

Last update: September 3, 2019

201-DDD-05 - Statistical Methods
COMPREHENSIVE PROJECT - PART 2

Part 2 is due Tuesday November 5, before 9:00am

CONTENTS

1	Part 2: Scientific Essay	2
2	Grading Scheme	3

1. PART 2: SCIENTIFIC ESSAY

“Our findings suggest a remarkable proposition: no matter the languages we speak or the colour of our skin, we share ancestors who planted rice on the banks of the Yangtze, who first domesticated horses on the steppes of the Ukraine, who hunted giant sloths in the forests of North and South America, and who laboured to build the Great Pyramid of Khufu.” (D. Rohde, S. Olson, J. Chang)

Research the topic of MRCA (most recent common ancestor). You may use the papers that are posted on Léa as well as any other source you might find (please cite all sources). Another source that is interesting to read is Chapter 0 (All Humankind) of the book “The Ancestor’s Tale: A Pilgrimage to the Dawn of Evolution” by Richard Dawkins.

Write an essay summarizing what you have learned about the MRCA, assuming the reader has a limited science background (a science DEC from 20 years ago) and knows very little about the topic. Your paper needs to seamlessly integrate the following topics.

- What is an MRCA? What about a matrilinear MRCA and a patrilinear MRCA? (In this project we will focus on two-parent MRCAs.)
- What is the TMRCA (time to most recent common ancestor)?
- Briefly talk about how TMRCA can be estimated using DNA tests.
- Explain thoroughly the mathematical model to study the TMRCA proposed by J. Chang in his paper “Recent common ancestors of all present-day individuals”.
- Talk about the limitations of that model and whether it is realistic or not.
- Briefly talk about more realistic approaches to estimating the TMRCA.

Guidelines for the submission of your essay:

- Your essay should be around 2000 words. Therefore, the essay should be at least 4 pages, but less than 8 pages. This depends on the font size, interline spacing, but also on the quantity and size of the figures you include.
- Come up with an interesting descriptive title for your paper!
- Remember to write your essay with the point of view of introducing the subject to an audience that has only very basic scientific knowledge.
- Your paper should be well-written, well-structured, fun to read, and informative. I’m expecting a high quality result, so make sure to review your essay multiple times to fix your grammar and tweak the presentation.
- Cite at least three serious academic sources (published journal articles). Websites like Wikipedia don’t count as serious, but you may still cite them. Format your citations and bibliography following the example of [Wikipedia](#). It is not enough to have a list of references at the end of your paper, you have to *cite* them in the text in relevant places.
- Hand in a hard copy of your essay (printed double-sided if you can). I will not accept electronic submissions.
- **BE AWARE** of the college policy on cheating and plagiarism! See the [IPESA](#).

This essay is worth 5% of your final grade. There will be a late penalty of 10% (0.5 points out of 5) for each day late.

2. GRADING SCHEME

Below is a tentative grading scheme for this part of the project.

PART 2	
Presentation (<i>readability, structure, clarity, etc.</i>)	2
Effort (<i>includes all elements required, reasonable effort was put in, doesn't feel rushed</i>)	1
Science (<i>Quality/quantity of scientific explanations</i>)	1
References (<i>relevance and quality of selected sources, format, appropriate citations in the text</i>)	1
TOTAL (Part 2)	5