

MAD 3105 - Distance Learning Introductory Assignment

This assignment is to help you learn to write some of the symbols and draw some graphs, save the material as a pdf file, and submit them electronically using the course drop box. There is no "math" to do on this assignment. You should copy page 5 of this assignment word for word (or perhaps symbol for symbol would be more appropriate). Save your assignment in a pdf file using the following naming convention: If your username is abcd05z, then you would name this file A0_abcd05z.pdf. Then turn the pdf file using the Assignments button on the course BlackBoard site. This assignment is worth 10 points.

Your mentor may return this assignment to you with adjustments and/or corrections that need to be done, along with a due date for a resubmission. To receive credit for this assignment, you must turn in any revisions requested by your mentor. There will be no partial credit on this assignment, it will be graded all or nothing. Most later assignments will receive partial credit.

You may use any of the methods outlined below to write up this assignment or, if you find another method that works well for you, you may use it as long as it satisfies the following conditions.

The following must be satisfied for this assignment to be accepted.

- Your assignment must be a pdf file. All assignments submitted for this course should be in pdf format. Exceptions may be granted on limited assignments, but all exceptions *must* be cleared through your mentor *before* the assignment's due date. An example of when an assignment may be turned in another format, such as a fax, is if your hard drive crashes and you will not be able to get your computer and programs up and running before a due date.
- Second and very important, your assignment must be accessible and legible to your mentor. Your mentor will have the final word about whether or not they could download and read your assignment. Your mentor will give you guidelines based on the equipment available to them. For example, you may need to limit the size of your files (assignments may be broken into several files), they may or may not be capable of accepting a fax directly.
- Your notation and graphs must conform to the notation and graphs used in our course. Please do not create your own notation for symbols! Sometimes there are standard alternatives for notation used in the text and these alternatives are often described in the online lecture notes. If you are typing your assignments and cannot create the appropriate symbol please ask your mentor for an alternative notation or look up the TeX command for the symbol (see below for discussion of TeX commands).

Here are some suggestions for writing this assignment and future assignments:

1. Perhaps the easiest method of creating the necessary files, is to use a scanner to scan hand written assignments and then convert to a pdf file. There are scanners on the market that can save your files as pdf file directly, so you would not need any additional software. I have seen these scanners on sale for just under \$100 in the paper. If you already have a scanner or plan to get one of the very inexpensive scanners there are other methods of creating the pdf file which are outlined below.

If you use a scanner, **use plain white paper** and pen with dark ink. Do NOT use notebook paper or light colored pens. Do NOT scan papers with eraser marks. Please **clearly cross out errors, rather than erasing** if you use a scanner.

2. You may prefer to type your assignments using one of the many available word processing programs. This is a good idea if you have poor handwriting!

You can use the symbols packaged with the programs such as Word or use \LaTeX commands as a substitute for the symbols (discussion of \LaTeX is below). Graphs may be created using a variety of programs as well. Among these are the graphing tool in Word, Powerpoint, Photoshop, etc. Once you have created the file, you will need to convert the file to a pdf file.

3. Graphing programs, such as Photoshop, can be used to “hand draw” symbols and graphs and insert text. A tablet is convenient to use when doing this and the Wacom Tablet is packaged with Adobe Photoshop, which saves files as pdf files. The easiest method I have found when using Photoshop is to write the text in Word, insert in a text box in Photoshop, and “hand write” the material with graphs or symbols. Then save the file as a pdf file.

Creating a pdf file

1. If you use a scanner that saves as pdf files or a program that saves as pdf files, you don't need any more than that. It is convenient to have your own software/hardware that will save files in pdf format so you will not have to rely on servers being up and your computer being online when you save your files in pdf format.
2. Go to www.pdf995.com - the application installs on your machine as a printer driver. When you print to it from practically any application (such as MS Word), it converts it to pdf and prompts you with a "save as" pop-up.
3. You may purchase Adobe Acrobat. The University Bookstore sells the program to students at the education price. Adobe Acrobat converts files from Word, gifs, jpegs, and more into pdf format. You may also do limited editing/annotation to pdf files using Adobe Acrobat.

