$$a = 9$$

 $b = 3$
 $\log_a b = \log_3 9 = 2$
 $f(n) = n^3 \log n$

3,
$$n^3 \log n$$
 $n^{2+\epsilon}$ $\epsilon = 1$.

$$\frac{h^3}{3} \cdot \log n_3 < s n^3 \cdot \log n$$

$$\frac{n^3}{3}$$
 (logn - $\frac{3}{3}$.log3) < $8(n^3$.logn).

$$\frac{n^3}{3} \left(\log n \right) - \log 3 \right) \left(\frac{n^3}{3} \log n \right)$$

$$S = \frac{1}{3} \langle 1 \rangle \langle 1$$

C,
$$T(n) = 16 T(n/2) + (n \log n)^4$$
.
 $a = 16$
 $b = 2$
 $\log b = \log_2 16 = 4$.

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$$\int (n) = n^2$$

$$1, f(n) = n^2 < .n^3 - \varepsilon$$

7 T(n) is
$$\Theta(n^3)$$

* Donald Knuth, in his discussion of Shalfs

$$a = 2$$

* Any decreasing gap sequence will work (if the last

* When the gap sequence consists of powers of 2, such as (8, 4, 2, 1) (this was Shell's original method) it can be shown that the worst-case running time is improved when terms of the gap sequence are

logn

* For any version of ShellSon, we do know that its

* Generally speaking, Shallsort's rupning time is