

Getting to Know L^AT_EX

For this course, you will be creating documents for each homework assignment that must be nicely typeset. L^AT_EX is an awesome tool to do this!

This mini-homework is meant to get you used to working in L^AT_EX. Thus, the use of L^AT_EX is compulsory for this assignment, but we emphasize that this is a one-time thing. In other assignments you do not need to use L^AT_EX, even though strongly recommend that do so. Future assignments will have points based on clarity and presentation. L^AT_EX will help you in getting those points.

Note: Assignments in the course must be typeset (L^AT_EX is recommended, but in future assignments you can use other software if you so desire). Regardless of the program you decide to use, you can add hand drawn pictures (just take a picture and somehow add to the document). You can handwrite explanation in the figure, but as a rough guideline: anything that is longer than 1 line/sentence should be typeset.

Getting Started:

You will first need to download/install L^AT_EX and, if you prefer, a L^AT_EX environment. [This](#) is a great place to start. [Here](#) is another great guide. Follow the instructions for your particular operating system. Alternatively, you can use an online L^AT_EX editor such as [Overleaf](#).

Next Steps

Congrats! You now have an installation of L^AT_EX. Download the template file and open it in your Tex editor of choice. Notice that the header doesn't quite match you and your course information. Change the subjnum and subjname to match this course. Change the items in the "doheading" block to reflect the homework number. Use your name instead of "Sally Student". Compile the tex file and check that your header now looks something like this document or example.pdf.

You now have a template that you can use for any of your assignments in this course!

Guidelines

On to the actual assignment! For ease of grading we ask you the following format:

- Start each of your answers with the `\section` command. You will see that the template we gave you already redefined sections to say *Question* instead of *Section* (fun question, can you find the command line that does that?).
- Try to keep each answer to one page. We design questions so that the answer should fit in a page. It is ok to go beyond that limit (specifically if you want to add several images), but consider shortening your answer if it starts to get too long
- Gentle reminder that in Comp 160 we care more about the *why* than the *what*. Make sure to reason every step in your reasoning process.
- End each question with the `\pagebreak` command (it will leave the rest of the page blank so that each question is answered in a different page).

Question 1: Self introduction

In this exercise we will practice the basics of L^AT_EX. Often questions will have sub-questions. Before answering each subquestion add the `\subsection{Subquestion Title}` command.

Question 1.1: Photo

Add a picture of yourself and a quick description of the image.

You will need to look up the `\includegraphics` command. Center the photo using the `\begin{center}` command. Remember that all begin commands must be closed with an end command. Compile your tex file to make sure that the photo appears as it should. You can scale the photo as necessary with options in the `\includegraphics` command. Make sure to add a caption to the image. The caption of the image can be added with the `\caption` command (if the image is encapsulated within an `\figure` environment), or simply by writing text under the image, your choice.

Note: We would appreciate if you use a recent picture. That image will be used to link faces and names. You can simply use the image from your Tufts SIS, but we prefer if you use a fun picture that matches your personality!

Question 1.2: Hobbies

Create a list using the `\begin{enumerate}` command. Each item should be one of your favorite hobbies. Compile the tex file to make sure that the list appears as it should. This is the end of Question 1. Remember to end `\pagebreak` command so questions are answered in different sheets. Similar to good coding policies, it is nice if you can visually separate the text. You can do this by typing a sequence of % (The percentage symbol is similar to // in C++).

Question 2: Previous Knowledge

Go the course's webpage (<http://www.cs.tufts.edu/comp/160/>) and read it, specially the 1-page summary syllabus. You will see that the contents of the course are split into three blocks.

Question 2.1: Known Topics

Make an `\begin{description}` environment listing all the algorithms or techniques mentioned that you studied in previous courses. Give a 1 sentence description of each of them.

Question 2.2: Familiar Topics

Make an `\begin{itemize}` environment listing all the algorithms or techniques mentioned that you have heard of (just in name, no need to be familiar with). You can omit those listed in the previous question.

Question 2.3: Unknown Topics

Look at other topics (those that you did not mention in the previous two questions). Is there any in particular that you look forward to learning? Which one and why?