4. You may save your files as text files and go to
<http://www.sanface.com/createpdf.html>.

Cut and past your text files into here to turn them into pdf files for free. I cannot guarantee this site will maintain its availability and assignments may not be turned in late because this site was not running.

5. Save your files as image files like jpegs, gifs, png, etc. and go to
www.iconv.com.

You can convert these files to pdf files for free at this site. I cannot guarantee this site will maintain its availability and assignments may not be turned in late because this site was not running.

6. If you can save your files as eps, ps, or gif you can ftp them to your cs department computer account and distill these formats to pdf format. If you plan to use this method, contact me for more information and to work on any arrangements necessary to use the cs department accounts for this.
7. If you want to learn to write \LaTeX files, you can ftp the files to the cs department and change them to pdf files using Unix commands. There are also \LaTeX compiling programs available for MACs and PCs. I use TeXShop which creates a pdf file automatically when the file is compiled. If you wish to learn \LaTeX in all its glory please contact me for additional information. The information below about \LaTeX commands is not instructions for creating a real \LaTeX file. It is simply a way you may write symbols using plain text that will be understood by your instructors.

Using \LaTeX Commands

There are type setting programs used to produce documents in mathematics, computer science, and many other sciences called \TeX and \LaTeX . These documents are written in plain text using special commands for the mathematical symbols. These text files are similar to a program file that is then compiled. This assignment was written using this program. The point is, symbols are represented using plain text commands. You may use these plain text commands to represent symbols in your assignments. I personally prefer this method to using the Word symbols because it requires no clicking and dragging and no setting up of short-cut keys. The last page of this assignment has a list of \LaTeX commands for most of the symbols you will use this semester. There will be an online list of these commands as well that will be updated as necessary. Note: you do NOT have to learn to write complete \LaTeX files and compile them. You may simply substitute a \LaTeX command for any symbol you wish to represent and your mentor and I will read it as though the symbol were used. Also, you are NOT required to use \LaTeX commands. You may scan a handwritten assignment or use symbols in word processing programs instead.

Here is an example of how you may use \LaTeX commands to write a mathematics statement. The following is a logical statement that you would be expected to be able to write in your homework:

$$\forall x \exists y \forall z (B(x, y) \wedge ((z \neq y) \rightarrow \neg B(x, z)))$$

Using L^AT_EX commands, this statement may be written

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\forall x \exists y \forall z (B(x,y) \land ((z \not= y) \to \lnot B(x,y)))
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Notice the latter statement can be written and saved as a text file.

You may use the L^AT_EX commands in place of mathematics symbols in all your assignments. While it is possible to do all of this assignment (charts and graphs) and more with L^AT_EX, graphs and tables require more complex commands and I recommend using other methods for these. I should also note that when really writing a L^AT_EX document all math commands would be written in between dollar signs. We will ignore this rule for our assignments.

Start this assignment now and turn it in. You will need to have any problems producing assignments straightened out as soon as possible.

1. Reproduce the following expressions. The upper and lower bounds of the intersections and union may be written just to the upper and lower right of the intersection and union symbols (like $\cap_{j=1}^n$).

(a)

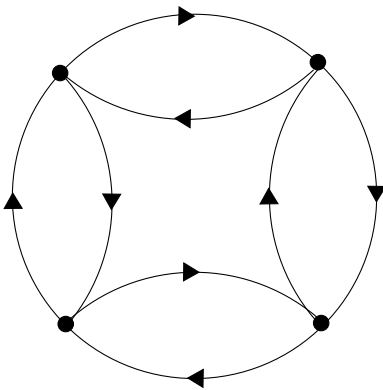
$$R^* = \bigcup_{n=1}^{\infty} R^n$$

(b)

