Project1:


```
PROBLEMS     OUTPUT     DEBUG CONSOL

(base) clarkes@LAPTOP-1W2BCY3:/m
Digits in binary of 256: 9
Digits in binary of 750: 10
```

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:


```
(base) clarkes@LAPTOP-1W2BCY3:/mnt/
Sum of squares up to 12: 650
Sum of squares up to 20: 2870
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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