

## 1 Overview and Introduction

First of all, this exercise involves enumerating **GoogelPlex** and NOT **GooglePlex**. If you don't see the difference, LOOK AGAIN, and perhaps buy some *oculus vas*.

## 2 Preliminaries

A googolplex is the number 10 raised to the power googol. A googol is  $10^{100}$ . Thus:

$$\begin{aligned} 1 \text{ googolplex} &= 10^{\text{googol}} \\ &= 10^{10^{100}} \\ &= 10^{\text{more 1s that fit on this line}} \end{aligned}$$

## 3 The Question

Approximately how much “space” is required to enumerate all of the digits of a googolplex, assuming that each “digit” is rendered as the “average” character in a book, i.e., some non-nifty, over-the-counter font such as Arial, size 10 points?

## 4 Assumptions

Forget about the assumptions. They manifest themselves in the “The Calculation” Section.

## 5 Conclusion

There are required **91.5 years of “parallel” existence** to accommodate enough books to enumerate the number of digits in a googolplex, assuming that the number of lines on pages in books on shelves on bookcases in rooms in buildings on hectares on earths in the Solar System in the Milky Way in 1 Local Group in the Virgo SuperCluster in the Total Universe in 5 seconds of parallel existence in 1 minute of parallel existence in 1 hour of existence in 1 day of parallel existence in 1 week of parallel existence in 1 year of parallel existence in 1 century of existence can accommodate  $164.30 \times 10^{102}$  digits.

## 6 “The Calculation”

Table 1 contains the “calculations” that were performed to attain the conclusion.

## 7 Discussion & References

Forthcoming ...

<b>Approximation</b>	<b>Factor</b>	<b>Num Digits</b>	<b>“Space” Total</b>
Number of “characters” on the “average” single “line” of text	60	60	1 line
Number of “lines” on the “average” page	50	3,000	1 page
Number of pages in an “average” book	200	600,000	1 page
Number of books on an “average” shelf	30	9,000,000	1 shelf
Number of shelves on an “average” bookcase	6	54,000,000	1 bookcase
Number of bookcases in an average “room”	0.003	162,000	1 room
Number of rooms in the “average” building	3	486,000	1 building
Number of buildings on the “average” hectare	0.03	14,580,000	1 hectare
Number of hectares on earth’s land	$1.48^{11}$	$2.16^{18}$	1 earth
Number of Earths in solar system	1	$2.16^{18}$	the solar system
Number of “average” star systems in Milky Way	$1.0^{11}$	$2.16^{27}$	1 “packed” Milky Way
Percentage of stars in Milky Way that are “inhabited”	0.001%	$2.16^{21}$	1 Milky Way
The number of galaxies in Local Group	35	$756.77^{21}$	The Local Group
The number of Groups in Virgo SuperCluster	100	$75.77^{24}$	The Virgo SuperCluster
The number of SuperClusters within the observable universe	100	$7.56^{27}$	The “observable” universe
The number of non-observable “universes” for each “observable” universe	3	$22.70^{27}$	The “complete” universe
Number of complete parallel universes in 5 seconds, assuming that a single universe “splits” into two universes every 1 second.	16	$363.25^{27}$	5 seconds of “parallel existence”
Number of “5 seconds of existence” in 1 minute*	$2^5$	$11.62^{30}$	1 minute of “parallel existence”
Number of “1 minutes of existence” in 1 hour *	$2^{60}$	$13.40^{48}$	1 hour of “parallel existence”
Number of “1 hour of existence” in 1 day*	$2^{24}$	$224.84^{54}$	1 day of “parallel existence”
Number of “1 day of existence” in 1 week*	$2^7$	$28.77^{57}$	1 week of “parallel existence”
Number of “1 week of existence” in 1 year*	$2^{52}$	$129.77^{72}$	1 year of “parallel existence”
Number of “1 year of existence” in 1 century*	$2^{100}$	$164.30^{102}$	1 century of “parallel existence”

Table 1: The “Calculation”, \*assuming a split rate of 1 split per second.