Introduction to the Study of Avian Genetics and Evolution

Bioinformatics Final Project - Winter 2024

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Project Introduction

In this project, you'll delve into the fascinating realm of bird genetics and their evolutionary paths. It's an opportunity to use bioinformatics methods to tackle actual biological puzzles, with a particular emphasis on uncovering genetic secrets and the evolutionary links among various bird species. To get started, you can find all the project materials in the GitHub repository here.

Project Tasks

Refer to the README of the github repository.

Methodology and Freedom of Exploration

Throughout these tasks, you are encouraged to employ a variety of bioinformatics tools and approaches. The aim is to foster creativity, problem-solving skills, and the practical application of theoretical knowledge.

GitHub Workflow and Review Process

Manage each task via GitHub for collaborative development and iterative learning. Early completion of tasks will be met with detailed feedback, providing opportunities for further improvement and learning.

Grading and Bonus Structure

Overview

The grading system for this project is designed to recognize and reward in-depth effort, creativity, and adherence to best practices. Each task includes embedded bonus opportunities, and we will also acknowledge any extra depth or analysis that goes beyond the specified task descriptions.

Base Points

- Your project starts with a base of 4 points.

Multiplicative Bonus Factors

- **Clean Coding**: We strongly encourage clean, modular code with reusable components. Exceptionally well-written code will multiply the task's grade by 1.1, and truly outstanding code by 1.2.
- **Git Best Practices**: Effective use of Git, including good commit practices and clear commit messages, will yield a multiplicative factor of 1.1 on the task's grade.

Soft-Cap Bonus

- You can gain an extra 1.5 points by completing bonus activities within each task or meeting other bonus criteria. This can raise your total to 6 points.

Extended Bonus Opportunity

- If you're aiming beyond 5.5 points, there's a chance to earn one more point. This is quite challenging and doesn't include regular bonuses like clean coding. The criteria here are open: you get this point for putting in a lot of effort, adding educational value, and documenting your work well.

Task-Specific Bonus

- While each task might have its own bonus activities, you're not limited to these. The course is designed for you to get practical experience, so feel free to expand your notebooks in creative ways. This could mean going deeper into a topic or covering more ground.
- We haven't set strict rules for bonus points for each task because there are many ways you could approach them. You can make your task broader or more detailed. We know this might seem a bit uncertain, but it's hard to have a fixed rule for every possible expansion you might think of.
- If you do extra work that you think deserves a bonus, please write about it in a dedicated document. Explain what you did, why it's valuable, and what you learned. Include anything else you think is important.
- You can expand almost all tasks in different ways. Whether you decide to cover more topics or dive deep into one area, make sure to document everything well. Write about why you chose to add certain sections, how you approached them, your results, and your thoughts on why things worked or didn't work.

In-Person Delivery and Individual Assessment

- **Individual Effort Assessment**: The in-person delivery will be the primary venue for assessing individual contributions. This assessment will be graded as Acceptable, Barely Acceptable, or Unacceptable, with multipliers of 1.0, 0.75, and 0.5, respectively.
- **Purpose of Penalty Multipliers**: These multipliers are designed to address situations where an individual team member contributes minimally. It's important to note that these penalties apply to what the team has achieved; if a team's overall performance is not strong, members will not be subject to these penalties.

Resources and Learning Materials

We provide a comprehensive list of resources, including tutorials and documentation for tools like Galaxy, BLAST, and others relevant to the tasks. These resources are designed to support and enrich your learning experience.