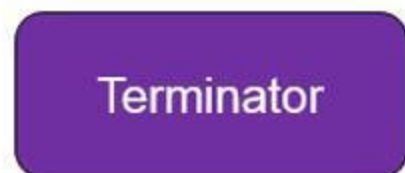# Flowchart Symbols

Flowcharts are used to illustrate algorithms in order to aid in the visualisation of a program.

Flowcharts are to be read top to bottom and left to right in order to follow an algorithms logic from start to finish. Below is an outline of symbols used in flowcharts.

Terminator

Terminator

Used to represent the Start and end of a program with the Keywords BEGIN and END.

Decision

Decision

Used to split the flowchart sequence into multiple paths in order to represent SELECTION and REPETITION.

Process

Process

An instruction that is to be carried out by the program.

Input / Output

Input / Output

Used to represent data entry by a user or the display of data by the program.

Arrow

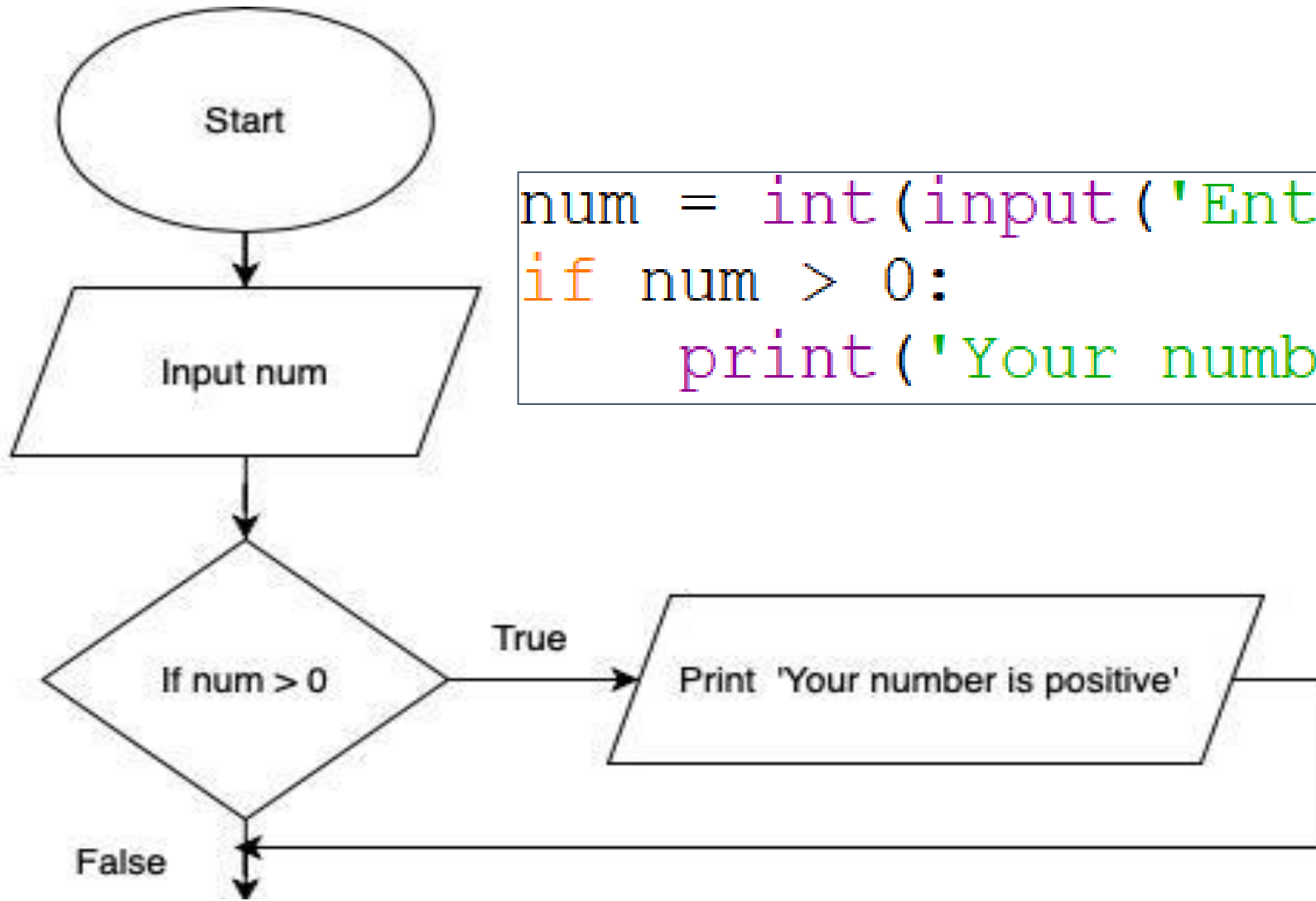Indicates the flow of the algorithm pathways.

