deposit while W means withdrawl.

Suppose the following input is supplied to the program:

D 300

D 300

W 200

D 100

Then, the output should be:

500

In [\*]:

```
#Hints: In case of input data being supplied to the question, it sh
total = 0
while True:
    d_w_trans = input()
    if d_w_trans == "":
        break
    else:
        d_w_trans = d_w_trans.split(" ")
        if d_w_trans[0] == "D":
            total = total + int(d_w_trans[1])
        elif d_w_trans[0] == "W":
            total = total - int(d_w_trans[1])

print(total)
```

### ### Question 18

Level 3

Question:

A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [!@#\$%&]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example

If the following passwords are given as input to the program:

ABd1234@1,a F1#,2w3E\*,2We3345

Then, the output of the program should be:

ABd1234@1

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [*]: import re
p= input("Input your password")
x = True
while x:
    if (len(p)<6 or len(p)>12):
        break
    elif not re.search("[a-z]",p):
        break
    elif not re.search("[0-9]",p):
        break
    elif not re.search("[A-Z]",p):
        break
    elif not re.search("[$#@]",p):
        break
    elif re.search("\s",p):
        break
    else:
        print("Valid Password")
        x=False
        break

if x:
    print("Not a Valid Password")
```

**### Question 19**

Level 3

Question:

You are required to write a program to sort the (name, age, height) tuples by ascending order where name is string, age and height are numbers. The tuples are input by console. The sort criteria is:

- 1: Sort based on name;
- 2: Then sort based on age;
- 3: Then sort by score.

The priority is that name > age > score.

If the following tuples are given as input to the program:

Tom,19,80

John,20,90

Jony,17,91

Jony,17,93

Json,21,85

Then, the output of the program should be:

`[('John', '20', '90'), ('Jony', '17', '91'), ('Jony', '17', '93'), ('Json', '21', '85'), ('Tom', '19', '80')]`

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

We use itemgetter to enable multiple sort keys.

```
In [*]: from operator import itemgetter

people_info = []
while True:
    individual_info = input()

    if individual_info == "":
        break
    else:
        people_info.append(tuple(individual_info.split(",")))

people_info.sort(key = itemgetter(0, 1, 2))
print(people_info)
```

**### Question 20**

Level 3

Question:

Define a class with a generator which can iterate the numbers, which are divisible by 7, between a given range 0 and n.

Hints:

Consider use yield

```
In [*]: def putNumbers(n):
        i = 0
        while i<n:
            j=i
            i=i+1
            if j%7==0:
                yield j
        for i in putNumbers(100):
            print i
```

**### Question 21**

Level 3

Question

A robot moves in a plane starting from the original point (0,0). The robot can move toward UP, DOWN, LEFT and RIGHT with a given steps. The trace of robot movement is shown as the following:

UP 5

DOWN 3

LEFT 3

RIGHT 2

i •

The numbers after the direction are steps. Please write a program to compute the distance from current position after a sequence of movement and original point. If the distance is a float, then just print the nearest integer.

Example:

If the following tuples are given as input to the program:

UP 5

DOWN 3

LEFT 3

RIGHT 2

Then, the output of the program should be:

2

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.



```
In [*]: import math
pos = [0,0]
while True:
    s = raw_input()
    if not s:
        break
    movement = s.split(" ")
    direction = movement[0]
    steps = int(movement[1])
    if direction=="UP":
        pos[0]+=steps
    elif direction=="DOWN":
        pos[0]-=steps
    elif direction=="LEFT":
        pos[1]-=steps
    elif direction=="RIGHT":
        pos[1]+=steps
    else:
        pass

print int(round(math.sqrt(pos[1]**2+pos[0]**2)))
```

### ### Question 22

Level 3

Question:

Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically.

Suppose the following input is supplied to the program:

New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3.

Then, the output should be:

2:2

3.:1

3?:1

New:1

Python:5

Read:1

and:1

between:1

choosing:1

or:2

to:1

Hints

In case of input data being supplied to the question, it should be assumed to be a console input.

