

Conceptual Presentation

Due Apr 13 by 11:59p.m. **Points** 100 **Submitting** a file upload **File Types** pdf **Available** after Mar 2 at 10a.m.

CS Concept Presentation

Presentations will be given on 13 April during class time. Your group's slides and handouts (with appropriate citations) and your bibliography are due in this Canvas assignment by 13 April at midnight. Peer reviews are due April 16th.

You must choose your topics on the Piazza thread by midnight on 14 March. The Piazza thread to register for presentation topics will be available starting 12 March at 5:30pm.

In 3 person teams, you will make an informative presentation about a fundamental computer science concept or aspect of C Programming that we haven't covered in class. There is a list of example topics below. The goal is for the 3 group members to identify a topic, research it, decide what's most important about what you've learned, decide how to present it, and craft and deliver a presentation with all the related supporting materials.

Requirements

1. Your topic must be approved by the professor.
2. At least once after topic approval and before the presentation, all three group members must attend the professor's office hours together to discuss the presentation.
3. Verbal presentation that educates the audience about the topic
 1. Lasts a maximum of 12 minutes, plus a question-and-answer period of 2-3 minutes (total 15 minutes). Remember that this time is a -maximum-.
 2. Explain the most important aspects of the topic in a clear and easy to understand way
 3. Demonstrate to your classmates 1-2 ways they could use the information they learn from your presentation in their programming
4. Visual learning aid (slides, demonstrations, etc.) that enhance your presentation. These materials must be submitted to Canvas by the due date.
5. A one-page handout summarizing key points and how the audience can use this information in their work. The handout can be two-sided, but should be only 1 page.

1. These materials must be created by you, not by anyone else.
2. These materials should help your classmates understand and remember the important parts of your presentation
3. This handout should be given or distributed to your classmates at the end of your presentation
4. This handout must be submitted to Canvas by the due date
6. A bibliography must be submitted to Canvas by the due date for all sources used. Proper citation must be used in all materials presented and handed out; videos from other sources cannot be used. Pictures and infographics from other sources may be presented, but only if their source is properly cited using IEEE format when the image is presented, and in the bibliography.
7. Teammates review completed at teammatesv4.appspot that gives feedback to teammates and to me about your teammates' contributions, the division of labor, and the outcomes of that labor division.
8. You must develop and turn in a communication plan, but this communication plan is part of another assignment/turn-in. Your group will be expected to abide by the guidelines you've set out in your plan.

Recommended Steps to Prepare for a Presentation

1. Meet with your group members and select a possible topic
2. Discuss with your group members how you will divide the tasks and work for the presentation. Discuss how often you will meet, and when, and how (i.e., Zoom? In person?). This is a crucial step for all groups!
3. Submit your topic to the professor on the designated Piazza thread for approval. Your topic does not have to come from the list of example topics, and every group must cover a different topic (i.e., no duplicates)

IMPORTANT: At some point between Step 4 and Step 9 below, all three group members must together attend the professor's office hours to discuss the presentation.

4. Think about what your audience might already know about your topic, and then decide how to connect the new information you will present to what people already know. You don't want your presentation to be too simple or too complex
5. Organize the information you're presenting into sub-topics or sections that follow a logical progression
6. Decide how you'll explain the information to the audience, particularly emphasizing and prioritizing the information that will be most interesting and useful to the audience
7. Decide how the information should be visually presented during your talk (Animated slides? A poster? Dramatic re-enactment or dance?)
8. Craft the presentation materials
9. Script the presentation (decide what will happen in what order and who will do what)

10. Practice delivering each part of the presentation
11. Rehearse the presentation exactly as it will happen
12. Anticipate what questions might be asked, and practice responding to them
13. Ensure that all of your required materials are submitted to Canvas by the due date

Possible Topics

Programming topics, libraries, and tools in C



For a programming topic, explain what the structure is and how it works. Relate its functions to what the audience already knows how to do in C. Show how the structure can be used, and explain when the audience would want to use it. Demonstrate the structure's use, explain why the audience should consider using it in the future – what it's best at doing, and how it can be more effective than other ways they could do the same thing in C.

