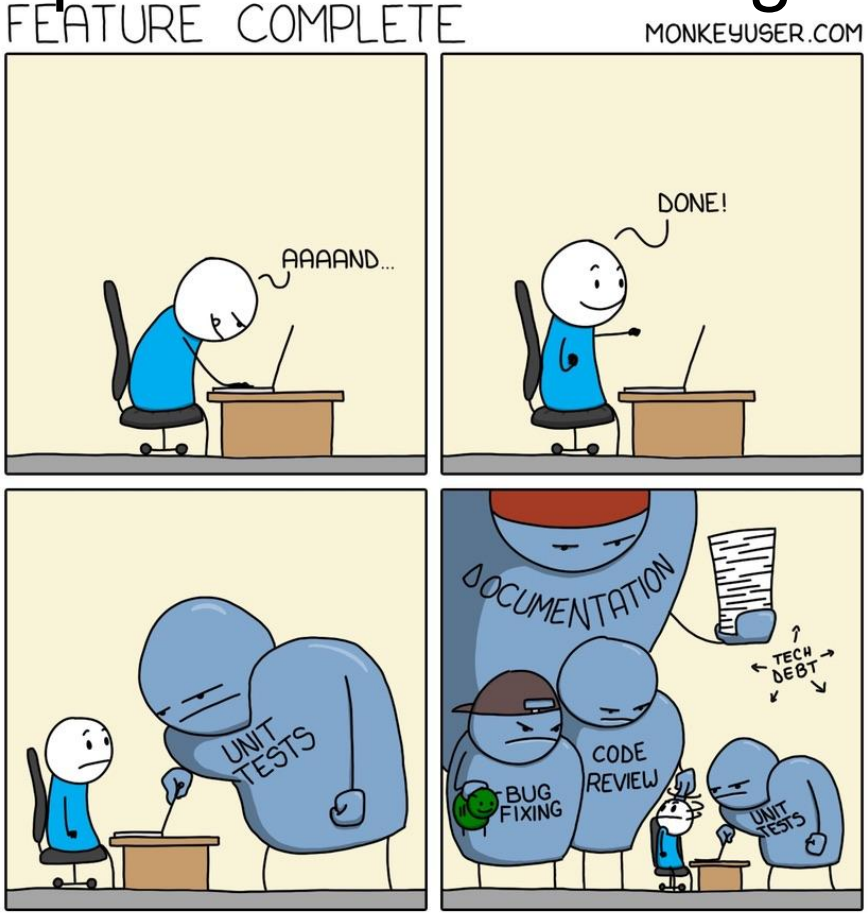
COSC 499: Capstone Software Engineering Project



Traditional Waterfall Model

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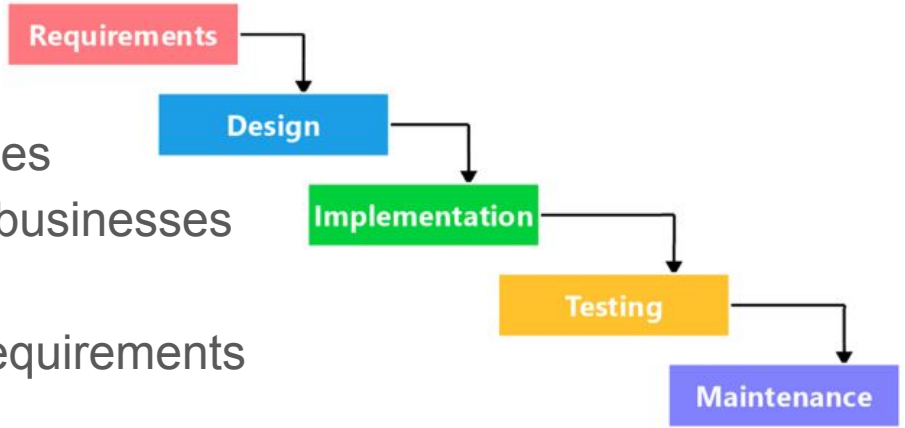
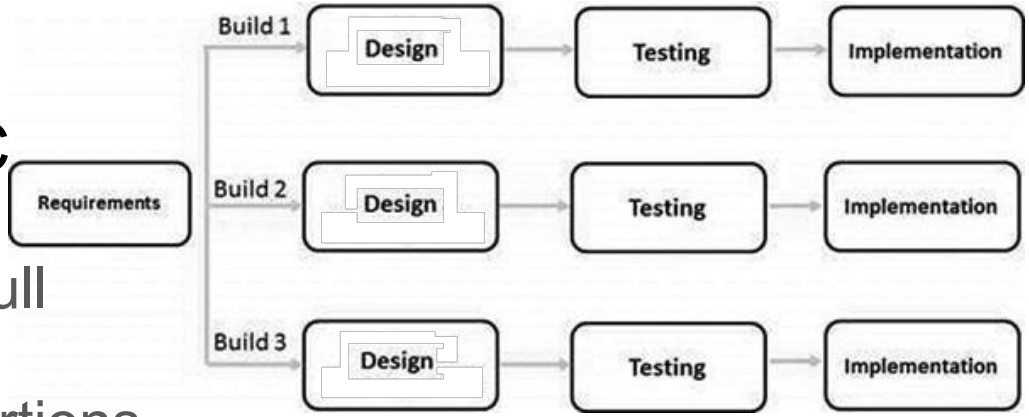
- Waterfall model
  - Linear model with sequential phases
  - Easy to understand and adopt by businesses
  - Expensive to fix and maintain
  - Cannot accommodate changing requirements