```
In [*]: freq = {}    # frequency of words in text
line = raw_input("Enter Text:")
for word in line.split():
    freq[word] = freq.get(word,0)+1

words = freq.keys()
words.sort()

print "Frequency chart"
for w in words:
    print "%s:%d" % (w,freq[w])
```

### ### Question 23

level 1

Question:

Write a method which can calculate square value of number

Hints:

Using the \*\* operator

```
In [*]: a=input()
ans=a**2
print(ans)
```

### ### Question 24

Level 1

Question:

Python has many built-in functions, and if you do not know how to use it, you can read document online or find some books. But Python has a built-in document function for every built-in functions.

Please write a program to print some Python built-in functions documents, such as abs(), int(), raw\_input()

And add document for your own function

Hints:

The built-in document method is `__doc__`

```
In [*]: print abs.__doc__
print int.__doc__
print raw_input.__doc__

def square(num):
    '''Return the square value of the input number.

    The number must be integer.
    '''
    return num ** 2

print square(2)
print square.__doc__
```

### ### Question 25

Level 1

Question:

Define a class, which have a class parameter and have a same instance parameter.

Hints:

Define a instance parameter, need add it in `__init__` method  
You can init a object with construct parameter or set the value later

In [ ]:

### ### Question 26:

Define a function which can compute the sum of two numbers.

Hints:

Define a function with two numbers as arguments. You can compute the sum in the function and return the value.

```
In [*]: a=input()
b=input()
ans=a+b
print(ans)
```

### ### Question 27

Define a function that can convert a integer into a string and print it in console.

Hints:

Use `str()` to convert a number to string.

```
In [*]: n=int(input())
        n_str=str(n)
        print(n)
```

### ### Question 28\_Same as 27

Define a function that can convert a integer into a string and print it in console.

Hints:

Use str() to convert a number to string.

### ### Question 29

Define a function that can receive two integral numbers in string form and compute their sum and then print it in console.

Hints:

Use int() to convert a string to integer.

```
In [*]: def printValue(s1,s2):
        print int(s1) + int(s2)
        printValue("3","4")
```

### ### Question 30

Define a function that can accept two strings as input and concatenate them and then print it in console.

Hints:

Use + to concatenate the strings

```
In [*]: def printValue(s1,s2):
        print s1 + s2

        printValue("3","4")
```

### ### Question 31

Define a function that can accept two strings as input and print the string with maximum length in console. If two strings have the same length, then the function should print al l strings line by line.

Hints:

Use len() function to get the length of a string

```
In [*]: def printValue(s1,s2):
        len1 = len(s1)
        len2 = len(s2)
        if len1 > len2:
            print s1
        elif len2 > len1:
            print s2
        else:
            print s1
            print s2

        printValue("one","three")
```

### ### Question 32

Define a function that can accept an integer number as input and print the "It is an even number" if the number is even, otherwise print "It is an odd number".

Hints:

Use % operator to check if a number is even or odd.

```
In [*]: print ("Enter an integer number to check:\n")

x = int (input ())

if (x % 2 == 0):
    print ("The number is even.\n")
else:
    print ("The number is odd.\n")
```

### ### Question 33

Define a function which can print a dictionary where the keys are numbers between 1 and 3 (both included) and the values are square of keys.

Hints:

Use dict[key]=value pattern to put entry into a dictionary.  
Use \*\* operator to get power of a number.

```
In [*]: def generate_dict(number):
        return {i:i**2 for i in range(1,number+1)}

        print(generate_dict(3))
```

**### Question 34**

Define a function which can print a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys.

Hints:

Use dict[key]=value pattern to put entry into a dictionary.  
Use \*\* operator to get power of a number.  
Use range() for loops.

```
In [*]: def generate_dict(number):  
        return {i:i**2 for i in range(1,number+1)}  
  
        print(generate_dict(20))
```

**### Question 35**

Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the values only.

Hints:

Use dict[key]=value pattern to put entry into a dictionary.  
Use \*\* operator to get power of a number.  
Use range() for loops.  
Use keys() to iterate keys in the dictionary. Also we can use item() to get key/value pairs.

```
In [*]: def printdictionary():  
        dictttonary=dict()  
        for i in range(1,21):  
            dictionary[i]=i**2  
        for (x,y) in dictionary.items():  
            print(x,y)  
  
        printdictionary()
```

**### Question 36**

Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the keys only.

Hints:

Use dict[key]=value pattern to put entry into a dictionary.

Use \*\* operator to get power of a number.

Use range() for loops.

Use keys() to iterate keys in the dictionary. Also we can use item() to get key/value pairs.

```
In [*]: sq = dict(enumerate([i ** 2 for i in range(1, 21)], 1))
        for _, val in sq.items():
            print(val)
```

**### Question 37**

Define a function which can generate and print a list where the values are square of numbers between 1 and 20 (both included).

Hints:

Use \*\* operator to get power of a number.

Use range() for loops.

Use list.append() to add values into a list.