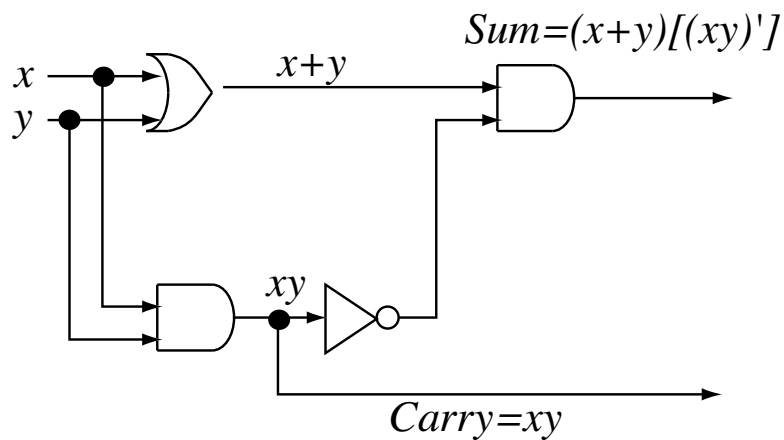
$$M_{R^*} = \odot_{n=1}^{\infty} M_{R^n}$$

2. Reproduce the following figures. You may use line segments rather than curves or visa versa, but the vertices (points) must be clear, there should not be any extra vertices, and the direction on each edge needs to be given. Labels that are given for edges must be given.

(a)



(b)



TeX Commands

$x^n = x^{\wedge}n$	$\infty = \backslash\infty$	$\sum_{n=0}^n = \backslash\sum_{n=0}^n$
$x \in A = x \backslash\text{in } A$	$x \notin A = x \backslash\text{not}\backslash\text{in } A$	$\subset = \backslash\text{subset}$
$\subseteq = \backslash\text{subsepeq}$	$\supset = \backslash\text{supset}$	$\supseteq = \backslash\text{supseteq}$
$\cup = \backslash\text{cup}$	$\cap = \backslash\text{cap}$	$\oplus = \backslash\text{oplus}$
$\otimes = \backslash\text{otimes}$	$\leq = \backslash\text{leq}$	$\geq = \backslash\text{geq}$
$\equiv = \backslash\text{equiv}$	$\approx = \backslash\text{approx}$	
$\rightarrow = \backslash\text{to}$	$\leftarrow = \backslash\text{gets}$	$\leftrightarrow = \backslash\text{leftrightarrow}$
$\Leftarrow = \backslash\text{Leftarrow}$	$\Rightarrow = \backslash\text{Rightarrow}$	$\Leftrightarrow = \backslash\text{Leftrightarrow}$
$\wedge = \backslash\text{land}$	$\vee = \backslash\text{lor}$	$\neg = \backslash\text{lnot}$
$\lfloor = \backslash\text{floor}$	$\lceil = \backslash\text{lceil}$	$\rfloor = \backslash\text{rfloor}$
$\lceil = \backslash\text{rceil}$		
$\emptyset = \backslash\text{empty}$	$\overline{A \cup B} = \backslash\text{overline}\{A \backslash\text{cup} B\}$	
$\forall = \backslash\text{forall}$	$\exists = \backslash\text{exists}$	$\downarrow = \backslash\text{downarrow}$
$\neq = \backslash\text{not}=\$	$\pm = \backslash\text{pm}$	$\sqrt{x+1} = \backslash\text{sqrt}\{x+1\}$
$\not\equiv = \backslash\text{not}\backslash\text{equiv}$	$\odot = \backslash\text{odot}$	$\times = \backslash\text{times}$
$\not\leq = \backslash\text{not}\leq$	$\preceq = \backslash\text{preceq}$	$\prec = \backslash\text{prec}$
$\uparrow = \backslash\text{uparrow}$		

$$\overline{\overline{x} + \overline{y}} = \backslash\text{overline}\{\backslash\text{overline}\{x\} + \backslash\text{overline}\{y\}\}$$

Notice that $\frac{1}{x+1}$ should be written $1/(x+1)$. If you write $1/x+1$, this is equal to $\frac{1}{x}+1$.