# Presentations On Algorithms

## About The Presentations

Each person in this class will be required to make 2 presentations on some topic that is listed in the syllabus. The presentations should cover the fundamental, technical ideas underlying each topic. While you are not required to cover every single aspect of your topic, you should include enough detail to allow someone to then make sense of all the rest of the subject.

Each presentation will last twenty minutes, and should include such supplementary material such as PowerPoint slides, source code, printed handouts, websites, and diagrams drawn on the whiteboard. While you are encouraged to incorporate interesting materials (such as websites), the presentation itself must be your own, original work. Further, the primary goal is to convey a technical understanding of the material; if you yourself don't have this understanding, you won't be able to convey this understanding to others.

For face to face (F2F) classes: you may use the computer/projector present in the ePodium, and arrange for materials from the Campus Media Center (CMC). If you want to hook up your laptop to the ePodium (to project the screen onto the whiteboard) you'll have to contact the instructor ahead of time in order to arrange for an appropriate cable. While the instructor can't guarantee that the correct cable (etc) will be available, requesting this at least 2 days ahead of time will greatly help in finding necessary supplies.

For online classes: There’s material on the Canvas website that provides options for technologies to use for putting together a presentation without having both presenters in the same physical space.

**The presentations will be done in pairs (or more rarely, individually)**, with each pair making a total of two presentations throughout the quarter. Each person will make a roughly equal contribution to each presentation, and both people should be equally well-versed in the topic; each person should be capable of fielding questions, explaining topics, etc, etc.

For face to face (F2F) classes: In particular, if one person is absent (sick, AWOL, etc), the remaining person should be capable of doing the entire presentation on his/her own.

For online classes: You will be placed into a team with 3-5 people total. You can choose who to partner up with (from within your team) and then you and your partner will present the algorithm to the rest of the class by recording a video. The second step of this process involves getting feedback from your team (specifically including those people that are on your team, but aren’t presenting with you) ([see below for details](#_Recording_a_‘Test))

Prior to the first presentation, you should read through the rubric included below in order to understand how you will be graded. A single grade will be assigned to each person in a pair, unless one person does significantly different work than the other one (for example, if one person is absent then the absent person will receive a zero).

**There will be no opportunities to revise presentations.**

## Instructor Preview For Your Presentations

Years ago, before implementing the following policy, a student did a great job of preparing and presenting the wrong topic. The topic they presented was called ‘hashing’, which is technique used in both hash tables and cryptography. The topic they were supposed to present on for this class was hash tables, but they went with cryptographic hashing, instead. In all the years that your instructor has been teaching this class this has only happened once, but it was a very, very awkward presentation to sit through.

In order to prevent that from ever happening again the instructor must look over you’re a draft of your presentation prior to your schedule presentation day. In addition to verityfing that you’re doing the topic the instructor will also provide general, ungraded feedback, so you must provide a ‘mostly complete’ draft. In other words – the instructor doesn’t expect every single thing to be flawless, but all the major pieces should be there and most of the details should be filled in as well (for example, you should have found whatever images you to use, to have included them in your PowerPoint slides, and you should have included those images in your ‘Citations’ / ‘Resources I Used To Make This Presentation’ slide)

For face to face (F2F) classes: You must send the instructor a copy of your presentation no later than the lecture prior to your scheduled presentation date. In other words, if the class meets on Mondays and Wednesdays, and you’re scheduled to present on Wednesday, you need to get the instructor a draft copy of your presentation no later than the end of class on Monday.

For online classes: You must send this to your instructor about a week prior to your presentation date. Keep in mind that you (and your partner) will still need to record the ‘test’ run of your presentation and get feedback from your team, so make sure to allow enough time to do the next step BEFORE your presentation is due.

## Recording a ‘Test Run’ of your Presentation

Once you get feedback on your Instructor Preview you should record a ‘test run’ of your presentation. Make sure that you get together with your presentation partner, research the topic together and/or individually, and then put together a ‘rough draft’ presentation (which you must record and upload to Canvas).

Once that’s done everyone on the team (meaning: both the people who are actually doing the presentation AND the team members who are NOT presenting) should fill out the ‘rough draft rubric’ which is provided through Canvas (in the Assignments area). I’m expecting about 300 words of written feedback from each person. This is a good volume of writing to ensure that y'all give this some thought AND so that y'all don't write too much 😊

For the test run you must upload the ‘rough draft’ video AND all the rubric files (there should be 1 per person in your overall team) AND an INSTRUCTORFEEDBACK file.

## Recording the final version of your Presentation

Once you get feedback on your Instructor Preview you should record a final version of your presentation.