```
In [*]: def printValues():
        l = list()
        for i in range(1,21):
            l.append(i**2)
        print(l)

        printValues()
```

**### Question 38**

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the first 5 elements in the list.

Hints:

Use \*\* operator to get power of a number.

Use range() for loops.

Use list.append() to add values into a list.

Use [n1:n2] to slice a list

```
In [ ]: def printValues():  
        l = list()  
        for i in range(1,21):  
            l.append(i**2)  
        print(l[:5])  
  
printValues()
```

### ### Question 39

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the last 5 elements in the list.

Hints:

Use \*\* operator to get power of a number.  
Use range() for loops.  
Use list.append() to add values into a list.  
Use [\[n1:n2\]](#) to slice a list

```
In [ ]: def printValues():  
        l = list()  
        for i in range(1,21):  
            l.append(i**2)  
        print(l[-5:])  
  
printValues()
```

### ### Question 40

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print all values except the first 5 elements in the list.

Hints:

Use \*\* operator to get power of a number.  
Use range() for loops.  
Use list.append() to add values into a list.  
Use [\[n1:n2\]](#) to slice a list

```
In [*]: def printValues():  
        l = list()  
        for i in range(1,21):  
            l.append(i**2)  
        print l[5:]  
  
printValues()
```



**### Question 41**

Define a function which can generate and print a tuple where the value are square of numbers between 1 and 20 (both included).

Hints:

Use `**` operator to get power of a number.

Use `range()` for loops.

Use `list.append()` to add values into a list.

Use `tuple()` to get a tuple from a list.

```
In [ ]: def printValues():  
        l = list()  
        for i in range(1,21):  
            l.append(i**2)  
        print(l)  
  
printValues()
```

**### Question 42**

With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

Hints:

Use `[n1:n2]` notation to get a slice from a tuple.

```
In [ ]: tup=(1,2,3,4,5,6,7,8,9,10)  
  
tup1=tup[:5]  
  
tup2=tup[5:]  
  
print(tup1)  
  
print(tup2)
```

**### Question 43**

Write a program to generate and print another tuple whose values are even numbers in the given tuple (1,2,3,4,5,6,7,8,9,10).

Hints:

Use "for" to iterate the tuple

Use `tuple()` to generate a tuple from a list.

```
In [ ]: evenTuple = (1,2,3,4,5,6,7,8,9,10)
print("Tuple Items = ", evenTuple)
for i in range(len(evenTuple)):
    if(evenTuple[i] % 2 == 0):
        print(evenTuple[i], end = " ")
```

### ### Question 44

Write a program which accepts a string as input to print "Yes" if the string is "yes" or "YES" or "Yes", otherwise print "No".

Hints:

Use if statement to judge condition.

```
In [*]: tup=(1,2,3,4,5,6,7,8,9,10)
l=list()
for l in tup:
    if tp[i]%2==0:
        l.append(tup[i])

tup2=tuple(l)
print(tup2)
```

### ### Question 45

Write a program which can filter even numbers in a list by using filter function. The list is: [\[1,2,3,4,5,6,7,8,9,10\]](#).

Hints:

Use filter() to filter some elements in a list.  
Use lambda to define anonymous functions.

```
In [ ]: li = [1,2,3,4,5,6,7,8,9,10]
evenNumbers = filter(lambda x: x%2==0, li)
print(evenNumbers)
```

### ### Question 46

Write a program which can map() to make a list whose elements are square of elements in [\[1,2,3,4,5,6,7,8,9,10\]](#).

Hints

Use map() to generate a list.  
Use lambda to define anonymous functions.

```
In [ ]: def square(x):  
        return x*x  
  
numbers = [1,2,3,4,5,6]  
squares = map(square, numbers)  
  
print(str(squares))
```

### ### Question 47

Write a program which can map() and filter() to make a list whose elements are square of even number in [\[1,2,3,4,5,6,7,8,9,10\]](#).

Hints

Use map() to generate a list.

Use filter() to filter elements of a list.

Use lambda to define anonymous functions.

```
In [ ]: li = [1,2,3,4,5,6,7,8,9,10]  
evennums = map(lambda x: x**2, filter(lambda x: x%2==0, li))  
print(evennums)
```

### ### Question 48

Write a program which can filter() to make a list whose elements are even number between 1 and 20 (both included).

Hints:

Use filter() to filter elements of a list.

Use lambda to define anonymous functions.