If you're presenting a library, some of them are quite big. Explain the overall purpose of the module, and then show us how to do 1-2 useful things with the library. Relate the things this library can do to what we can already do in C. You should teach us at least one thing that's easier to do with this module than in standard C; otherwise, why would we use the library? If you're demonstrating a library, make clear when the library would be useful, and why would be doing whatever the library helps them do. Not all libraries are acceptable; your topic must be approved. Example libraries, tools, or topics (even if your proposed topic is on this list, you must get it approved:

- How to represent non-English alphabet characters in C and convert between character types
- Annex K functions for bounds-checking
- Unit testing framework for C: Google Test, CUnit, Unity, DejaGnu, or CppUnit (I recommend CUnit or Google Test, they're the most popular)
- Static code analyzer: Clang's llvm static analyzer, Microsoft's visual studio code C++ static code analyzer, etc.
- Make and makefiles
- Error handling in C: errno.h
- GLib (and the problems it is trying to solve)

Systems Topics

Explain the overall systems concept, and how it matters to administrators and users of a system. (Be careful with these, they are big topics - you would only be explaining the basics of these topics. Any of them would be possible week-long topics in CS 5600 Systems).

- Virtual memory
- POSIX threads and concurrency (mutex locks, etc.)
- Access control methods (Access Control Lists or User groups; PAMs)
- Process scheduling and scheduling priority
- if you want to look at these and other systems topics, take a quick tour through OSTEP <https://pages.cs.wisc.edu/~remzi/OSTEP/>  (<https://pages.cs.wisc.edu/~remzi/OSTEP/>). You can also check out any topic after chapter 7 in [The Linux Programming Interface](https://learning.oreilly.com/library/view/the-linux-programming/9781593272203/xhtml/ch08.xhtml)  (<https://learning.oreilly.com/library/view/the-linux-programming/9781593272203/xhtml/ch08.xhtml>)- except topics we cover like sockets, of course!

CS Topics (these can use examples in C but must be more general)

Explain the overall CS concept. Make sure to include some visual explanation of the concept. Explain how this concept can be used in programming, and how it relates to concepts that we have already learned. When and where is this concept most useful? Why would we use what you're showing us, and under what conditions? Include a demonstration of this concept's use – it does not have to be coded out in C, but you need to explain when we would use it.

- A type of sort we haven't covered (heapsort, a common hybrid sort, radix sort etc.) - no counting sort, no randomized quicksort
- A data structure we haven't covered (b trees, red-black trees, disjoint set forests, flow networks or bipartite graphs for bipartite matching problems, etc.)
- A network protocol that we haven't covered or a part of internet infrastructure we haven't covered (SMTP, SSL, TLS, DNS, etc.)
- An algorithm we haven't covered (be sure that it works on a data structure that we have covered): Floyd-Warshall, Kruskal & Prim, multi-threaded merge sort, Ford-Johnson, union-find (which we can only do if someone else does disjoint set data structures), Rabin-Karp) etc.
- An NP complete problem (vertex cover, set cover, SAT) – no traveling salesmen
 - finite automata, etc. - includes the theory of computation behind regex

OR! Propose your own topic and get it approved

How your presentation will be evaluated

The presentation will be worth 100 points. The following factors will be considered:

- Is the presentation effective at explaining the topic? Specifically, is the presentation organized in a logical way, including an introduction to the topic that connects to what the audience already knows? Do the presenters make analogies or comparisons to what the audience already knows, so that the audience can integrate this knowledge? Your goal is to explain this concept such that your classmates can follow and understand what you are talking about. (20 points)
- Does the presentation have a visual component that emphasizes the key points and takeaways? (15 points)
- Is the presentation technically correct? (20 points)
- Is the presentation well-paced and easy to understand? Can everyone in the room hear what's being said, and is the pace of the presentation appropriate (not too slow, not too fast)? (10 points)
- Do the presenters give the audience a handout or other informational reference to take home after the presentation? Does that handout emphasize key information, and show the audience how they can use this information in their work? (10 points)
- Do the presenters, to the best of their ability, answer the audience's questions, and explain what they know and what they don't know about the answers to particular questions? (10 points)
- Did the group evenly divide the work so that everyone's contribution is significant? Did they fill out their evaluations in a professional, respectful, and constructive way on teammates? Did the group come to the professor's office hours at least once to discuss the presentation? (10 points) ***
- Does the submitted bibliography cite all sources used in every part of the presentation, using IEEE citation style or another consistent and recognized citation style? Are all of the still images or visuals that were not created by the group cited properly, both in the slide deck and in the submitted bibliography? (5 points)

***If any group has problems agreeing on how to divide the work, or if some group members think that other people in their group are not doing enough work, all students involved must contact the professor as soon as an agreed-upon deadline or meeting has been missed, or as soon as a group member is "non-responsive" according to your communication plan. The professor will help the group find a way to work together effectively and, if this is not possible, non-cooperative or non-responsive group members will be removed and will be required to give their own presentation. You must communicate with the professor as soon as your group has issues with communication or collaboration.

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