Project1:

A screenshot of a computer

AI-generated content may be incorrect.

T(n) = T(n // 2) + 1

T(1) = 1

# K = 1

T(n) = T(n // 2) + 1

T(n // 2) = T(n // 4) + 1

# Plug in

T(n) = (T(n // 4) + 1) + 1

T(n) = T(n // 4) + 2

# K = 2

T(n // 4) = T(n // 8) + 1

T(n) = (T(n // 8) + 1) + 2

T(n) = T(n // 8) + 3

# K = 3

T(n // 8) = T(n // 16) + 1

T(n) = (T(n // 16) + 1) + 3

T(n) = T(n // 16) + 4

#I think i see a pattern

T(n) = T(n // 2^k) + k

n // 2^k = 1

2^k = n

k = log2(n)

# Final substitution

T(n) = T(1) + k

T(n) = 1 + log2(n)

O(log n), class logarithmic

Project 2:

A screen shot of a computer

AI-generated content may be incorrect.

T(n)=T(n - 1)+1

T(1)=1

# K = 1

T(n) = T(n - 1) + 1

T(n - 1) = T(n - 2) + 1

# Plug in

T(n) = (T(n - 2) + 1) + 1

T(n) = T(n - 2) + 2

# K = 2

T(n - 2) = T(n - 3) + 1

T(n) = (T(n - 3) + 1) + 2

T(n) = T(n - 3) + 3

# K = 3

T(n - 3) = T(n - 4) + 1

T(n) = (T(n - 4) + 1) + 3

T(n) = T(n - 4) + 4

# Might be a pattern here, who knows

T(n) = T(n - k) + k

n - k = 1

k = n - 1

T(n) = T(1) + (n - 1)

T(n) = 1 + (n - 1)

T(n) = n

O(n), class linear