Iterative/Incremental SDLC

- Does not attempt to have full spec of requirements
- Incrementally add small portions



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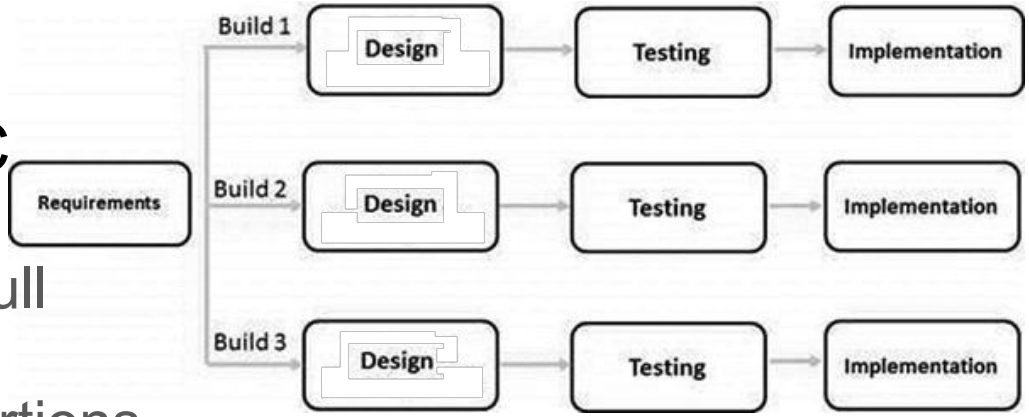

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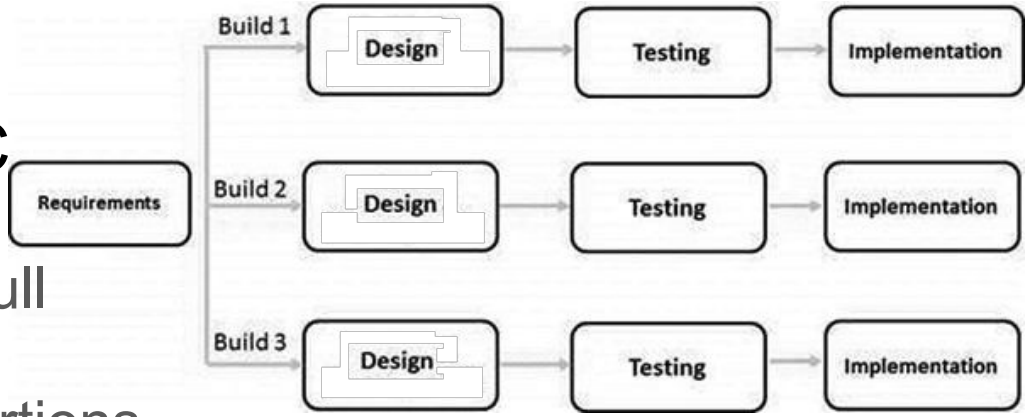