Once you’ve gotten that done please upload the video to Canvas (either by uploading an .MP4 file directly or else by uploading a link to your video).

After that point the instructor will grade the presentation and provide feedback to you and your partner.

### IMPORTANT WARNING: DO NOT UPLOAD ANY VIDEOS TO THE PUBLIC INTERNET UNLESS YOU HAVE PERMISSION FROM EVERYONE WHO IS IN THE VIDEO.

* You can upload videos to your private Google Drive (or Dropbox, etc) but please do NOT post your videos to YouTube/Vimeo/etc unless you have everyone’s permission.
* A great way to get permission is to start the video off with each person briefly saying “My name is <name>, and I give my permission to post this video publicly on the Internet”. Ideally, you should be looking into a web cam when you say this so it’s 100% clear that you’re really you.
* You can also save the videos into .MP4 format and then upload those video files to Canvas

# Suggested Structure for the Presentation

This is the structure that I would suggest using to format your presentation. You’re free to modify this format, although I’d recommend checking with me before leaving out something, or massively changing it.

1. **Introduction / Identification of the algorithm to be presented**Make sure to explain the problem that the algorithm solves. Also explain how it compares to other algorithms, in a couple quick sentences. In a nutshell, why would anybody want to want to use it?
2. **Properties of the algorithm, notes on the algorithm**
   1. Running time  
      Min, avg., max time
   2. Space required  
      For example, if you're presenting a sorting algorithm, does the sort require extra space, or is it ‘in-place’?
   3. Limitations and Strengths  
      For a sorting algorithm, can it sort an array? A linked list? Are there any particular situations wherein the algorithm does badly / can't operate at all, or where it does well?   
      For example, if you mentioned in the introduction that B+ trees are often used in databases, now would be a good time to explain that the large fan-out minimizes the number of hard drive pages that need to be accessed, thus speeding the overall performance.
3. **Overview:**
   1. Verbal description of the main idea
      1. Divide-and-conquer (Mergesort, quicksort)? Explain what this means.
   2. Verbal explanation of why the algorithm works (intuitively)
   3. (Pseduo-)code on the whiteboard, run through a couple of examples
      1. Boundary conditions: single element array, etc.
4. **Technical Demonstration: show your code in Visual Studio**
   1. Use Console.WriteLine statements to get the program to print out a ‘trace’ of what it’s doing.
5. **Questions and Answers**  
   Following your presentation, you should anticipate questions from the audience. Whether or not your fellow students have any questions, you should anticipate that the instructor will definitely have questions for you ☺.

# Evaluation Rubric

Each presentation will be graded, in part, with the help of the following rubric. Each category is rated on a scale of 1 to 5, 1 being bad and 5 being good.

* **Technical Knowledge  
  How well you convey a sound, technical understanding of the material.**

1. Able to provide a sound motivation for using this particular algorithm.   
   Including concrete examples of use.
2. Sound understanding of the algorithm and it’s properties
   * Both overall, and details
3. Correct description (including pseudo-code)
4. Correct analysis (running time, etc)
5. Code correctly implemented program works (in C++, C#, Java, etc)

* **Preparation  
  The work you do prior to your presentation**

1. Prepared in advance
2. Either no technical problems during presentation, or else they’re dealt with quickly and efficiently. Unforeseen problems that can't be solved during the presentation should be worked around in a professional manner.
3. Makes effective use of available resources.  
   You're not required to use anything in particular, but merely standing in front of the class and talking isn't acceptable. You should produce several concrete objects (such as PowerPoint slides, notes, handouts, etc)
4. Lasts about 20-30 minutes

* **Delivery  
  The actual execution; How the materials are delivered to the audience.**

1. Presentation begins promptly.  
   If you need to log in, start up Visual Studio, or load a web page, then you've done this prior to the start of class.   
   Overhead projector is warmed up.
2. Explanation is clear, including verbal description, whiteboard run-throughs, and source code
3. Explanation is concise.
4. Questions are addressed in a clear and effective manner.
5. Every member of the group does a roughly equal amount of work during the actual presentation.

## What to turn in:

If you can produce electronic materials (note in Word or PDF documents, etc), I'd greatly appreciate it. If you can't, that's fine too. However, you must hand in a copy of all the materials you use in your presentation, either electronically or upload pictures of your hard-copy. Make sure to clearly include the names of all group members someplace easy to find (for example, in the footer of PowerPoint slides, or in comments at the top of source code files, etc)

## How to electronically submit your homework:

Please use the Canvas system. There is a link on the course home page.