23th April 2021

Previous Day

- Functions
  - programs

Doubt Class

Lecture Flow

- how to print a full pyramid with one loop
- Using break/continue on a nested loop of days and weeks (which you take as user input), skip out on the even days of all odd weeks .
- Write a function to print the factorial of any number.
- Print the pyramid, take input as line number.

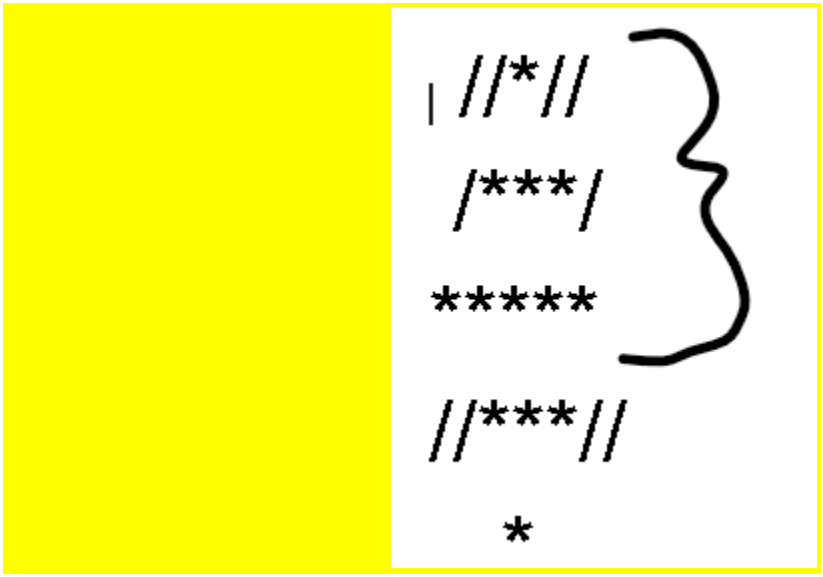
Topics & Explanations

1. How to print a full pyramid with one loop ?

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

```
38  n = input("Enter in the total number of lines: ")
39  n = int(n)
40  for ln in range(1, n+1):
41      if ln <= (n//2+n%2):
42          print(" "*((n//2+n%2)-ln), end= "")
43          print("*"*(2*ln-1))
44      else:
45          if n%2 == 1:
46              print(" "*(ln-(n//2+n%2)), end= "")
47              print("*"*(2*(n+1-ln)-1))
48          else:
49              print(" "*(ln-(n//2+n%2)-1), end= "")
50              print("*"*(2*(n+1-ln)-1))
```

- line38, we took input
- line39, converted to integer
- line40, ran the loop from 1 to last eg., 1 to n+1
- line41, we checked the condition if the loop is under the halfway
- line42, print spaces X (halfway-line), halfway has a fixed formula and is fixed for every complete pattern. So, for the 1st half of the pyramid we are doing (halfway - 1,2,3), because the line is in the for loop. This will print the spaces which is denoted by "/"



- line43, In this line we are printing the stars. So, in the 1st line we have 1 star, in 2nd have 3 stars, 3rd line have 5 stars and so on. So 1*,3*,5* these are in odd series which have formula 2n-1
- line 44, else, we are now moving in the 2nd half

- line45, we are checking if the input given by the user is even or not
- line 46, if even then print (line - halfway) where line varies with the loop which prints the spaces
- line 47, prints the star which is odd sequence formula but in the reverse order 2*(input+1-line)-1
- line48, if the input by the user is odd
- line49, print spaces line-halfway-1
- line50. prints stars the same as line 47.

2. Using break/continue on a nested loop of days and weeks (which you take as user input), skip out on the even days of all odd weeks .

```
55  weeks = int(input("Enter the number of weeks: "))
56  days = int(input("Enter the days in a week: "))
57  for week in range(1, weeks+1):
58      for day in range(1, days+1):
59          if week%2==1 and day%2==0:
60              continue
61          print("Week-", week, " Day-", day)
```

- line55, weeks is taken as input
- line56, days is taken as input
- line57, ran the loop for the week from 1 to week
- line 58, ran the nested loop inside the upper loop for the days from 1 to days
- line59, if week is odd also days is even then skip this line
- line 60 , else print week and days

```
~/RichBiodegradableLicenses$ python3 doubts_session.py
Enter the number of weeks: 5
Enter the days in a week: 6
Week- 1  Day- 1
Week- 1  Day- 3
Week- 1  Day- 5
Week- 2  Day- 1
Week- 2  Day- 2
Week- 2  Day- 3
Week- 2  Day- 4
Week- 2  Day- 5
Week- 2  Day- 6
Week- 3  Day- 1
Week- 3  Day- 3
Week- 3  Day- 5
Week- 4  Day- 1
Week- 4  Day- 2
Week- 4  Day- 3
Week- 4  Day- 4
Week- 4  Day- 5
Week- 4  Day- 6
Week- 5  Day- 1
Week- 5  Day- 3
Week- 5  Day- 5
~/RichBiodegradableLicenses$ 2021-0
```

3. Write a function to print the factorial of any number.

Ex:- suppose if input is 5 then output is 5*4*3*2*1=120

```
63  def factorial(n):
64      fact=1
65      for num in range(1, n+1):
66          fact = fact*num
67      return fact
68
69  factorial_26 = factorial(26)
```

- line63, function name factorial is made with variable n
- line64, initialize fact=1
- line65, loop of num from 1 to input +1
- line66, fact is saving the multiplication of num loop
- line67, after calculating fact and the loop ends we are returning the value which is stored in fact.

- line69, we took variable of any name like factorial_26 , and in that we call the function factorial with input 26 (input also called arguments here)

4. Print the pyramid, take input as line number.

1
21
321
4321
54321

```
111  n = int(n)
112  for ln in range(1, n+1):
```

```
117      for digit in range(ln,0,-1):
118          print(digit, end="")
119      print()
```

- line111, took input and typecasted
- line112, run the loop of ln from 1 to input + 1
- line117, ran the loop from digit from ln to 0 in negative
- line118, print the digit
- line119, print () changing the line into the next line.