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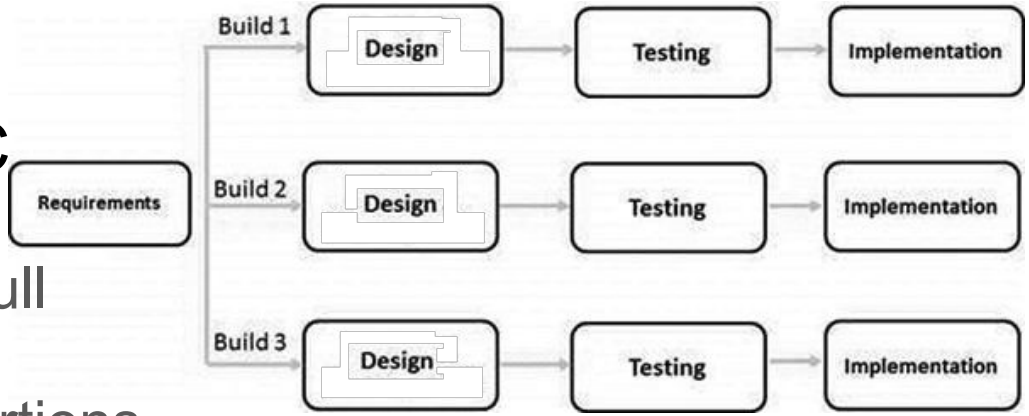

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Agile SDLC

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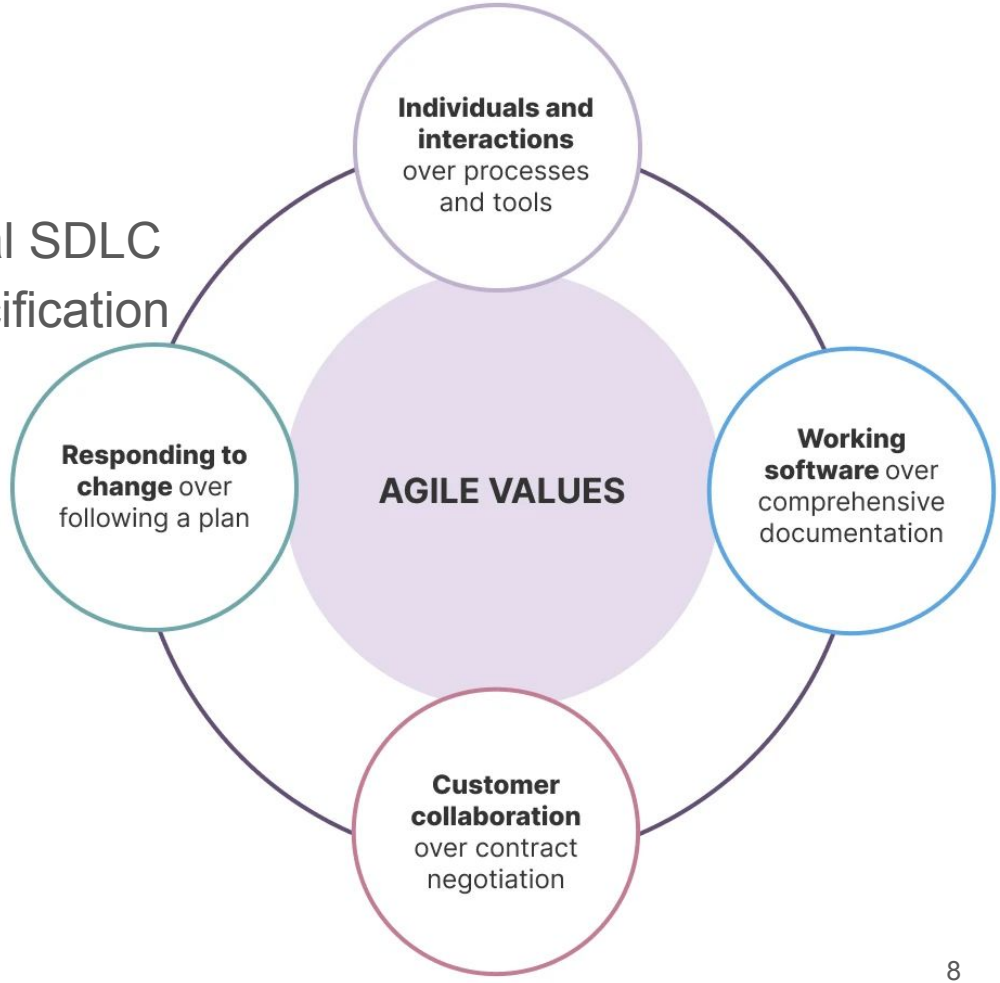

