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Homework 2

Writing Assignment 1 Reflection

1. I found the non-technical explanation easier to write, because I felt less compelled to cover technical details of the definition. I felt it necessary to give the technical audience some explanation of how mathematicians consider manifolds and how manifolds depend on not only their own structure but also the structure of the space into which they are embedded (extrinsic dimension). A mathematician's definition of a manifold might be:

   **Definition:** If $n, k \in \mathbb{N}$ with $k \leq n$, $M \subseteq \mathbb{R}^n$ is a $k$-**manifold** iff, $\forall x \in M$, $\exists$ open sets $U_x \subseteq \mathbb{R}^n$ (with $x \in U_x$) and $V_x \subseteq \mathbb{R}^k$ and a continuous bijection $f_x : V_x \to M \cap U_x$ with $f_x^{-1}$ continuous.

   A technical reader has some exposure to mathematical notation, and might have seen some rigorous mathematical definitions. Thus, I struggled for quite a while with how much of the true definition to include.

   For the non-technical audience, it seemed sufficent to explain manifolds visually, without referencing their mathematical context, because a more thorough explanation would have to be unreasonably long.

2. The results claim that both my definitions 'should be easily understood by' 15 to 16 year olds, suggesting that both definitions were written at an appropriate level in terms of word complexity and sentence length. This isn't too surprising, since most of my definitions are visual in nature, and describe simple images. I think the primary difficulty in understanding my definitions is in generalizing the examples and in understanding (especially for the technical definition) how and why manifolds in general serve as interesting mathematical objects. I think, therefore, that I may have oversimplified the technical definition, at the cost of making the definition less interesting and useful. It does surprise me slightly that the readability statistics are so similar for the two definitions, since I had thought that I had been using slightly more complex vocabulary for the technical definition (I suppose this is reflected in the 5% difference in the percentages of complex words).

Readability statistics are tabulated on the next page.

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| Non-technical Audience | | Technical Audience | |
|---|---|---|---|
| Flesch Kincaid Reading Ease | 69.3 | Flesch Kincaid Reading Ease | 65.1 |
| Flesch Kincaid Grade Level | 8.1 | Flesch Kincaid Grade Level | 9 |
| Gunning Fog Score | 11.9 | Gunning Fog Score | 14.3 |
| SMOG Index | 8.6 | SMOG Index | 10.3 |
| Coleman Liau Index | 9 | Coleman Liau Index | 9.4 |
| Automated Readability Index | 7.5 | Automated Readability Index | 8.4 |
| No. of sentences | 12 | No. of sentences | 23 |
| No. of words | 219 | No. of words | 443 |
| No. of complex words | 26 | No. of complex words | 73 |
| Percent of complex words | 11.87% | Percent of complex words | 16.48% |
| Average words per sentence | 18.25 | Average words per sentence | 19.26 |
| Average syllables per word | 1.41 | Average syllables per word | 1.44 |