Question 3: Proof Practice

Now it is time to practice Theorem and proof statements. In lecture we talked about the following problem: *Design an algorithm that, given an array A of n real numbers, computes the largest value that can be obtained by multiplying all but one entry of A . You cannot use an entry more than once. Also, your algorithm is not allowed to use the division operator (explicitly or implicitly).*

In lectures we gave a Lemma that can be used as a stepping stone to solve the problem.

1. State it (using a `\begin{lemma}` command) and then add a proof (you can start the proof with a `\begin{proof}`). Do not forget the matching `\end{lemma}` and `\end{proof}` statements.

Hint: although the spirit of the Lemma given in lecture is on the right track, it fails on some cases. Try to find them and modify the Lemma so that it always works (Ask yourself, what happens with number zero? if all values are positive? negative? does the Lemma work when numbers are repeated? something else missing?).

2. Finish the assignment by fully answering the question. As in, describe how to make an algorithm that solves the question. We encourage you to take a look at the *How to write proofs* document for ideas on how to structure your result. In Comp 160 each time you describe an algorithm you should always justify correctness and analyze runtime. This will be quite easy for this assignment, but make sure to write 1-2 sentences discussing those points (in this and future assignments).

Note: this problem does not need any Comp 160 knowledge (it is mainly designed as a \LaTeX practice exercise). Since it is a no pressure exercise, it provides us with the perfect opportunity to discuss academic integrity. We strongly encourage you to use the sandwich approach to this exercise (and any other assignment): first read the problem and think of it on your own. What are the key points that must be done? What do you think is the solution? If you get stuck you can freely discuss with fellow students, ask TAs, scour the internet for help, and use any means you can consider for help.

Once you have fully understood the solution, go back to working on your own. It is important that you write the answer **in your own words**. Also,

do not forget to list **every person** that helped you do the exercise. This includes TAs (it is easy for submissions to be similar if they got help from the same TA. Knowing who you got help from makes it very easy for us to discard any similarity). Follow these simple steps and we will be super glad to never again talk about academic integrity.

Question 4: (Optional) Fun Challenges

This question is purely optional. It will not be worth any credit, but it is great for procrastinating (do this fun exercise instead of something more important).

Here are you have a few fun L^AT_EX challenges for you to practice:

Question 4.1: Formula

Write a mathematical formula that includes the following: a square root symbol, a capital and lowercase greek letter, a fraction, and an exponent.

Question 4.2: Table

Create a table with your daily schedule (hint: look at the `\begin{tabular}` command).

Question 4.3: Figure

Draw some figure. Make a graph, or any other two dimensional image you like. Look up the `tikz` package if you need inspiration.

Question 4.4: Command

Use a cool L^AT_EX command and describe what it does.
(Look up the "simpsons" commands as a starting point)

Question 5: Logistics

This semester is a bit unusual, so we hope you do not mind us asking a few personal questions

1. How are you doing personally? Do you feel ready to start the course?
2. Do you have access to all of our tools (Canvas/Piazza/Gradescope/SoCoCo)?
3. Do you have a good environment to focus on learning? Can we do anything to help? Do you know that Tufts has laptops and other equipment to share with students?
4. Would you be interested in in-person recitation and/or office hours? If so, which of the three recitation slots would work best for you? Note that this will not impact the support we give to students doing remote learning
5. Depending on which course you are enrolled (Comp 160 or CSO 160) answer the questions below (you can verify which course you are by looking at SIS)

Comp 160 Exams will be synchronous (dates are listed in the course's website). Please mark the dates down in your calendars. Will you be able to attend them? If you have a conflict with any of them reach out to the instructors explaining your situation this week.

CSO 160 If you are enrolled in CSO 160 you need to use proctorU to schedule exam dates. Please schedule the three dates this week. Did you have any trouble scheduling them?

All students Do you have any accommodations arranged with SAS (or are in talks) that we should know? If so, please e-mail both instructors with the details.

Note: Keep in mind that anything you answer will be visible by all TAs of the course. Future questions will not ask anything personal, so this should not be an issue. Just keep in mind that if you want to share something only with instructors (and not with TAs), e-mailing the instructors will be a better way to do so.