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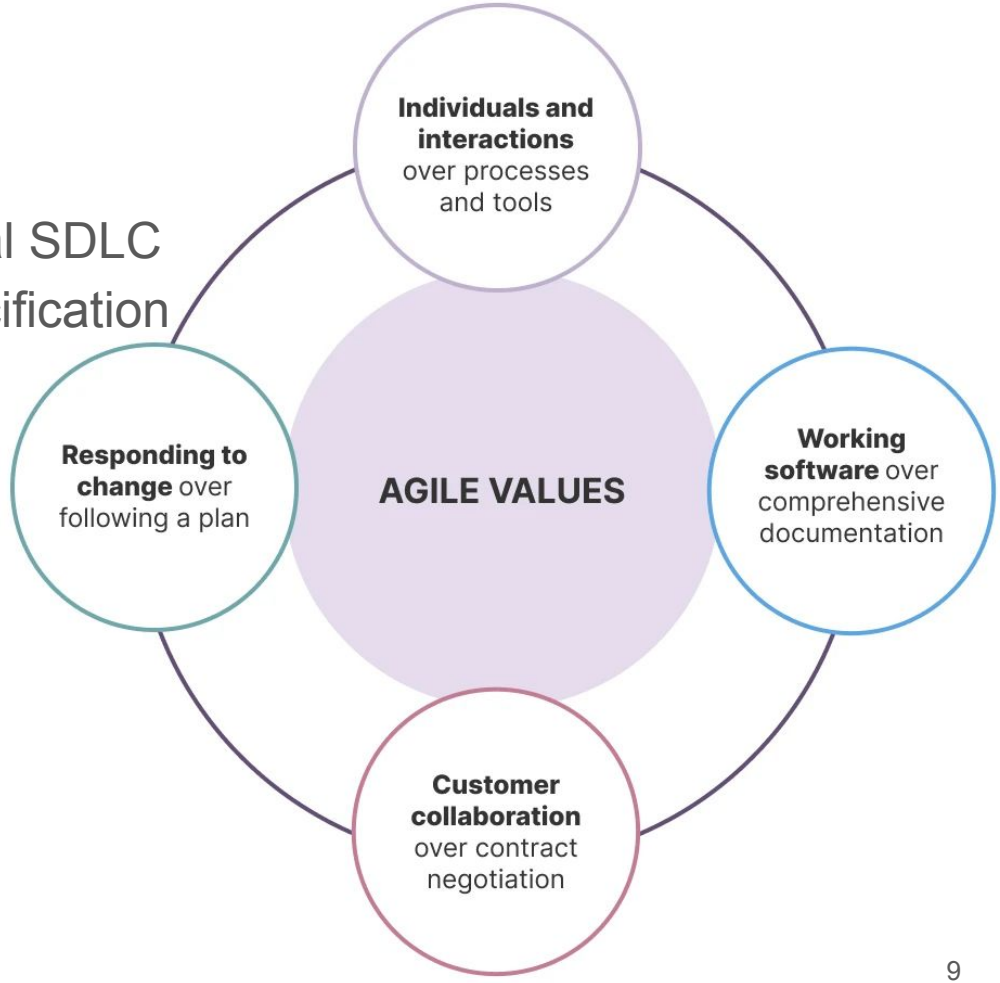

