PERA Taylor Series using Horner's Rule

$$e^x = 1 + \frac{x}{1} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots + n \text{ times}$$

0 0 $\frac{x \cdot x}{2 \cdot 1}$ $\frac{x \cdot x \cdot x}{3 \cdot 2 \cdot 1}$ $\frac{x \cdot x \cdot x \cdot x}{4 \cdot 3 \cdot 2 \cdot 1}$

2 4 6 8 10

Counting cycle 1

$$2\left[1 + 2 + 3 + 4 + 5 + \cdots\right]$$

$$2\left(\frac{n \cdot (n+1)}{2}\right)$$

$$n(n+1) = O(n^2)$$

$$1 + \frac{x}{1} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots$$

$$1 + \frac{x}{1} + \frac{x \cdot x}{2 \cdot 1} + \frac{x \cdot x \cdot x}{3 \cdot 2} + \frac{x \cdot x \cdot x \cdot x}{4 \cdot 3 \cdot 2}$$

$$1 + \frac{x}{1}\left[1 + \frac{x}{2} + \frac{x \cdot x}{3 \cdot 2} + \frac{x^3}{4 \cdot 3 \cdot 2}\right]$$

$$1 + \frac{x}{1}\left[1 + \frac{x}{2}\left[1 + \frac{x}{3} + \frac{x^2}{4 \cdot 3}\right]\right]$$ $O(n^2)$ quadratic

$$1 + \frac{x}{1}\left[1 + \frac{x}{2}\left[1 + \frac{x}{3}\left[1 + \frac{x}{4}\right]\right]\right]$$ $O(n)$ linear

$$e^x = 1 + \frac{x}{1} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots + n \text{ terim}$$

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$$e^x = 1 + \frac{x}{1}\left[1 + \frac{x}{2}\left[1 + \frac{x}{3}\left[1 + \frac{x}{4}\right]\right]\right]$$

döngü ile

```
int e(int x, int n) {
   int s=1;
   for(; n>0; n--){
      s= 1+(x/n).s;
   };
   return s;
}
```

recursion ile

```
int e(int x, int n){
   int static s=1;
   if(n==0)
      return 1;
   s= 1+(x/n).s;
   return e(x, n-1);
}
```