Subprogram

Subprogram

References another program within the program.
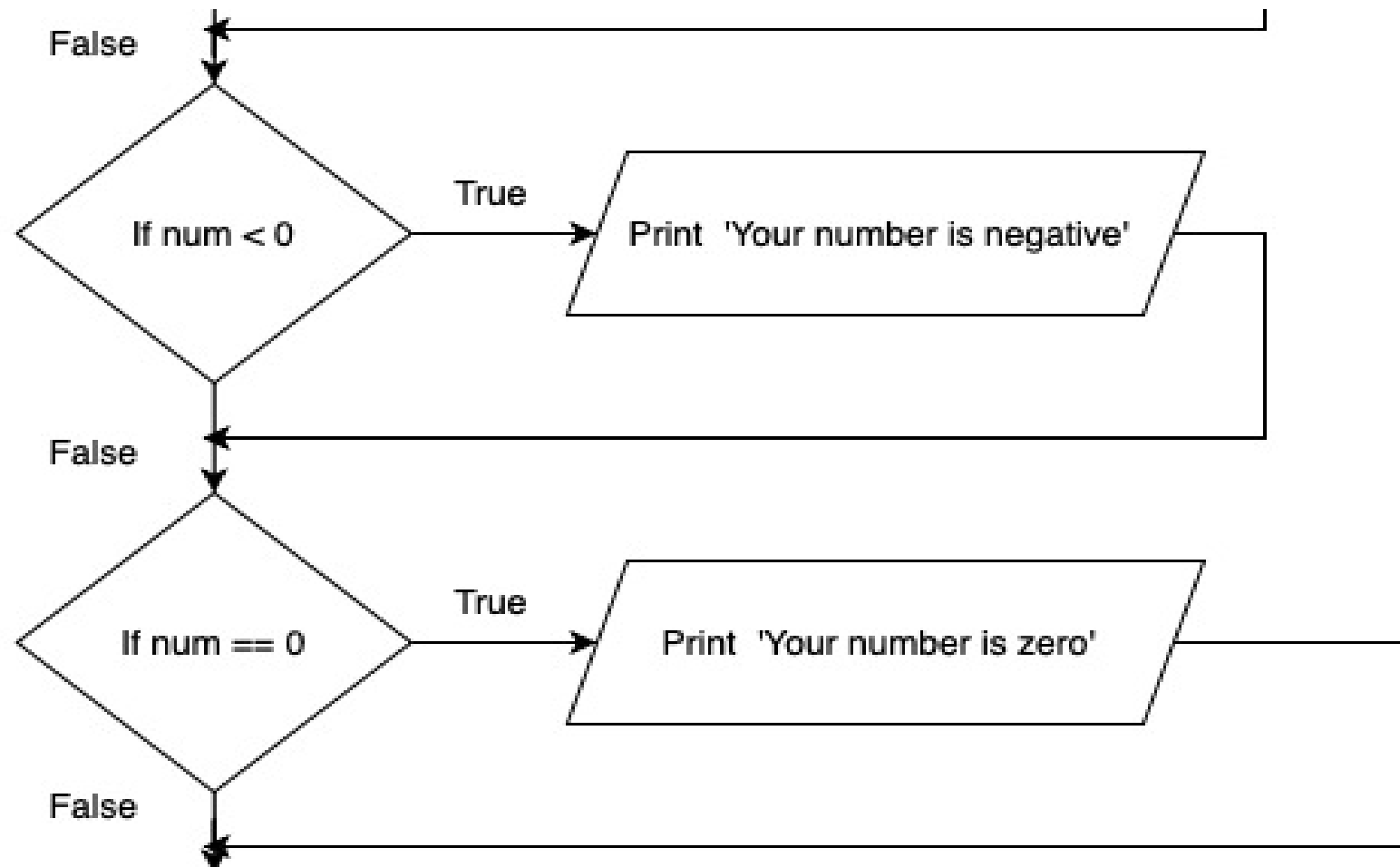
Listing 1 Python program 1

