1. Area of a Circle

```
import math
r = float(input("Enter radius: "))
area = math.pi * r ** 2
print("Area of the circle:", area)
```

2. Shuffle and Print a List

```
import random
lst = [1, 2, 3, 4, 5]
random.shuffle(lst)
print("Shuffled list:", lst)
```

3. Sort Dictionary by Values (lambda)

```
d = {'apple': 10, 'banana': 5, 'cherry': 7}
sorted_d = dict(sorted(d.items(), key=lambda item: item[1]))
print(sorted_d)
```

4. Sort Dictionary (itemgetter)

```
from operator import itemgetter
d = {'apple': 10, 'banana': 5, 'cherry': 7}
sorted_d = dict(sorted(d.items(), key=itemgetter(1)))
print(sorted_d)
```

5. Dictionary Comprehension Sort

```
d = {'apple': 10, 'banana': 5, 'cherry': 7}
sorted_d = {k: v for k, v in sorted(d.items(), key=lambda x: x[1])}
print(sorted_d)
```

6. Swap Two Variables (No Temp)

```
a = 5
b = 10
a, b = b, a
print("a:", a, "b:", b)
```

7. Biggest Among 3 Numbers

```
a = int(input("Enter 1st number: "))
b = int(input("Enter 2nd number: "))
c = int(input("Enter 3rd number: "))
if a >= b and a >= c:
    print("Biggest is:", a)
elif b >= a and b >= c:
    print("Biggest is:", b)
else:
```

```
    print("Biggest is:", c)
```

8. Factorial (Iteration)

```
n = int(input("Enter a number: "))
fact = 1
for i in range(1, n+1):
    fact *= i
print("Factorial:", fact)
```

9. Factorial (Recursion)

```
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

num = int(input("Enter a number: "))
if num < 0:
    print("Factorial is not defined for negative numbers.")
else:
    print(f"Factorial of {num} is: {factorial(num)}")
```

10. Armstrong Number

```
n = int(input("Enter a number: "))
sum = 0
temp = n
power = len(str(n))
while temp > 0:
    digit = temp % 10
    sum += digit ** power
    temp //= 10
print("Armstrong" if sum == n else "Not Armstrong")
```

11. Fibonacci Series (Loop)

```
n = int(input("Enter number of terms: "))
a, b = 0, 1
for _ in range(n):
    print(a, end=" ")
    a, b = b, a + b
```

12. Fibonacci Series (Recursion)

```
def fib(n):
    if n <= 1:
        return n
    else:
        return fib(n-1) + fib(n-2)
```

```
terms = int(input("Enter number of terms: "))
for i in range(terms):
    print(fib(i), end=" ")
```

13. Check Prime or Not

```
n = int(input("Enter a number: "))
if n < 2:
    print("Not Prime")
else:
    for i in range(2, int(n**0.5)+1):
        if n % i == 0:
            print("Not Prime")
            break
    else:
        print("Prime")
```

14. Generate Primes up to N

```
n = int(input("Enter upper limit: "))
for num in range(2, n+1):
    for i in range(2, int(num**0.5)+1):
        if num % i == 0:
            break
    else:
        print(num, end=" ")
```

15. Square Root

```
import math
n = float(input("Enter a number: "))
print("Square root:", math.sqrt(n))
```

16. GCD of Two Numbers

```
import math
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))
print("GCD is:", math.gcd(a, b))
```

17. Linear Search

```
lst = [10, 20, 30, 40, 50]
target = int(input("Enter number to search: "))
for i in range(len(lst)):
    if lst[i] == target:
        print("Found at index", i)
        break
else:
    print("Not found")
```

18. Binary Search

```
def binary_search(arr, x):
    low = 0
    high = len(arr) - 1
    while low <= high:
        mid = (low + high) // 2
        if arr[mid] == x:
            return mid
        elif arr[mid] < x:
            low = mid + 1
        else:
            high = mid - 1
    return -1

arr = sorted([10, 20, 30, 40, 50])
x = int(input("Enter number to search: "))
result = binary_search(arr, x)
print("Found at index", result) if result != -1 else print("Not found")
```

19. Bubble Sort

```
arr = [64, 25, 12, 22, 11]
n = len(arr)
for i in range(n):
    for j in range(0, n-i-1):
        if arr[j] > arr[j+1]:
            arr[j], arr[j+1] = arr[j+1], arr[j]
print("Sorted array:", arr)
```

20. Read and Write from a File

```
# Writing to a file
with open("sample.txt", "w") as f:
    f.write("Hello, world!\nThis is a test file.")

# Reading from the same file
with open("sample.txt", "r") as f:
    print(f.read())
```