Python & NumPy Programs (Part 2)

11. Check if a number is in a list

```
lst = [int(input(f"Enter element {i+1}: ")) for i in range(5)]
num = int(input("Enter a number to search: "))
if num in lst:
    print("Number found in list.")
else:
    print("Number not in list.")
```

12. Count words in a text file

```
file_path = input("Enter filename: ")
with open(file_path, 'r') as file:
    text = file.read()
    words = text.split()
    print("Total words:", len(words))
```

13. Grade from percentage

```
percent = float(input("Enter percentage: "))
if percent > 90:
    grade = 'A'
elif percent > 80:
    grade = 'B'
elif percent > 70:
    grade = 'C'
elif percent > 60:
    grade = 'D'
elif percent > 50:
    grade = 'E'
else:
    grade = 'F'
print("Grade:", grade)
```

14. Read file line by line into array

```
file_path = input("Enter filename: ")
with open(file_path, 'r') as file:
    lines = file.readlines()
    print("File as array:", lines)
```

15. Check Armstrong number

```
num = int(input("Enter a number: "))
sum = 0
temp = num
n = len(str(num))
while temp > 0:
```

```
    digit = temp % 10
    sum += digit ** n
    temp //= 10
if sum == num:
    print("Armstrong number")
else:
    print("Not an Armstrong number")
```

16. Write to file and display content

```
data = input("Enter text to write to file: ")
with open("output.txt", "w") as file:
    file.write(data)
with open("output.txt", "r") as file:
    content = file.read()
    print("File content:", content)
```

17. Factorial using recursion

```
def factorial(n):
    if n == 0 or n == 1:
        return 1
    return n * factorial(n - 1)
n = int(input("Enter number: "))
print("Factorial:", factorial(n))
```

18. Count even and odd numbers

```
nums = list(map(int, input("Enter numbers separated by space: ").split()))
even = len([x for x in nums if x % 2 == 0])
odd = len([x for x in nums if x % 2 != 0])
print("Even:", even, "Odd:", odd)
```

19. Check prime number

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

20. Check palindrome number

```
num = input("Enter number: ")
if num == num[::-1]:
    print("Palindrome")
else:
```

```
    print("Not a palindrome")
```

21. Prime numbers in a range

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

22. List of first N even natural numbers

```
n = int(input("Enter N: "))
evens = [2*i for i in range(1, n+1)]
print("Even numbers:", evens)
```

23. First 10 Fibonacci numbers

```
a, b = 0, 1
print("Fibonacci series:", end=" ")
for _ in range(10):
    print(a, end=" ")
    a, b = b, a + b
```

24. Compute Simple and Compound Interest

```
p = float(input("Enter principal: "))
r = float(input("Enter rate: "))
t = float(input("Enter time: "))
si = (p * r * t) / 100
ci = p * (pow((1 + r / 100), t)) - p
print("Simple Interest:", si)
print("Compound Interest:", ci)
```

25. Max and Min in a dictionary

```
data = {'a': 5, 'b': 12, 'c': 7, 'd': 3}
max_key = max(data, key=data.get)
min_key = min(data, key=data.get)
print("Max Value:", data[max_key], "at key:", max_key)
print("Min Value:", data[min_key], "at key:", min_key)
```