Draw a flowchart for the Python program as shown in Listing 1.

```python
num = int(input('Enter a number: '))
if num > 0:
    print('Your number is positive')
    if num < 0:
        print('Your number is negative')
        if num == 0:
            print('Your number is zero')
            print ('Finished!')
```
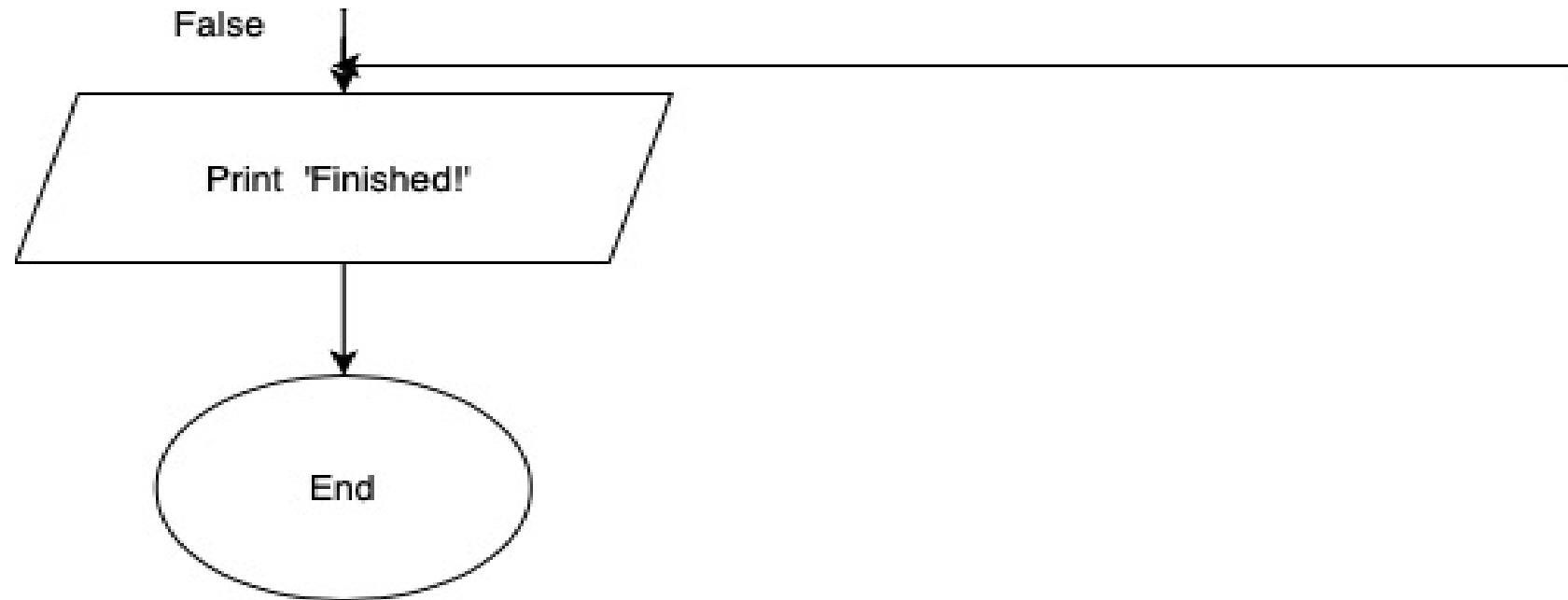
```python
num = int(input('Enter a number: '))
if num > 0:
    print('Your number is positive')
```