```
In [ ]: evennums = filter(lambda x: x%2==0, range(1,21))  
print(evennums)
```

### ### Question 49

Write a program which can map() to make a list whose elements are square of numbers between 1 and 20 (both included).

Hints

Use map() to generate a list.

Use lambda to define anonymous functions.

```
In [ ]: squarednums = filter(lambda x: x**2, range(1,21))  
print(squarednums)
```

**### Question 50**

Define a class named American which has a static method called printNationality.

Hints:

Use @staticmethod decorator to define class static method.

```
In [ ]: class American(object):
        @staticmethod
        def printNationality():
            print("America")

anAmerican = American()
anAmerican.printNationality()
American.printNationality()
```

**### Question 51**

Define a class named American and its subclass NewYorker.

Hints:

Use class Subclass(ParentClass) to define a subclass.

```
In [ ]: class American:
        pass

        class NewYorker(American):
            pass

american = American()
newyorker = NewYorker()

print(americans)
print(newyorkers)
```

**### Question 52**

Define a class named Circle which can be constructed by a radius. The Circle class has a method which can compute the area.

Hints:

Use `def methodName(self)` to define a method.

```
In [ ]: class Circle:
        def __init__(self, radius):
            self.radius = radius
        def area(self):
            return (self.radius**2*3.14)
circle = Circle(5)
print(circle.area())
```

**### Question 53**

Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area.

Hints:

Use `def methodName(self)` to define a method.

```
In [ ]: class Rectangle():
        def __init__(self,l,w):
            self.length = l
            self.width = w

        def area(self):
            return self.length*self.width

rect = Rectangle(2,4)
print(rect.area())
```

### ### Question 54

Define a class named Shape and its subclass Square. The Square class has an init function which takes a length as argument. Both classes have a area function which can print the area of the shape where Shape's area is 0 by default.

Hints:

To override a method in super class, we can define a method with the same name in the super class.

```
In [ ]: class Rectangle():
        def __init__(self,l,w):
            self.length = l
            self.width = w

        def area(self):
            return self.length*self.width

rect = Rectangle(2,4)
print(rect.area())
```

### ### Question 55

Please raise a RuntimeError exception.

Hints:

Use raise() to raise an exception.

```
In [ ]: raise RuntimeError('something wrong')
```

**### Question 56**

Write a function to compute  $5/0$  and use try/except to catch the exceptions.

Hints:

Use try/except to catch exceptions.

```
In [ ]: def divide():  
        return 5/0  
  
        try:  
            divide()  
        except ZeroDivisionError as ze:  
            print("Why are you dividing by ZERO!!")  
        except:  
            print("Any other exceptions")
```

**### Question 57**

Define a custom exception class which takes a string message as attribute.

Hints:

To define a custom exception, we need to define a class inherited from Exception.

```
In [ ]: class CustomException(Exception):
        """Exception raised for custom purpose

        Attributes:
            message -- explanation of the error
        """

        def __init__(self, message):
            self.message = message

num = int(input())

try:
    if num < 10:
        raise CustomException("Input is less than 10")
    elif num > 10:
        raise CustomException("Input is grater than 10")
except CustomException as ce:
    print("The error raised: " + ce.message)
```

### ### Question 58

Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the user name of a given email address. Both user names and company names are composed of letters only.

Example:

If the following email address is given as input to the program:

john@google.com

Then, the output of the program should be:

john

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use \w to match letters.

```
In [ ]: email = "john@google.com"
email = email.split('@')
print(email[0])
import re
```



**### Question 59**

Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the company name of a given email address. Both user names and company names are composed of letters only.

Example:

If the following email address is given as input to the program:

john@google.com

Then, the output of the program should be:

google

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use \w to match letters.

```
In [ ]: email = "john@google.com rilty@gmail.com"
        pattern = "\w+@(\w+).com"
        ans = re.findall(pattern,email)
        print(ans)
```

**### Question 60**

Write a program which accepts a sequence of words separated by whitespace as input to print the words composed of digits only.

Example:

If the following words is given as input to the program:

2 cats and 3 dogs.

Then, the output of the program should be:

['2', '3']

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use re.findall() to find all substring using regex.

```
In [ ]: import re

email = input()
pattern = "\d+"
ans = re.findall(pattern,email)
print(ans)
```