Exercise 1 –   Check a given year is leap year or not.

Program –

```
    flag=1

    while(flag==1):
        year = int(input("Enter the year: "))
        if((year%400 == 0) or ((year%4 == 0) and (year%100 !=
0))):
            print(str(year) + " is a leap year.")
        else:
            print(str(year) + " is not the leap year.")

        intake=input("Do you wish to continue? (Press y to
continue or any key to exit.): ")

        if(intake=="Y" or intake=="y"):
            flag=1
        else:
            flag=0
            break
```

Exercise 2 –   Check whether a character is alphabet, digit or special character.

Program –

```
    flag=1

    while(flag==1):
        character = input("Enter the character: ")
        if((character >= "A" or character >= "a") and
(character <= "Z" or character <= "z")):
            print("It's an alphabet.")
        elif character.isdigit() is True:
            print("It's an digit.")
        else:
            print("It's an special character.")

        intake=input("Do you wish to continue? (Press y to
continue or any key to exit.): ")

        if(intake=="Y" or intake=="y"):
            flag=1
        else:
            flag=0
            break
```

Exercise 3 – Find GCD of two numbers.

Program –

```python
flag=1

def gcd(a,b):
    if(a>b):
        num=a
        deno=b
    else:
        num=b
        deno=a

    remainder = num%deno

    while(remainder!=0):
        num=deno
        deno=remainder
        remainder = num%deno

    gcd=deno

    return gcd

while(flag==1):
    a=int(input("Enter your 1st number: "))
    b=int(input("Enter your 2nd number: "))

    print("Result: "+ str(gcd(a,b)))

    intake=input("Do you wish to continue? (Press y to
continue or any key to exit.): ")

    if(intake=="Y" or intake=="y"):
        flag=1
    else:
        flag=0
        break
```

Exercise 4 –   Check whether a given number is an Armstrong number or not.

Program –

```python
flag=1

while(flag==1):
    no = input("Enter the number: ")
    length = len(no)

    summ=0
    temp = int(no)
    while(temp!=0):
        remainder=temp%10
        summ+=pow(remainder,length)
        temp=temp//10

    if(summ==int(no)):
        print(no + " is an armstrong number.")
    else:
        print(no + " is not an armstrong number.")

    intake=input("Do you wish to continue? (Press y to
continue or any key to exit.): ")

    if(intake=="Y" or intake=="y"):
        flag=1
    else:
        flag=0
        break
```

Exercise 5 –   Print the Prime numbers between 1 to 100.

Program –

```python
for num in range(2,100 + 1):
if (num > 1):
    for i in range(2,num):
        if (num % i) == 0:
            break
    else:
        print(num, end=" ")
```

Exercise 6 –   Calculate the Sum of even Fibonacci numbers below 4 Thousand.

Program –

```python
def evenFibSum(limit) :
    if (limit < 2) :
        return 0

    f1 = 0
    f2 = 2
    summ = f1+f2

    while (f2 <= limit) :
        f3 = 4*f2 + f1

    if (f3 > limit) :
        break

    f1 = f2
    f2 = f3
    summ = summ + f2

return summ

print("The even fibonacci sum is " + str(evenFibSum(4000)) + ".")
```

Exercise 7 –   Print the following patterns

Program –

i)   **Pattern: 1**

```python
flag=1

while(flag==1):
    rows = int(input("No. of rows: "))
    for i in range(1,rows):
        for y in range(i):
            print("*", end=" ")
        print("")
    intake=input("Do you wish to continue? (Press y
to continue or any key to exit.): ")
```

```python
        if(intake=="Y" or intake=="y"):
            flag=1
        else:
            flag=0
            break
```

ii)   *Pattern: 2*

```python
flag=1

while(flag==1):
    rows = int(input("No. of rows: "))
    k=0
    for i in range(1, rows+1):
        for space in range(1, (rows-i)+1):
            print(end="  ")
        while k != (2*i-1):
            print("* ", end="")
            k = k + 1
        k = 0
        print()

    intake=input("Do you wish to continue? (Press y
to continue or any key to exit.): ")

    if(intake=="Y" or intake=="y"):
        flag=1
    else:
        flag=0
        break
```

iii) *Pattern: 3*

```python
flag=1

while(flag==1):
    rows = int(input("No. of rows: "))
    for i in range(0, rows):
        for l in range(i):
            print('  ', end='')
        for k in range(i + 1, rows):
            print('* ', end='')

        print("")
    intake=input("Do you wish to continue? (Press y
to continue or any key to exit.): ")
    if(intake=="Y" or intake=="y"):
```

```
        flag=1
    else:
        flag=0
        break
```