Start

Input num

If num > 0

True

Print 'Your number is positive'

False

```python
if num < 0:
    print('Your number is negative')
    if num == 0:
        print('Your number is zero')
```

```python
print ('Finished!')
```
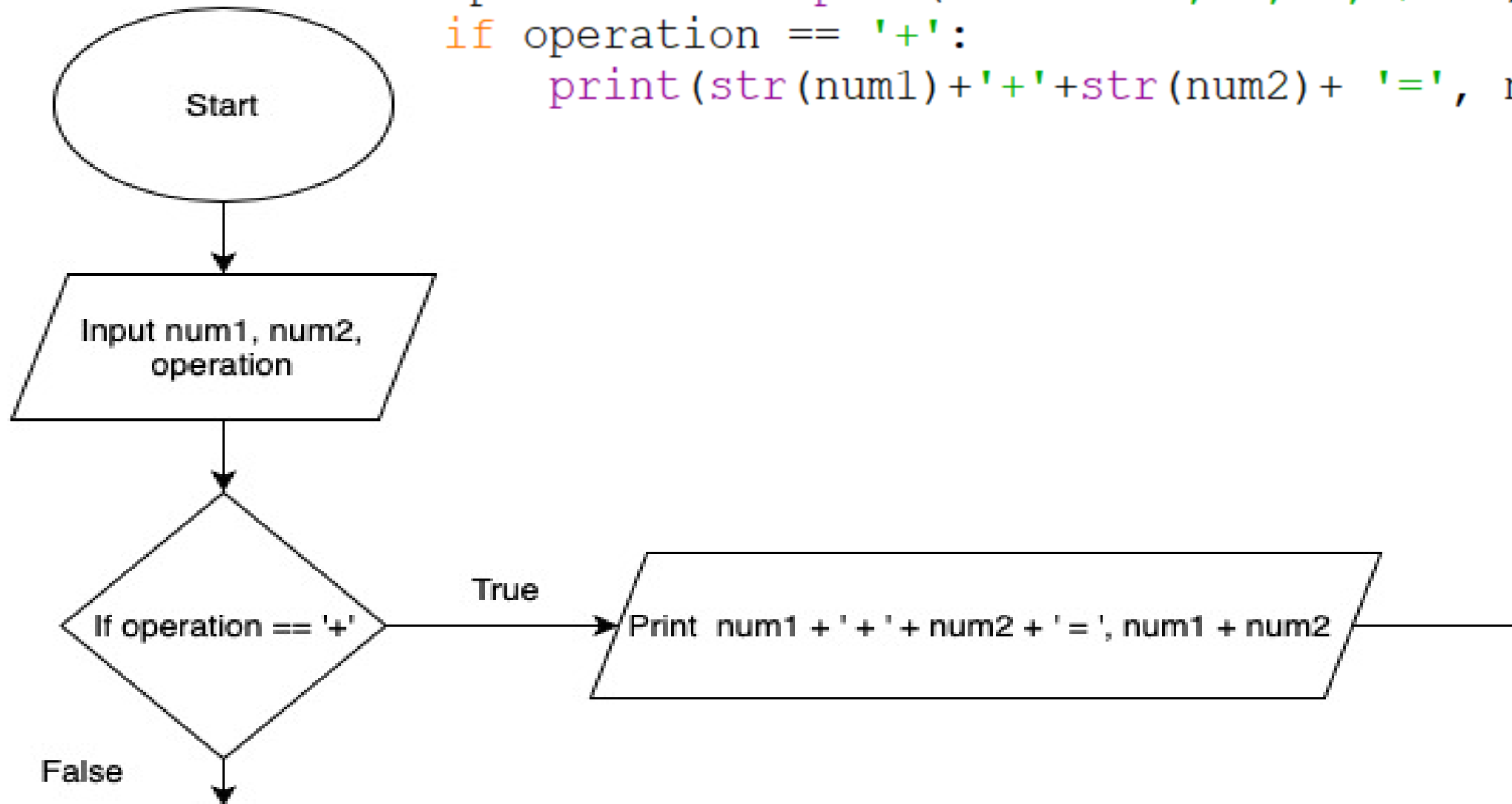
False

