Sequence

2019년 7월 16일

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In [ ]: #기본수열

In [75]: list = [i**2 for i in range(1,10)] #k^2, k=1,2,3,4,5,6,7,8,9
         list

Out[75]: [1, 4, 9, 16, 25, 36, 49, 64, 81]

In [76]: # list를 더하는 방식
         list = []
         for i in range(1,10):
             list = list + [i**2]
         list

Out[76]: [1, 4, 9, 16, 25, 36, 49, 64, 81]

In [77]: sum(list) #(1/6)n(n+1)(2n+1)

Out[77]: 285

In [ ]: #등차수열

In [78]: list = [2*i+1 for i in range(5)] #2n+1, n=0,1,2,3,4
         list

Out[78]: [1, 3, 5, 7, 9]

In [79]: list = [i for i in range(1,10) if i%2 ==1 ]
         list

Out[79]: [1, 3, 5, 7, 9]
```

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In [80]: list=[i for i in range(1,10,2)]
         list

Out[80]: [1, 3, 5, 7, 9]

In [81]: # list를 더하는 방식
         list = []
         for i in range(1,10,2):
             list = list +[i]
         list

Out[81]: [1, 3, 5, 7, 9]

In [82]: sum(list)

Out[82]: 25

In [ ]: #등비수열

In [83]: list=[5**i for i in range(1,5)] #5^n, n=1,2,3,4
         list

Out[83]: [5, 25, 125, 625]

In [84]: list =[5**(2*i+1) for i in range(5)] #5^(2n+1), n = 0,1,2,3,4
         list

Out[84]: [5, 125, 3125, 78125, 1953125]

In [85]: list = [5**i for i in range(1,10,2)] #2n+1은 등차수열임을 이용
         list

Out[85]: [5, 125, 3125, 78125, 1953125]

In [86]: sum(list)

Out[86]: 2034505

In [ ]: #조화수열

In [87]: list = [(1/(2*i+1)) for i in range(1,10)] #(1/2n+1), n = 1,2,3,4,5,6,7,8,9
         list
```

```
Out[87]: [0.3333333333333333,
          0.2,
          0.14285714285714285,
          0.1111111111111111,
          0.09090909090909091,
          0.07692307692307693,
          0.06666666666666667,
          0.058823529411764705,
          0.05263157894736842]
```

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In [ ]: #피보나치 수열
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In [88]: list = [1,1]
         for i in range(10):
             list = list + [list[i]+list[i+1]]
         list
```

```
Out[88]: [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144]
```

```
In [89]: #수열 생성을 함수로 만들어보자
         def fib(n):
             if n == 1:
                 list=[1]
                 return list

             elif n == 2:
                 list = [1,1]
                 return list

             elif n > 2:
                 list = [1,1]
                 for i in range(n-2):
                     list = list + [list[i]+list[i+1]]
                 return list
```

```
In [90]: flist = fib(10)
         flist
```

```
Out[90]: [1, 1, 2, 3, 5, 8, 13, 21, 34, 55]
```

In [91]:
```
#결과 값만 원하는 경우
def fib_val(n):
    if n == 1:
        return 1
    elif n == 2:
        return 1
    elif n > 2:
        list = [1,1]
        for i in range(n-2):
            list = list + [list[i]+list[i+1]]
        return list[n-1]
```

In [92]:
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fib_val(7)
```

Out[92]: 13

In [93]:
```
#점화식(재귀함수)를 이용한 피보나치 수열, a(n) = a(n-1) + a(n-2), a1 = 1, a2 = 1
def rfib(n):
    if n>2:
        return rfib(n-1) + rfib(n-2)
    else:
        return 1
```

In [94]:
```
rfib(5)
```

Out[94]: 5