WHY TO USE LOOPS?

* If a software developer develops a software a software module for payroll processing that needs to compute the salaries and the bonus of all the employees.

WHAT ARE LOOPS?

* Loops allows the execution of a statement or group of statement multiple times.
* In order to enter the loop there are certain conditions defined in the beginning.
* Once the condition becomes false the loop stops and control moves out of loop.

LOOPS

1. WHILE
   1. While loops are known as indefinite or conditional loops. They will keep iterating until certain conditions are met. There is no guarantee ahead of time regarding how many times loop will iterate.
   2. Syntax:
      1. While expression:

Statements

* 1. Example: Random Guess Number

**import** random  
n = 20  
to\_be\_guessed = int(n \* random.random()) + 1  
guess = 0  
  
**while** guess != to\_be\_guessed:  
 guess = int(input(**"New Number: "**))  
 **if** guess > 0:  
 **if** guess > to\_be\_guessed:  
 print(**"Number is too large"**)  
 **elif** guess < to\_be\_guessed:  
 print(**"Number is too small"**)  
  
 **else**:  
 print(**"Sorry! You give up"**)  
 **break  
  
else**:  
 print(**"Congratulations! You made it"**)

1. FOR
   1. For loop is a python loop, which repeats a group of statements, a specified number of times. The FOR loop provides a syntax where following information is provided:
      1. Boolean Condition
      2. The initial value of counting variable.
      3. Incremination of counting variable.
   2. Syntax:
      1. For <variable> in <range>:

Stmnt 1

Stmnt 2

. . . . . .

Stmnt n

* 1. Example: Factorial

num = int(input(**"Enter number: "**))  
factorial = 1  
  
**if** num < 0:  
 print(**"Number must be positive"**)  
**elif** num == 0:  
 print(**"Factorial: "**, factorial)  
**else**:  
 **for** i **in** range(1, num + 1):  
 factorial = factorial \* i  
print(factorial)

1. NESTED
   1. Python programming language allows use of loop inside another loop. This is called Nested Loop, below syntax is same:
   2. For iterating\_var in sequence:

For iterating\_var in sequence:

Statements

Statements

* 1. While expression:

While expression:

Statements

Statements

* 1. Example ATM BANK:

print(**"Welcome to bank"**)  
chances = 3  
  
restart = (**'Y'**)  
balance = 1000  
  
**while** chances >= 0:  
 pin = int(input(**"Enter your pin number: "**))  
 **if** pin == (1234):  
 print(**"Enter Successful"**)  
  
 **while** restart **not in** (**'N'**):  
 print(**"press 1 for balance: \n"**)  
 print(**"press 2 for withdrawl: \n"**)  
 print(**"press 3 for pay in: \n"**)  
 print(**"press 4 for return card: \n"**)  
  
 option = int(input(**"Enter your option: "**))  
 **if** option == 1:  
 print(**"Your balance is Rs. "**, balance)  
 restart = input(**"Would you like to go back: "**)  
 **if** restart **in** (**'N'**):  
 print(**"Thank you"**)  
 **break  
 elif** option == 2:  
 option2 = (**'Y'**)  
 withdrawl = float(input(**'How much would you like to draw ? \n Rs. 10 Rs. 20 Rs. 50 Rs. 100 Rs. 500 Rs. 1000 Rs. 5000: '** ))  
 **if** withdrawl **in** [10,20,50,100,500,1000,5000]:  
 balance = balance - withdrawl  
 print(**"Your Balance is now Rs. "**, balance)  
 restart = input(**"Would you like to go back: "**)  
 **if** restart **in** (**'N'**):  
 print(**"Thank you"**)  
 **break  
 elif** withdrawl != [10,20,50,100,500,1000,5000]:  
 print(**"Invalid amount, please try again"**)  
 restart = (**'y'**)  
 **elif** withdrawl == 1:  
 withdrawl = float(input(**'please enter desire amount:'**))  
 balance = balance - withdrawl  
  
 **elif** option == 3:  
 pay\_in = float(input(**'how much you would like to pay: '**))  
 balance = balance + pay\_in  
 print(**"Your Balance is now Rs. "**, balance)  
 restart = input(**"Would you like to go back: "**)  
 **if** restart **in** (**'N'**):  
 print(**"Thank you"**)  
 **break  
 elif** option == 4:  
 print(**"please wait while your card is returned . . . \n"**)  
 print(**'Thank you for service'**)  
 **break  
 else**:  
 print(**'Enter correct number please. \n'**)  
 restart = (**'y'**)  
  
 **elif** pin != (1234):  
 chances = chances - 1  
 **if** chances == 0:  
 print(**"\nNo more tries!"**)  
 **break**

* 1. Example: Pythagorean numbers

**from** math **import** sqrt  
n = int(input(**"Max number: "**))  
  
**for** a **in** range(1, n + 1):  
 **for** b **in** range(a, n):  
 csquare = a\*\*2 + b\*\*2  
 c = int(sqrt(csquare))  
  
 **if**((csquare - c\*\*2) == 0):  
 print(a,b,c)

* 1. Example: Reservation

travelling = input(**"Yes or No"**)  
  
**while** travelling == **'Yes'**:  
 num = int(input(**"Enter no of people: "**))  
  
 **for** i **in** range(1, num+1):  
 name = input(**"Name:"**)  
 age = input(**"Age: "**)  
 sex = input(**"Male or Female"**)  
  
 print(name)  
 print(age)  
 print(sex)  
  
 travelling = input(**'forgot something'**)