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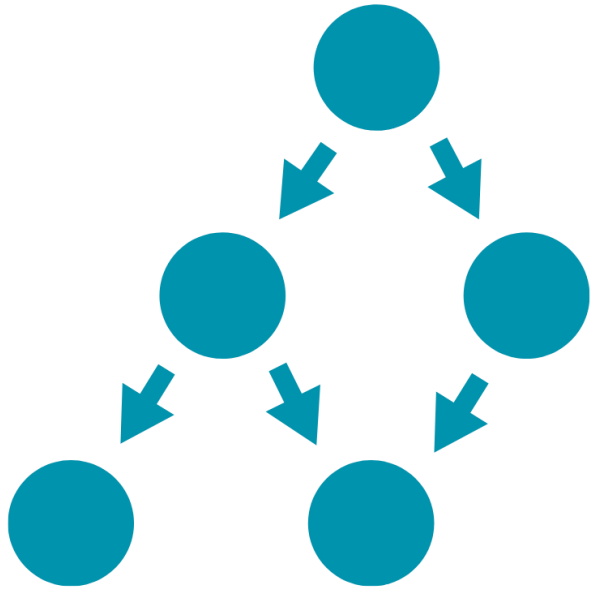
ZAFER CÖMERT
Öğretim Üyesi



VERİ YAPILARILARI VE ALGORİTMALAR

Algorithm Analysis and Asymptotic Notations

Asymptotic Analysis

```
# loops
n = 10
for i in range(0,n):
    print('Current number: ' + str(i))
```

$$Total_{time} = a\ constant\ cx\ n = cn = O(n)$$

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Asymptotic Analysis

```
# nested loops
# outloop executed n times
n = 10
for i in range(0,n):
    print('Current number: ' + str(i))
    for j in range(0,n):
        print('Current number: ' + str(i) + ',' + str(j))
```

$$Total_{time} = c\ x\ n\ x\ n = O(n^2)$$

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Asymptotic Analysis

```python
# Consecutive statements
for i in range(0,n):
    print('Current number: ' + str(i))

for i in range(0,n):
    print('Current number: ' + str(i))

    for j in range(0,n):
        print('Current number: ' + str(i) + ',' + str(j))
```

$$Total_{time} = c_0 + c_1 n + c_2 n^2 = O(n^2)$$

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Asymptotic Analysis

```python
# Logarithmic complexity
def Logarithms(n):
    i=1
    while i<=n:
        i = i*2
        print(i)

Logarithms(100)
```

$$\log(2^k) = logn$$

$$klog2 = logn$$

$$k = n$$

$$Total_{time} = O(logn)$$

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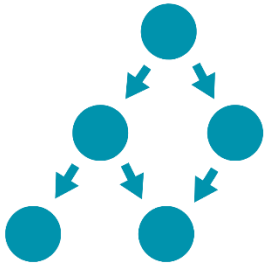

Veri Yapıları ve Algoritmalar

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