**Octave Publishing Project**

*Show Your Calculus/Octave Skills Using Markup*

Summary: In lieu of an Octave portion on the day of the Unit 14b exam, you will use Octave Markup to publish a document showcasing your Calculus, communication, and Octave skills.

Topics:

First pick 2 topics from Advanced Calculus so far. They must be from different chapters. All topics must be approved by Mr. Malan. No more than 2 students may work on any given topic. Once you have your topics, draft out what to write/calculate about each. See specific instructions below.

Structure:

Your document will consist of 3 main sections, but these sections will be broken up between prose, code, and figures. Your “audience” is not Mr. Malan, but rather an imaginary hiring committee or university admission interview panel. They say, **“Wow, you took Multivariable? What did you learn about? You have 5 minutes to impress us.”**

1. Intro – Explain what you are learning this year and how Octave relates to it.
2. Topic 1 –
   1. Discuss your topic in a paragraph or two. What type of question does it help us answer? When can we use it? Be sure to include how *CALCULUS* is used.   
      For math notation (in this section or anywhere else), you have only 2 options for how to type it in: (i) write it however it would be typed into a TI-84: -3e^(x+1)/sqrt(x+y) or (ii) use LaTeX.
   2. Introduce a problem/question. Create your own or cite your source.
   3. Use Octave to numerically calculate an answer. 🡨 required for   
      You might want to switch back to prose to explain/interpret the answer.
   4. Include a relevant visual. If it is not 100% self-explanatory, then include some prose to help the reader interpret it.
3. Topic 2 –   
   Same structure as Topic 1

For each topic, the goal is to show that you:

* grasp the topic at a conceptual level.
* can articulate your knowledge of the topic in your own words. (Mr. Malan will check for plagiarism.)
* can use Octave to ***calculate*** something related to the topic.
* can use Octave to ***draw*** something related to the calculation.

In addition to these basic communication skills, you must show your ability to use certain Octave skills throughout your document. See rubric.

After you have drafted your document, it is time to start a script. See Mr. Malan’s Markup Guide on the Advanced Calculus Octave page on Canvas for help getting started.

If you have trouble with your laptop’s Octave software, octave-online.net can also publish your document. It can even publish to PDF, which would normally require you to have a LaTeX interpreter installed. If you would like to try it, do the following:

* Sign in. (You will need an account)
* Create a script, for example: practice\_pub.m (The .m part will not be automatic. You must intentionally include it.)
* Paste in the code from the Ch14 guide. Hit Save.
* In the command line, type: publish('practice\_pub.m') 🡨 use single or double quotes
* Refresh the page. On the left you should see an HTML file. Download it and open it in your browser.
* If you want a pdf, type, publish('practic\_pub.m', 'pdf') and just be willing to wait a while.

Rubric:

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | | **Earned** | **Possible** |
| Intro |  |  | 1 |
| Topic 1 | Verbal explanation |  | 2 |
| Problem intro + computation |  | 3 |
| Visual – useful and visually appealing |  | 2 |
| Topic 2 | Verbal explanation |  | 2 |
| Problem intro + computation |  | 3 |
| Visual – useful and visually appealing |  | 2 |
| Required Octave Skills  (One use of each. Anywhere in the document.) | Create an expression/equation in LaTeX |  | 0.5 |
| Define an anonymous function |  | 0.5 |
| Specify domain/axes in an image |  | 0.5 |
| Numerical calculation |  | 0.5 |
| Use subplot to juxtapose 2+ related images |  | 0.5 |
| Use the “view” command |  | 0.5 |
| Bullet list (other than table of contents) or numbered list |  | 0.5 |
| Fully MATLAB compatible. |  | 0.5 |
| Other | Readability (spelling/grammar/transitions) |  | 1 |
| Deductions |  | 0 |
|  |  |  |  |
|  | **Total** |  | **20** |

Some examples of how “subplot” could be used:

* 2 different views of the same VVF, if one view angle is not enough
* A function and its contour plot
* A function and its gradient field
* One surface, then another, then show how they intersect
* Illustrate and then on the same surface
* Show the saddle point on a graph and then view it from another angle to show a local max

There are *MANY* more possibilities.