Print 'Finished!'
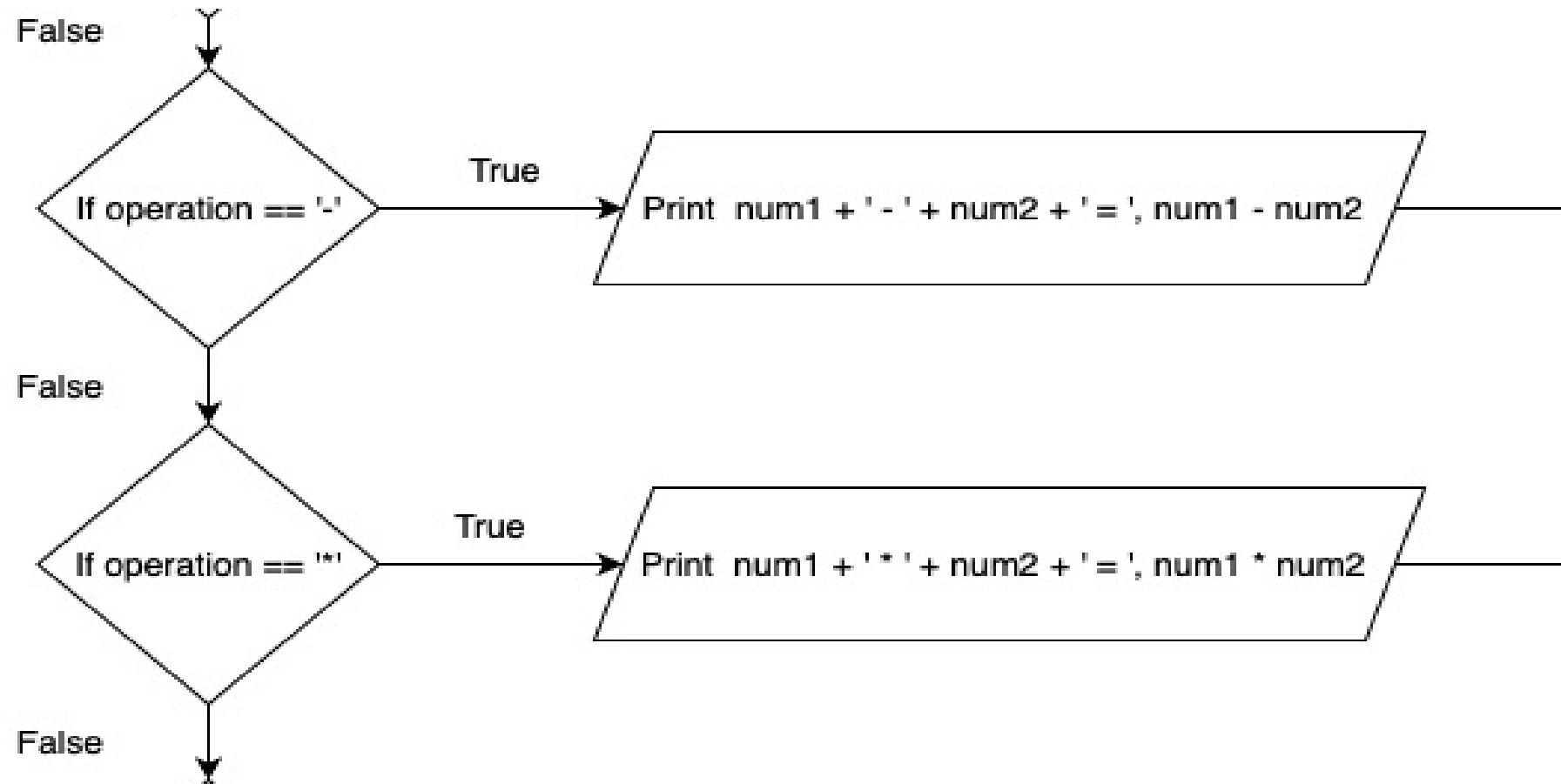
End

Listing 2 Python program 2

Draw a flowchart for the Python program as shown in Listing 2.

```python
num1 = float(input('Enter Num1: '))
num2 = float(input('Enter Num2: '))
operation = input ('Select +, -, *, /: ')
if operation == '+':
    print(str(num1)+'+'+str(num2)+ '=', num1+num2)
elif operation =='-':
    print(str(num1)+'-'+str(num2)+ '=', num1-num2)
elif operation =='*':
    print(str(num1)+'-'+str(num2)+ '=', num1*num2)
elif operation =='/':
    print(str(num1)+'-'+str(num2)+ '=', num1/num2)
else:
    print('ERROR! Wrong Selection.')
```

```python
num1 = float(input('Enter Num1: '))
num2 = float(input('Enter Num2: '))
operation = input ('Select +, -, *, /: ')
if operation == '+':
    print(str(num1)+'+'+str(num2)+ '=', num1+num2)
```

Start

Input num1, num2, operation

If operation == '+'

