Analysis of complexity

Group of 3:

The base case is size 50.

Upper ground on and :

Half of the groups contain at least 4 elements *m\**, thus *n*-2

Suppose *n* = 6*k*+*r* (*r*5), then (6*k*+*r*) – 2*k* = 4*k* + *r* = (6*k*+*r*) + *r* *n* +

is integer, so

Using the similar reasoning process, we can get

*T(n)* *T*() + *T*()+*cn*, so *T(n)*=*O*(*n*log*n*)

Group of 5:

The base case is size 50.

Upper ground on and :

Half of the groups contain at least 3 elements *m\**, thus *n*-3

Suppose *n* = 10*k*+*r* (*r*9), then (10*k*+*r*) – 3*k* = 7*k* + *r* = 0.7(10*k*+*r*) + 0.3*r* 0.7*n* + 2.7.

is integer, so (*n*50)

Using the similar reasoning process, we can get (*n*50)

Suppose *T*(*n*) as the time taken by DSelect on set of size *n*

*T(n)* *T*() + *T*()+*n*, when *n* is larger than 50.

Also, *T*(*n*) *n*, for *n*50

Proof that *T*(*n*) *n*, for *n*50

Let *I* = {1, 2, …, 49}

Let *j* *I* be index that maximizes the ratio

Let =, then *i* *I*,

Thus, for *n* < 50, *T*(*n*) *n*

Suppose c = max{,}

Theorem: For *n*0, T(*n*)20*cn* = *O*(*n*)

Proof Basis: for *n* < 50, T(*n*)*cn*20*cn*

Inductive step: To prove that *T*(*n*)20*cn* (if *n*50), assuming that, for all *k* < *n*, *T*(*k*)20*ck*

15*cn* + 4*cn* + *cn* 20*cn*

Group of 7:

The base case is size 50.

Upper ground on and :

Half of the groups contain at least 4 elements *m\**, thus *n*-4

Suppose *n* = 14*k*+*r* (*r*13), then (14*k*+*r*) – 4*k* = 10*k* + *r* = (14*k*+*r*) + *r* *n* + 8.92.

is integer, so (*n*50)

Using the similar reasoning process, we can get (*n*50)

Suppose *T*(*n*) as the time taken by DSelect on set of size *n*

*T(n)* *T*() + *T*()+*n*, when *n* is larger than 50.

Also, *T*(*n*) *n*, for *n*50

Proof that *T*(*n*) *n*, for *n*50

Let *I* = {1, 2, …, 49}

Let *j* *I* be index that maximizes the ratio

Let =, then *i* *I*,

Thus, for *n* < 50, *T*(*n*) *n*

Suppose c = max{,}

Theorem: For *n*0, T(*n*)17.5*cn* = *O*(*n*)

Proof Basis: for *n* < 50, T(*n*)*cn*17.5*cn*

Inductive step: To prove that *T*(*n*)17.5*cn* (if *n*50), assuming that, for all *k* < *n*, *T*(*k*)17.5*ck*

2.5*cn* + 14*cn* + *cn* 17.5*cn*