<table>
<thead>
<tr>
<th>Plicker</th>
<th>Emma</th>
<th>Jacob</th>
<th>Steph</th>
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<tbody>
<tr>
<td></td>
<td>Noel</td>
<td>Tianzhi</td>
<td>Abraham</td>
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<td>Walter</td>
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<td>Brendan</td>
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<td>Scott</td>
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<td></td>
<td>Jacqueline</td>
<td>Zachary</td>
<td>Lillie</td>
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<td>Caroline</td>
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<td>Gebre</td>
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<tr>
<td>Michael</td>
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</table>
Quantum Computing

CS 333
Learning Goals (for today):

• Familiarize yourself with course basics
• Be able to describe learning
• Understand motivation for technology and group policies
• Qualitative understanding of quantum measurement
Learning Goals (for this Class):

• Apply mathematical tools to describe, analyze, and solve problems related to quantum information and computation protocols.
• Build intuition about what properties of quantum mechanics lead to advantages over standard computation.
• Appreciate the limits of quantum computation.
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• Apply mathematical tools to describe, analyze, and solve problems related to quantum information and computation protocols.
• Build intuition about what properties of quantum mechanics lead to advantages over standard computation.
• Appreciate the limits of quantum computation.

Outline…
About Me

• Shelby Kimmel
  – What to call? Professor Kimmel, Professor
  – Pronouns? she/her pronouns
  – Outside interest? Samulnori (Korean contemporary folk percussion)
Learning Goals (for today):

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Learning from biological perspective

- Learning is the process of developing new connections between neurons in your brain.
Learning from biological perspective

• Learning is the process of developing new connections between neurons in your brain.

• New connections are created by repeatedly practicing new behavior. By practicing any task, can rewire your brain to become “smart” at that skill.
Learning from growth mindset perspective

<table>
<thead>
<tr>
<th>Fixed Mindset</th>
<th>Growth Mindset</th>
</tr>
</thead>
</table>

## Learning from growth mindset perspective

<table>
<thead>
<tr>
<th>Fixed Mindset</th>
<th>Growth Mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task A is easy because I’m smart.</td>
<td>This is easy because my brain already has necessary connections.</td>
</tr>
<tr>
<td>Task B hard because I’m not good at this type of thing.</td>
<td>This is hard because I need to create connections in my brain that weren’t there before.</td>
</tr>
</tbody>
</table>
# Self-test

<table>
<thead>
<tr>
<th></th>
<th>Fixed Mindset Reaction</th>
<th>Growth Mindset Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges</td>
<td>Avoid</td>
<td>Embrace</td>
</tr>
<tr>
<td>Effort</td>
<td>Problem</td>
<td>Progress</td>
</tr>
<tr>
<td>Criticism</td>
<td>Personal</td>
<td>Helpful</td>
</tr>
<tr>
<td>Failure</td>
<td>Evidence of inability</td>
<td>Temporary</td>
</tr>
<tr>
<td>Success of others</td>
<td>Threatening</td>
<td>Inspiring</td>
</tr>
</tbody>
</table>
Learning Take-aways

• Give yourself time
Learning Take-aways

• Give yourself time

• Learning is Uncomfortable (at first)
Learning Take-aways

• Give yourself time

• Learning is Uncomfortable (at first)

• Practice the skills you need
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Computers or devices in class generally negatively affect learning

- Studies show students who write notes on paper learn more than those who type.
- Studies show students who use laptops/phones spend up to 1/3 of their time “zoning out” (using Instagram, checking e-mail, etc) and consequently have lower exam scores.
- Studies show if you use a laptop, your classmate’s exam scores will be lower.
Computers or devices in class generally negatively affect learning

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For some students, devices are a critical tool for learning.
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- **Studies** show if you use a laptop, your classmate’s exam scores will be lower.

For some students, devices are a critical tool for learning

Policy: Use technology judiciously. Avoid unless you have a good reason for it.
Learning Goals (for today):

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Group Problem Solving
Group Problem Solving

- Working in a group improves learning
- I don’t care whether you get to the solution
- I care about whether groups are functioning in a way that helps you to learn
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What behavior should I look for in a group that is maximizing learning?
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What behavior should I look for in a group that is maximizing learning?

- Active listening: rephrase what a group mate said
Group Problem Solving

- Working in a group improves learning
- I don’t care whether you get to the solution
- I care about whether groups are functioning in a way that helps you to learn

What behavior should I look for in a group that is maximizing learning?

- Active listening: rephrase what a group mate said
- Ask questions if you don’t understand
- Be skeptical of what others say – suggest alternate approaches.
- Encourage participation
- Make sure everyone in the group understands a point before moving forward
Website tour!

go/CS333