Overview: The content your discussion group creates in this document will be synthesized in a blog posting for https://bssw.io

Instructions:
1. Pick one person in your discussion group to create a new copy of this Google Doc
2. Make a copy of this template in a new Google Doc (the person from step 1)
3. Share the edit link to the document in step 2 with others (copy and paste into Zoom chat)
4. Co-edit the document: Can have one lead writer with others modifying, or another approach
5. Send the document to Mike Heroux at the end of the session by email (mheroux@csbsju.edu)

Add group member names for anyone who wants attribution in the blog post:

Name, affiliation as you would like it listed in the blog post
1. Johanna Cohoon, UT Austin
2. Jed Brown, CU Boulder
3. James Willenbring, Sandia National Labs
4. Vadim Dyadechko, ExxonMobil
5. Elaine Raybourn, Sandia National Labs

Add a paragraph describing each person's software team background and experience. Emphasize experiences that inform your opinions about challenges, and how to improve software teams. Can add paragraphs in parallel :)
- Vadim Dyadechko @vdyadechko
    - PDE solvers, DevOps
    - Communicating with HPC experts and subject matter experts (engineers and geoscientists)
    - How to find the right balance between code usability/maintainability/functionality?
    - How to align the team members on project priorities without imposing structures?
    - How to make a good team out of a group of strong individuals?

- Jed Brown @jedbrown
    - I've been an open source developer, both starting new projects and in larger communities, since grad school. I'm co-maintainer of PETSc and maintainer of libCEED, and work with many other projects and communities in computational science and engineering. I'm Associate Editor for the Journal of Open Source Software (JOSS). I'm interested in effective process and leadership for multi-stakeholder teams to foster healthy and collaborative communities.
- James Willenbring - @jwillenbring
    - Trilinos Project team - Framework product lead

- Challenge: research to production software transition and how to instill this in a research-focused team
    - ECP E4S/SDK team - Ecosystem SDK L4 lead
        - Challenge: coordinating distributions and testing across many mostly independent teams

- Johanna Cohoon, @jlcohoon
- Elaine Raybourn, @elaineraybourn
    - Social scientist combining technology, culture, communication
    - Usually the user advocate on teams
    - Lead PSIP for ECP, has been on software teams developing context aware tech, game-based training, collaborative virtual environments
    - Team of teams research
    - Enjoys developing tools that change ways people play, work, etc. Hopefully for the better. :-)
- Weslley Pereira, @weslleyspereira
    - LAPACK developer / maintainer, University of Colorado Denver
    - Background on Pure Mathematics and Computer / Computational Sciences
    - Currently working on the design and implementation of a C++-template LAPACK library.
    - Currently learning on how to work on a highly-used scientific software.

Discuss as a group the most important challenges you see facing scientific software teams. Try to refrain from solving the challenges (that's tomorrow and the next day). Summarize discussion in outline form.
- Challenge 1: Aligning different teams' expectations and empowering them to contribute +1
    - Need to create a comfortable place for all to contribute
    - Difficult to align different expertise: domain vs HPC experts have different preferences for their development approach, not having the expertise to understand one another's priorities **(Jed and Vadim have examples of this)**
    - One group might (necessarily) act as a gatekeeper
    - Executing and communicating decisions might be difficult while being respectful
    - Need to create trust between groups
    - Smart people working with no leadership doesn't necessarily make for success

- Challenge 2: Lack of time
    - Simultaneous push for being more productive/creating a polished product
    -
- Challenge 3: Identifying who will be part of the project for the long term +1+1+1
    - Responsibilities might be different if they're part of a project vs more facility-oriented team
    - People leave for industry
    - Need to build trust through long term investment
    - Possible rephrase: sustaining project knowledge and trust

- Challenge 4: Fostering career paths +1+1+1+1
    - Supporting maintainers who don't want to be PIs
    - Without being recognized and funded, non-PIs might find it difficult to continue contributing and to establish their career
    - "Why can't I be a phenomenal contributor?"
    - Managing the project requires different skills from contributing code
    - Distributing credit: credit goes to those at the top—not distributing it can create tension
    -
- Challenge 5: funding for evaluations or improving software quality +1+1+1
    - Need to understand if software is fulfilling its purpose
    - Need sponsor to value code of a certain quality
    -
- Challenge 6: establishing good leadership +1+1
    - Being a project manager isn't necessarily a valued scientific contribution
    - How are leaders selected? (Organic side-effect of career growth *in other sectors*.)

- Challenge 7: creating scientific value and software +1+1
    - Being evaluated based on software might be undesirable for them?
- Challenge 8: software quality means different things to different people +1+1+1 (related to 1)(related to 12)
    - Effort vs payoff balance
    - Innovation vs stability balance
    - portability
    - Different stakeholders have different concerns and might be funded to do work they are less personally concerned with
- Challenge 9: turnover in project team +1+1
    - Students are temporary but require training
    - Lack of preparation for a turnover of responsibility makes this especially difficult
    - Current members' notes might not be understandable to others
    - Many types of documentation are needed
- Challenge 10: merged into another challenge.
- Challenge 11: enabling bottom up change +1+1+1
    - Team members should have some autonomy (important also for them establishing careers)
- Challenge 12: establishing a diverse team +1+1+1 +1
    - Team should reflect diversity of users
    - Limited ability to hire, PI careers require voluntarily sticking with community
    - Difficult for students and junior people to imagine their future career
    - True regardless of status as developer or domain expert

About 20 prior to the end of the session, around 1:40 pm CDT, try to reach consensus on 3 - 5 high-level challenges your team identified

- Challenge 4: Fostering career paths
- Challenge 12+8: building a diverse team, culturally and technically
- Challenge 3: building a team to sustain institutional knowledge and community trust (rephrased from above)
- Challenge 5: funding for evaluations or improving software quality
- Challenge 11: enabling bottom up change