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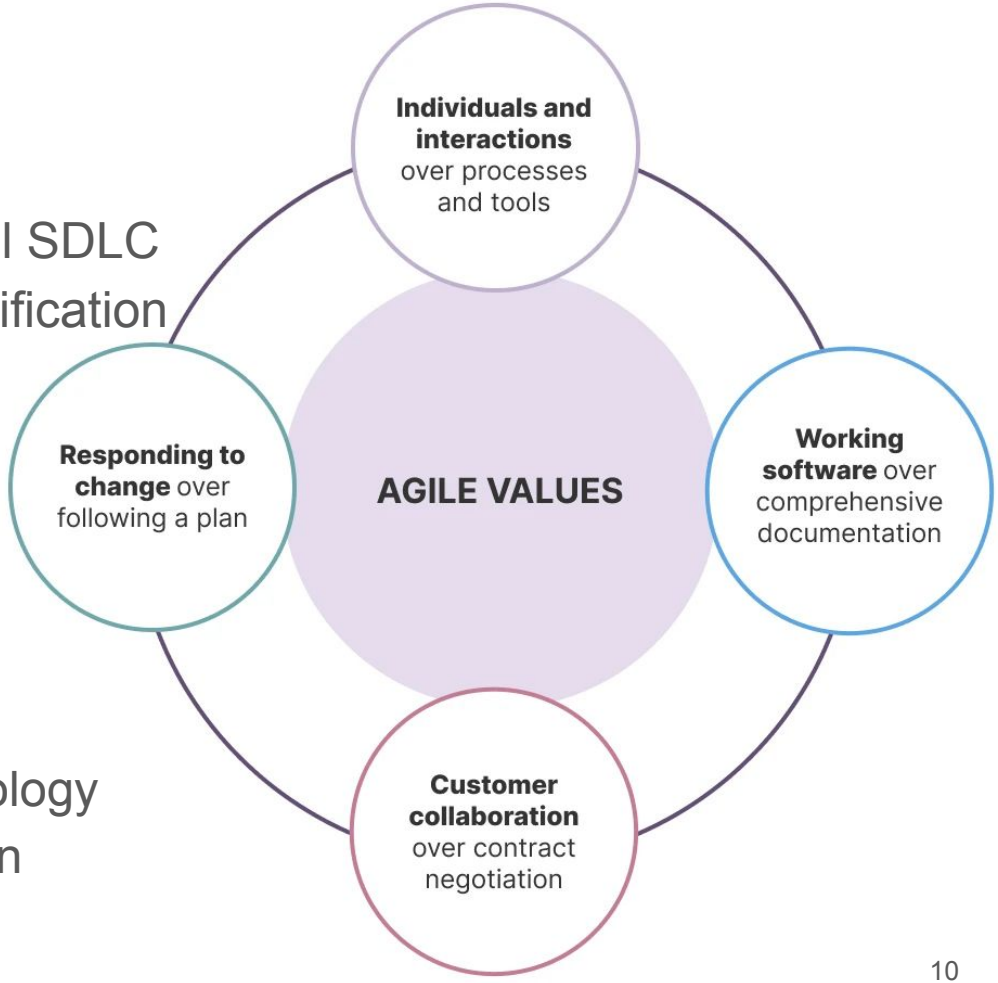
- **Challenges:**
  - Hard to budget and manage
  - Challenging to transfer technology due to a lack of documentation



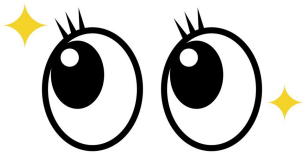
```python
class WeightRun(Run):
    def start(self, num_trials: int = 1, generate_graphs: bool = True):
        scenario = BowenScenario2()

        metrics = [
            AverageCosineDifference(
                name="Score Cosine Difference",
                attribute_filter=[Attributes.SCORE.value],
            ),
            AverageCosineDifference(
                name="Timeslot Cosine Difference",
                attribute_filter=[ScenarioAttribute.TIMESLOT_AVAILABILITY.value],
            ),
        ]

        student_provider = BowensDataProvider2()

        artifact: SimulationSetArtifact = SimulationSet(
            settings=SimulationSettings(
                num_teams=ceil(student_provider.num_students / 4),
                scenario=scenario,
                student_provider=student_provider,
                cache_key=f"weight_run_for_bowen/weight_run_2/",
            ),
            algorithm_set={
                AlgorithmType.PRIORITY: [
                    PriorityAlgorithmConfig(
                        MAX_KEEP=15,
                        MAX_SPREAD=30,
                        MAX_ITERATE=30,
                        MAX_TIME=100000,
                    ),
                ]
            },
        ).run(num_runs=num_trials)

        team_set = list(artifact.values())[0][0][0]

        insight_output_set = Insight.get_output_set(artifact, metrics)
        print(insight_output_set)

        data = [["ResponseId", "Q8", "Q4", "Q5", "zPos", "TeamId", "TeamSizeViolation"]]

        for team in team_set.teams:
            for student in team.students:
                attributes = student.attributes

                responseId = student_provider.get_student(student.id)

                timeslot = attributes[ScenarioAttribute.TIMESLOT_AVAILABILITY.value][0]
```

