1. In mathematics, the Fibonacci numbers, commonly denoted Fn, form a sequence, called the Fibonacci sequence, such that each number is the sum of the two preceding ones, starting from 0 and 1:

$$F_0 = 0, \quad F_1 = 1,$$

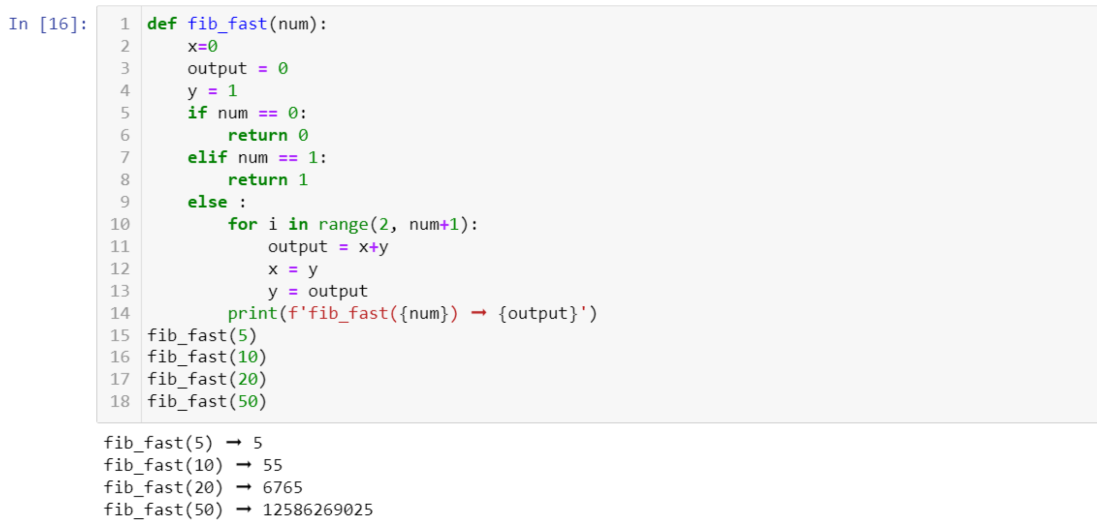
and

$$F_n = F_{n-1} + F_{n-2},$$

for n > 1

The beginning of the sequence is this: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...
The function fastFib(num) returns the fibonacci number Fn, of the given num as an argument.
Examples:
fib_fast(5) ➞ 5
fib_fast(10) ➞ 55
fib_fast(20) ➞ 6765
fib_fast(50) ➞ 12586269025

Ans:



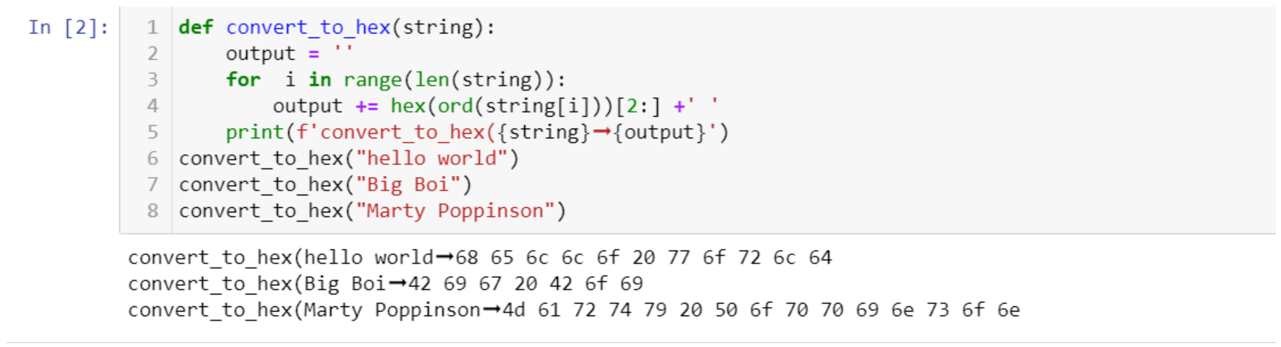
```
In [16]:
def fib_fast(num):
    x=0
    output = 0
    y = 1
    if num == 0:
        return 0
    elif num == 1:
        return 1
    else :
        for i in range(2, num+1):
            output = x+y
            x = y
            y = output
        print(f'fib_fast({num}) ➞ {output}')
fib_fast(5)
fib_fast(10)
fib_fast(20)
fib_fast(50)
```

```
fib_fast(5) ➞ 5
fib_fast(10) ➞ 55
fib_fast(20) ➞ 6765
fib_fast(50) ➞ 12586269025
```

