Class $0-4$ vs $5-9$


Tree depth is $\log (n)$ where n is number of classes

At level $i$ we have $2^{\wedge} i$ nodes. If we have $\log (n)$ levels then total nodes are sum_i $2^{\wedge} i$ for $i=0$ to $\log (n)$. The last term in the sum is $2^{\wedge}(\log (n))=n$. If each term is at most $n$ and we sum $\log (n)$ times then total is at $\operatorname{most} \log (n)$. The second to last term is $2^{\wedge}(\log (n)-1)=n / 2$. The total sum is $n+n / 2+n / 4+$ $\ldots+2+1$