Code snippet in medium size repo

Context: New employee asked to run an algorithm with specific parameters

What do you foresee as potential challenges?

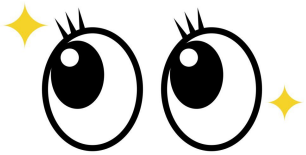
Writing Constructive Code Reviews



- Purpose:
  - Share knowledge
  - Spread ownership
  - Unify development practices
  - Quality control

Remember: You will be tested on *any* part of the repo, even if you didn't develop it

Writing Constructive Code Reviews



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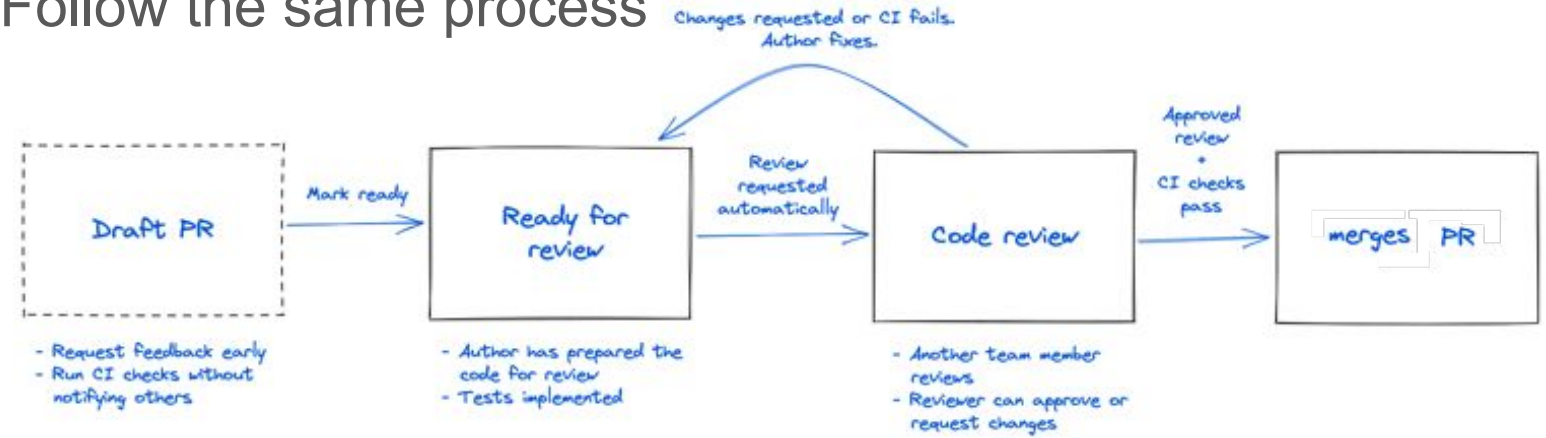
- Follow the same process



What to Comment On?

- **Functionality** - behavior as intended?
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- **Complexity and design** - easy for others to understand? follow standard patterns?

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- **Tests** - are they complete? do they pass?
- **Complexity and design** - easy for others to understand? follow standard patterns?
- **Naming** - are they descriptive and follow pre-established conventions?
- **Comments** - are they clear and helpful?
- **Documentation** - are associated docs updated?

Things to Keep in Mind

- Keep PRs small
  - Earlier feedback
    Easier for others to review
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- PR authors have feelings too