Laboratory Report #1 — My First Lab Report

Thomas Gregor

Collaborators: Joshua Shaevitz, Peter Andolfatto

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Introductory Questions

1. **You usually have to answer introdcutory questions this is a nice way to lay that out.**

   Woah, this is so nice! Here is an equation

   $$\int_a^b f(x)\,\mathrm{d}x = F(a) - F(b) \tag{1}$$

2. **Is it true that they are numbered automatically?**

   It appears so! I thought Eq. (1) was so interesting and fun I want to talk about it again over here.

Introduction

Focus Sentence: We attempt to measure the length of the flagella of *E. Coli* using only a ruler, a microscope, and tweezers.

We used five strains of *E. coli* whose characteristics are summarized in Table 1: some have flagella that we can measure, but some are also too unfriendly to aproach safely.

Strain #	Has Flagella	Is Friendly
1	no	no
2	yes	**no**
3	no	yes
4	yes	yes

Table 1: Summary of Strains

We also have some beautiful figures such as Fig. 1, of which Fig. 1a is clearly the best.

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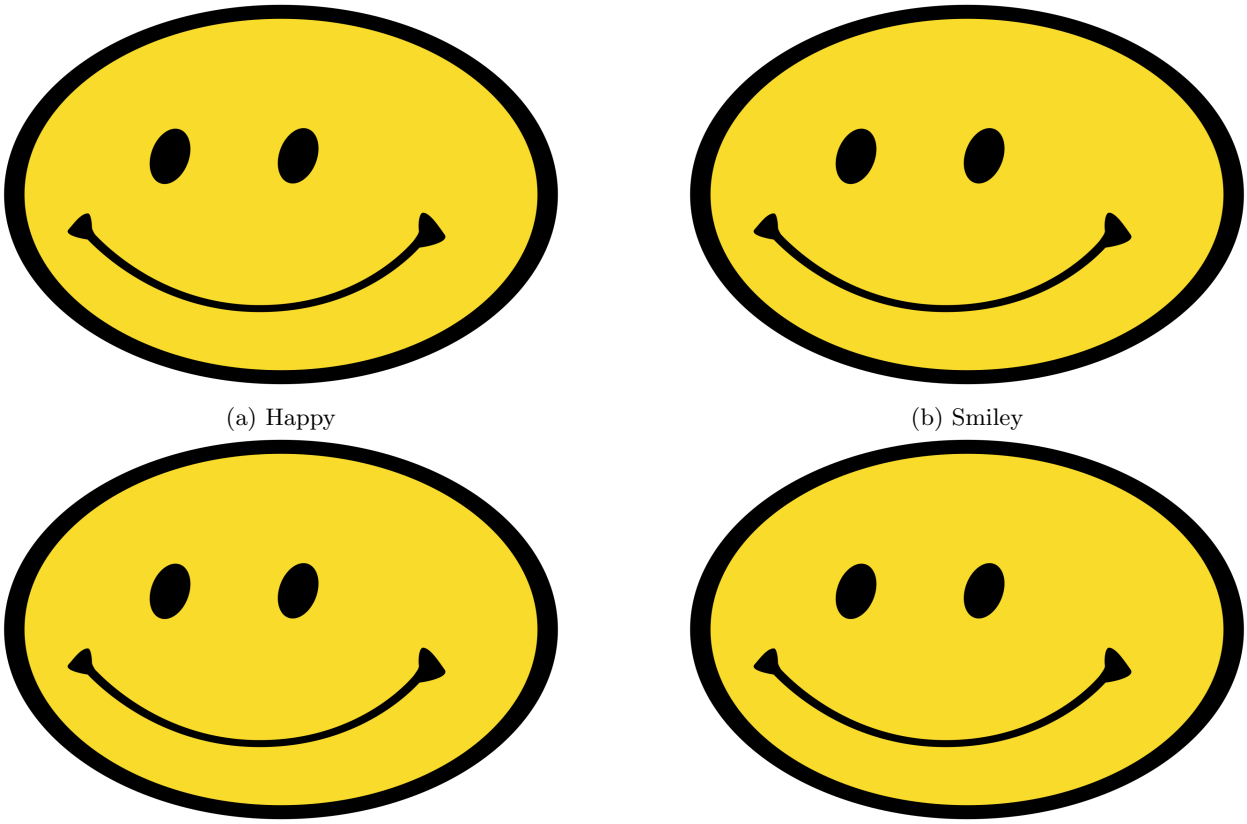

(a) Happy

(b) Smiley

(c) Yellow

(d) Cheerful

Figure 1: Here are four figures in a square pattern.

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Figure 2: Here is a figure all by itself.

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Concluding Questions

1. **Describe some other things that we can do here with math.**

   (a) Easy differentials with nice spacing!

$$\mathrm{d}m = \lambda\,\mathrm{d}x \tag{2}$$

$$\frac{\mathrm{d}m}{\mathrm{d}x} = \lambda \tag{3}$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\Big[V\ell^2\Big] = \lambda \tag{4}$$

   (b) Nice brackets and parentheses that resize!

$$\left(\frac{1}{1+x}\right)^2 = \left[1 + x + x^2 + x^3 + \cdots + x^n\right]^2 \tag{5}$$

(c) We've got all sorts of vectors!

$$\mathrm{d}\vec{\boldsymbol{x}} = \vec{\mathbf{a}} \cdot \vec{\boldsymbol{a}} \cdot \mathbf{b} \times \boldsymbol{b} \times \hat{\mathbf{u}} \times \hat{\boldsymbol{u}} \tag{6}$$

(d) We've got partials!

$$\frac{\partial y}{\partial x} \tag{7}$$

For more information see http://mirrors.ibiblio.org/CTAN/macros/latex/contrib/physics/physics.pdf.

2. **What else can we do?**

   For chemistry, we can say that there $\mathrm{O_2} + 2\,\mathrm{H_2} \longrightarrow 2\,\mathrm{H_2O}$, or that $[\mathrm{H_2O}] = 100\,\mu\mathrm{M}$ is increasing.

   We can also make differential equations:

$$\frac{\mathrm{d}[\mathrm{A}]}{\mathrm{d}t} = -k[\mathrm{A}] \tag{8}$$

   For units, we can say that magnetic fields are measured in T, $1\,\mathrm{N} = 1\,\mathrm{kg\,m/s^2}$, and that the speed of light is $3 \times 10^9\,\mathrm{m/s}$, and that human speeds are usually 0–30 m/s.

Acknowledgments

This paper represents my own work in accordance with University regulations – /s/ Jake Waksbaum

MATLAB Code

```
function err = simple(exp, actual)
%PERCENTER Calculates the percent error
err = (exp - actual) ./ actual;
end
```