

THERE ARE FEW MINIMAL DESCRIPTIONS

**Recursive Function Theory: Newsletter,
No. 4 (Jan. 1973), p. 14**

We are concerned with the descriptive/definitional/information complexity, i.e. the complexity of something is the number of bits in the program for calculating it whose size is smallest. Thus the complexity of something is the number of bits in a minimal (complete) description. How many different programs for calculating something are of nearly optimal size, i.e. how many minimal or nearly minimal descriptions of something are there?

We give a bound $b(n)$ on the number of programs for calculating a finite binary string which are of size not greater than the complexity of the string $+n$. I.e. a bound $b(n)$ on the number of different descriptions of a particular string which are within n bits of a minimal description. The bound is a function of n , i.e. does not depend on the particular string nor its complexity. The particular $b(n)$ established has the property that $\log_2 b(n)$ is asymptotic to n . An application of this result is given in the announcement "A necessary and sufficient condition for an infinite binary string to be recursive."

[G. J. Chaitin, Mario Bravo 249, Buenos Aires, Argentina]