True

Print num1 + ' + ' + num2 + ' = ', num1 + num2

False

```python
    elif operation =='-':
        print(str(num1)+'-'+str(num2)+ '=', num1-num2)
    elif operation =='*':
        print(str(num1)+'-'+str(num2)+ '=', num1*num2)
```
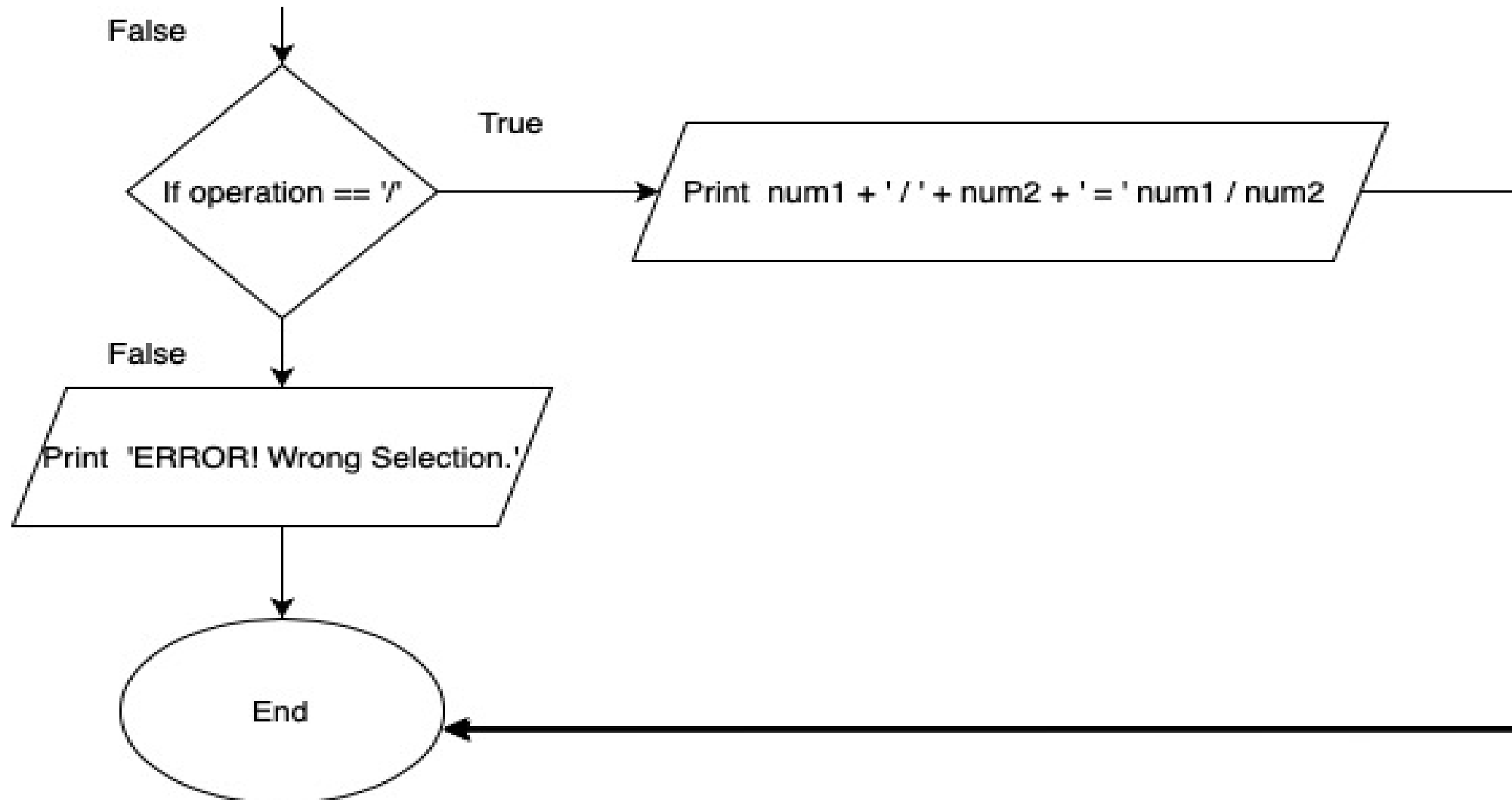
False

If operation == '-' —True→ Print num1 + ' - ' + num2 + ' = ', num1 - num2

False

If operation == '*' —True→ Print num1 + ' * ' + num2 + ' = ', num1 * num2

False

```python
        print(str(num1)+'-'+str(num2)+ '=', num1/num2)
    else:
        print('ERROR! Wrong Selection.')
```

