

Python Loops

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LOOPS

- **for loop**: Repeats a set of statements over a group of values.

- Syntax:

```
for variableName in groupOfValues:  
    statements
```

- We indent the statements to be repeated with tabs or spaces.
- **variableName** gives a name to each value, so you can refer to it in the **statements**.
- **groupOfValues** can be a range of integers, specified with the `range` function.

- Example:

```
for x in range(1, 6):  
    print(x, "squared is", x * x)
```

Output:

```
1 squared is 1  
2 squared is 4  
3 squared is 9  
4 squared is 16  
5 squared is 25
```

- The `range` function specifies a range of integers:
 - `range(start, stop)` - the integers between **start** (inclusive) and **stop** (exclusive)
- It can also accept a third value specifying the change between values.
 - `range(start, stop, step)` - the integers between **start** (inclusive) and **stop** (exclusive) by **step**

■ Example:

```
for x in range(5, 0, -1):  
    print(x)  
print("Blastoff!")
```

Output:

```
5  
4  
3  
2  
1  
Blastoff!
```

```
sum = 0  
for i in range(1, 11):  
    sum = sum + (i * i)  
print("sum of first 10 squares is", sum)
```

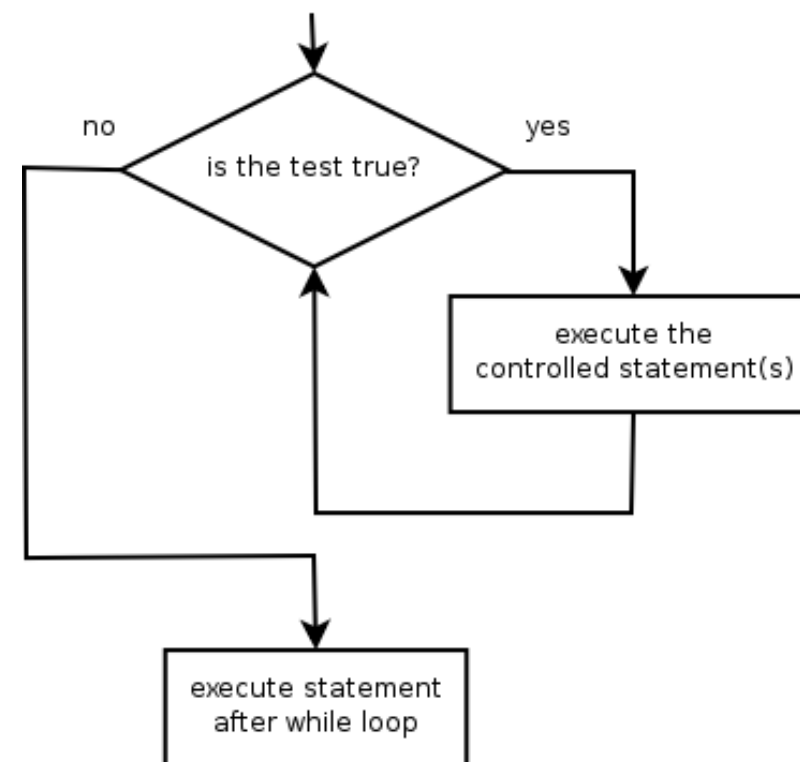
Output:

```
sum of first 10 squares is 385
```

- **while loop:** Executes a group of statements as long as a condition is True.
 - good for *indefinite loops* (repeat an unknown number of times)

- Syntax:

`while condition :`
`statements`

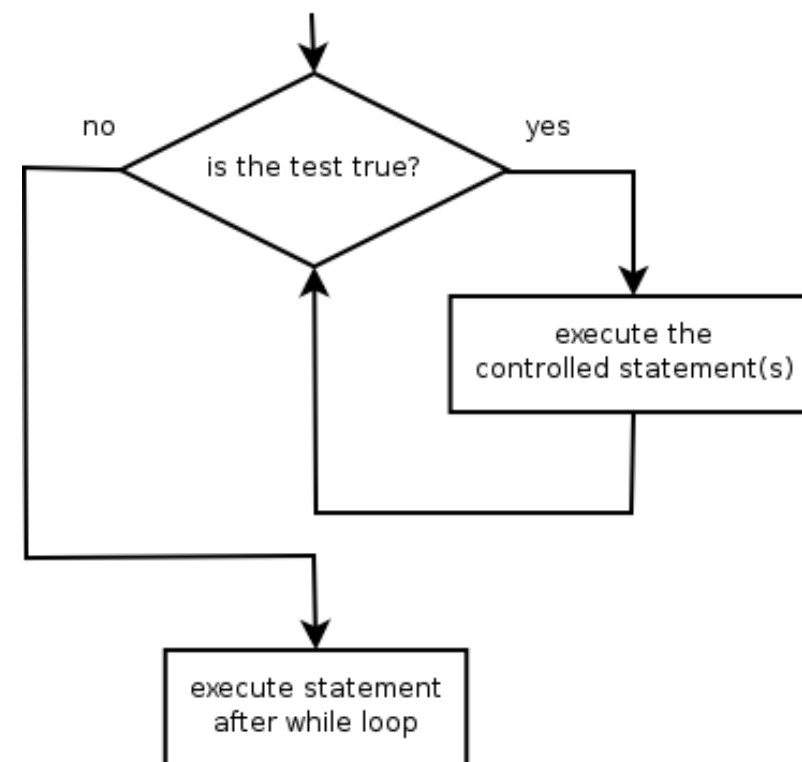


■ Example:

```
number = 1  
while number < 200:  
    print(number)  
    number = number * 2
```

■ Output:

1 2 4 8 16 32 64 128



- Check whether given number is prime or composite

SUMMARY

- ✓ **How to write Simple Python Code**
- ✓ **Python Language Mechanism**
- ✓ **Each code is sequence of instructions**

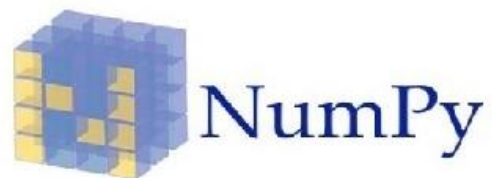
- ✗ **Not easy for larger problems**
- ✗ **Difficult to keep track of details**
- ✗ **How do check whether you have given correct input to section of the code**

- Calculate the sum of first n natural numbers.
- Find all prime numbers between 1 to n .
- Get the number of voters (at least 6). Each voter should vote for one of the following choices.
 1. Cup
 2. Candle
 3. Chalk
 4. Pen
 5. PencilCount the number of votes for each choice and then print.
- Calculate the sum of entries of an $n \times n$ matrix without their diagonal and anti-diagonal entries.

- Calculate the sum of first n even natural numbers. Receive n as an input.
- Calculate the sum of first n natural numbers which are divisible by 7 but not divisible by 63.
- Calculate the sum of fourth power of first n natural numbers.
- If the user enters a non-negative number, ask for a positive number (Use while loop)
- Get an input of positive or negative integer until zero is given. Terminate the program when the input is zero. Find the minimum, maximum and average of all numbers fed as input (Use for loop and break statement).
- Calculate the factorial of a non-negative integer.



End of Python Loops



IP[y]:
IPython