2. Create a function that takes a strings characters as ASCII and returns each characters hexadecimal value as a string.

Examples:
convert_to_hex("hello world") ➞ "68 65 6c 6c 6f 20 77 6f 72 6c 64"
convert_to_hex("Big Boi") ➞ "42 69 67 20 42 6f 69"
convert_to_hex("Marty Poppinson") ➞ "4d 61 72 74 79 20 50 6f 70 70 69 6e 73 6f 6e"

Ans:

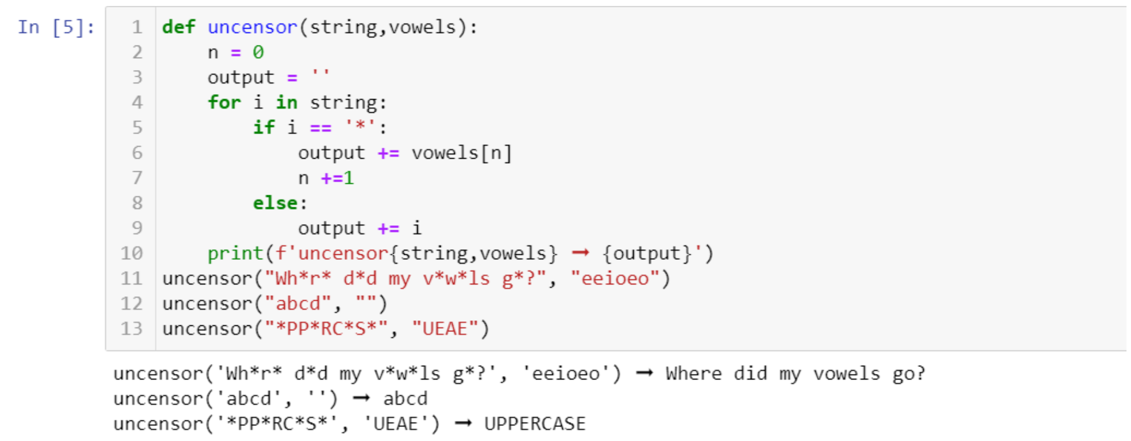


```
In [2]:
def convert_to_hex(string):
    output = ''
    for  i in range(len(string)):
        output += hex(ord(string[i]))[2:] +' '
    print(f'convert_to_hex({string}➞{output}')
convert_to_hex("hello world")
convert_to_hex("Big Boi")
convert_to_hex("Marty Poppinson")
```

```
convert_to_hex(hello world➞68 65 6c 6c 6f 20 77 6f 72 6c 64
convert_to_hex(Big Boi➞42 69 67 20 42 6f 69
convert_to_hex(Marty Poppinson➞4d 61 72 74 79 20 50 6f 70 70 69 6e 73 6f 6e
```

3. Someone has attempted to censor my strings by replacing every vowel with a *, l*k* th*s. Luckily, I've been able to find the vowels that were removed.

Given a censored string and a string of the censored vowels, return the original uncensored string.
Examples:
uncensor("Wh*r* d*d my v*w*ls g*?", "eeioeo") ➞ "Where did my vowels go?"
uncensor("abcd", "") ➞ "abcd"
uncensor("*PP*RC*S*", "UEAE") ➞ "UPPERCASE"
Ans:



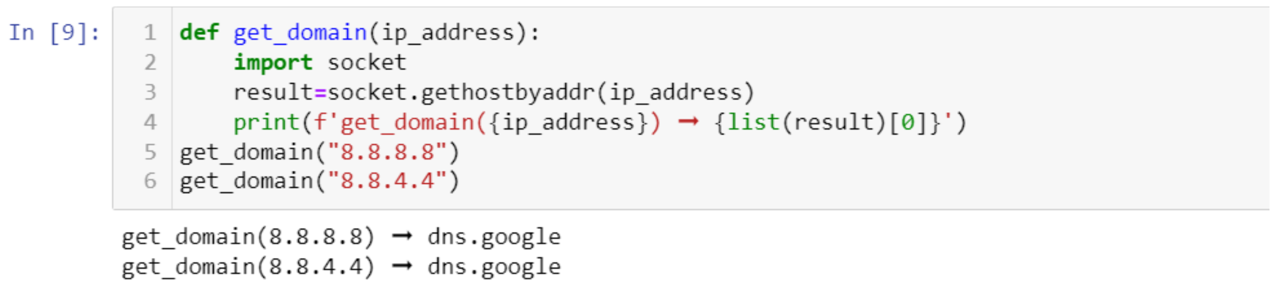
```
In [5]:
def uncensor(string,vowels):
    n = 0
    output = ''
    for i in string:
        if i == '*':
            output += vowels[n]
            n +=1
        else:
            output += i
    print(f'uncensor{string,vowels} ➞ {output}')
uncensor("Wh*r* d*d my v*w*ls g*?", "eeioeo")
uncensor("abcd", "")
uncensor("*PP*RC*S*", "UEAE")
```

```
uncensor('Wh*r* d*d my v*w*ls g*?', 'eeioeo') ➞ Where did my vowels go?
uncensor('abcd', '') ➞ abcd
uncensor('*PP*RC*S*', 'UEAE') ➞ UPPERCASE
```

4. Write a function that takes an IP address and returns the domain name using PTR DNS records.

Examples:
get_domain("8.8.8.8") ➞ "dns.google"
get_domain("8.8.4.4") ➞ "dns.google"

Ans:



```
In [9]:
def get_domain(ip_address):
    import socket
    result=socket.gethostbyaddr(ip_address)
    print(f'get_domain({ip_address}) ➞ {list(result)[0]}')
get_domain("8.8.8.8")
get_domain("8.8.4.4")
```

```
get_domain(8.8.8.8) ➞ dns.google
get_domain(8.8.4.4) ➞ dns.google
```

5. Create a function that takes an integer n and returns the factorial of factorials. See below examples for a better understanding:

Examples:

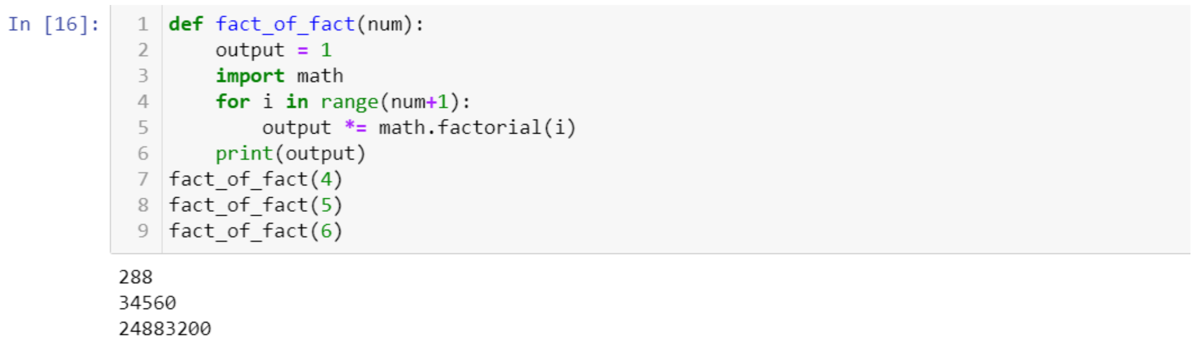
fact_of_fact(4) ➞ 288

# 4! * 3! * 2! * 1! = 288

fact_of_fact(5) ➞ 34560

fact_of_fact(6) ➞ 24883200

Ans:



```
In [16]:
def fact_of_fact(num):
    output = 1
    import math
    for i in range(num+1):
        output *= math.factorial(i)
    print(output)
fact_of_fact(4)
fact_of_fact(5)
fact_of_fact(6)
```

```
288
34560
24883200
```