False

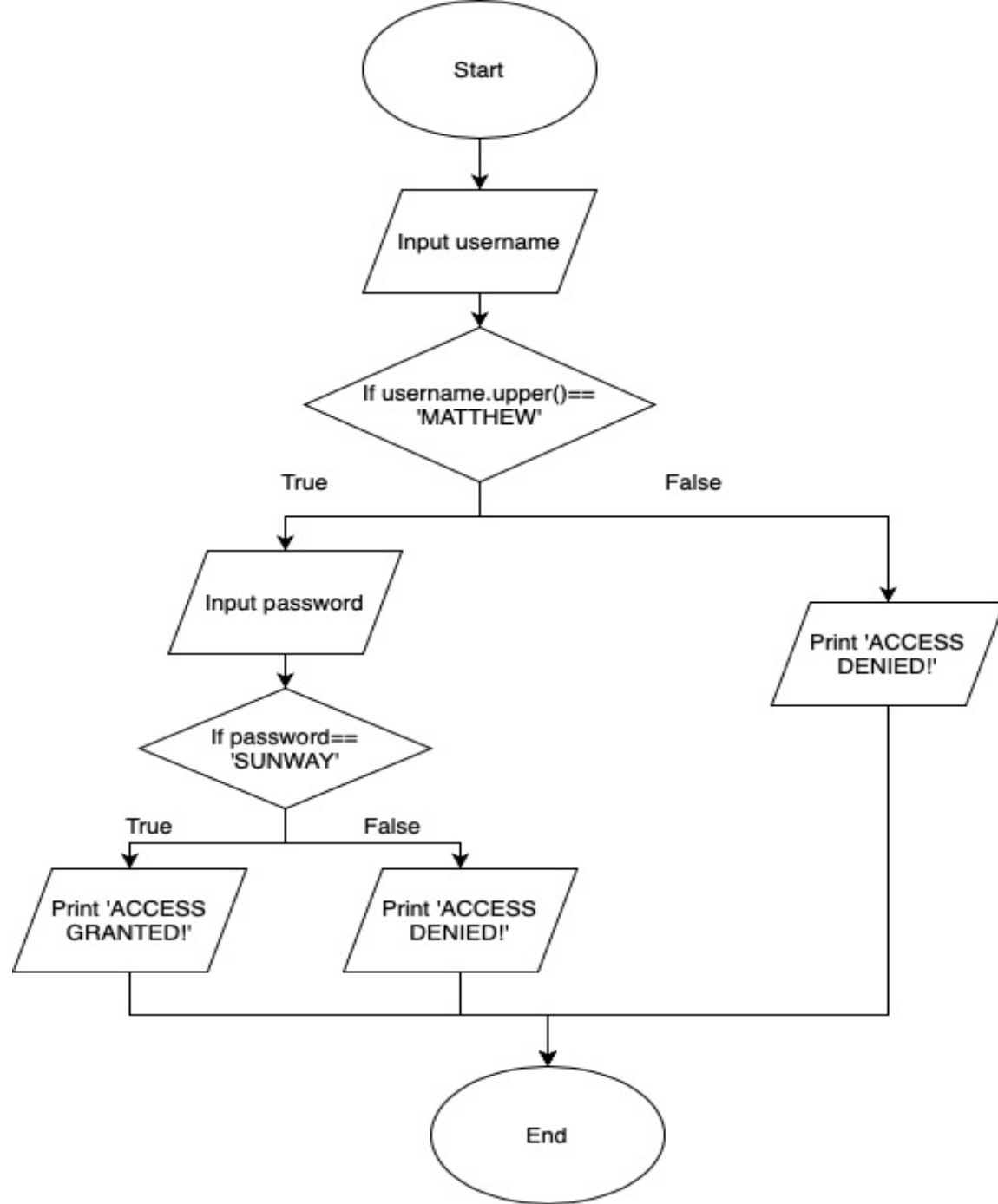If operation == '/'   True   Print num1 + ' / ' + num2 + ' = ' num1 / num2

False

Print 'ERROR! Wrong Selection.'

End

Listing 3 Python program 3

Draw a flowchart for the Python program as shown in Listing 3.

```python
username = input('Enter Username: ')
if username.upper()=='MATTHEW':
    password = input('Enter Password: ')
    if password == 'SUNWAY':
        print('ACCESS GRANTED')
    else:
        print('ACCESS DENIED!')
else:
    print('ACCESS DENIED!')
```

```
Start

Input username

If username.upper()==
'MATTHEW'

True                    False

Input password          Print 'ACCESS
                        DENIED!'

If password==
'SUNWAY'

True        False

Print 'ACCESS   Print 'ACCESS
GRANTED!'       DENIED!'

End
```

```python
username = input('Enter Username: ')
if username.upper()=='MATTHEW':
    password = input('Enter Password: ')
    if password == 'SUNWAY':
        print('ACCESS GRANTED')
    else:
        print('ACCESS DENIED!')
else:
    print('ACCESS DENIED!')
```