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P4. Online Programming Exercises

Online Programming Exercises

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Introduction

Introduction to Online Programming Exercises

Despite the fact that students often work on projects alone, most developers will be working on a team for most of their career. Working with others in a team is a very important skill for developers to have. In this class you will participate in an Online Programming Exercise (OPE) where you will be working together as a team to not only solve programming challenges, but also to build your teamwork skills.

What is an Online Programming Exercise?

An OPE is a software development process where an entire team works on the same code, at the same time and on the same computer. In some ways, you can think of it as an extension of pair programming, but instead of two people working together, an entire team works together. Similar to pair programming, there are roles that should be adopted when participating in an OPE. Throughout an OPE, participants will rotate between roles. The roles are:

1. The **Driver** implements the decision of the team by writing code. This role is focused on the implementation details of the code.

2. The **Navigator** solicits ideas from everyone in the team, listens to them, and then tells the Driver what next step should be implemented. This role is focused on guiding the group interactions and deciding what to do next.
3. The **Researcher** accesses external resources that may be helpful to the team. In our task for instance, it can be the primer, StackOverFlow, or official documentation for an API or programming language. This role is focused on supporting the Navigator and Driver.
4. The **Project Manager** is responsible for encouraging everyone to participate, and reporting various milestones as the group reaches them. This role is focused on ensuring the group ends up meeting the requirements as expressed in the assignment.

When working together as a team, it is very helpful to follow Test Driven Development (TDD). As you remember, TDD is a process for writing code, where the code is written in very small cycles. First, a failing test case is written, then just enough code is written to make that test pass, then optionally the code can be refactored.

While participating in an OPE, the group will work best when following TDD. Tests serve to clearly document the progress the group is making. A failing test clarifies what the next objective should be (to get the test to pass), while a passing test signifies that a milestone has been passed. Also, by focusing on making incremental improvements, the group can focus on small manageable units of change.

For this OPE, you will be working together in Cloud9, an online collaborative IDE hosted on AWS. Code can be written, run, and debugged on AWS Cloud9. A bot facilitator will mark different phases of the OPE, first the bot will provide you with time to explore and familiarize yourself with your workspace. The bot will also use the chat to tell you when to begin the task and what roles each person will take. It will provide a time warning when there is an upcoming role switch and then indicate the new roles that you need to assume. You will have an opportunity to interact with the bot in a sample OPE.

Working together as a team

When participating in an OPE, it is imperative for the team to work well together. To do this, each team should commit to treat everyone with Kindness, Consideration, and Respect.

Kindness

All team members should treat all other team members with kindness. All team members should treat others the way you would like to be treated.

Consideration

We show consideration by listening. The Driver should be listening to the Navigator. The Navigator should be listening to the researcher and the project manager.

Respect

We show respect by always assuming that the person who wrote the code before us did the best they could with the knowledge and circumstances they were in at the time they wrote it.

During the iteration

During each iteration, the group member assigned to the project manager role will have access to a file named `project_manager_dashboard.txt` . This file contains a dashboard that provides suggestions for feedback that can be provided to group members based on how well they are performing in their roles. This is based on an automated measure that can sometimes make misattributions. The project manager should therefore, use this information along with their own judgement to provide relevant feedback to group members about how they can better perform their roles.

End of iteration

At the end of the iteration, when prompted by the agent, the project manager will lead group members through a discussion phase. The focus of the practice OPE is to help group members understand how to utilize the roles to better function as a group. So, the discussion will involve reflecting on the roles and how group members think they could have better performed them. In future OPEs, the discussion will be more focused on learning about the task itself.

The discussion will happen in a round-robin fashion with each member getting a chance to reflect on the role they played in the iteration that just concluded. In this OPE, the goal is to gather ideas about how the roles can be performed better so that other group members can implement those ideas in future iterations. This is an opportunity to talk about what group members found challenging/confusing while performing their roles.

Cloud9 Setup

Accessing AWS Cloud9

Log in AWS console from `https://752574329361.signin.aws.amazon.com/console` using the AWS IAM user and password shown in your Sail() profile `https://projects.sailplatform.org/profile`.

You can now visit the Cloud9 (https://console.aws.amazon.com/cloud9/home/shared) console. Make sure you choose the region as `N.Virginia`.

You will see a Cloud9 environment shared with you only during your scheduled time for the OPE.