Computational Methods in Genomics Projects

The project will involve research in bioinformatics. You are encouraged to work on a project related to your interests. You can pick a project from the topics we covered in class or work on any other topic related to bioinformatics. The key idea is to be creative, either in developing a new algorithm or in implementing an existing one, if you choose to work on a programming project. Results, whether good or bad, should be compared with those obtained from existing bioinformatics tools or packages.

The project implementation may be developed for any platform. You can use C, C++, C#, Java, Matlab, or Perl. The World Wide Web contains many bioinformatics programs as well as the source code. You may use and modify such code provided appropriate acknowledgements and citations are made.

The course webpage: http://www.cs.sjsu.edu/faculty/khuri/Aalto_2010 contains many interesting articles.

It is important to get started as early as possible.

The projects are due on Friday, September 24, 2010, at 1700.

A good project report will include the following:

- Background of the problem from the literature search.
- A clear definition of the problem.
- An explanation and justification of methods of data analysis.
- A description and justification of the data sources.
- Analysis of the results and comparison with existing tools.
- Conclusions based on the results.
- Possible directions for future research.
- Instructions on how to compile and execute your program, if applicable.
- A full list of references.

Guidelines for Programming Projects

Submission Requirements:

Please include references for any material you have used, including source code.

A) Submit a hard copy of the project containing all of the following:

1) Title page.

2) Table of contents (with page numbers).

3) An essay of not more than 6, 1 1/2 spaced pages (font size: 11 or 12 points) describing the problem, the overall organization, design of your program. The essay should include a detailed analysis of your results and comparison with the findings presented in the original article. Use MS Excel or a similar package to generate tables and graphs. The essay should give the user an overall roadmap of your code, and would be read by a maintenance programmer before he/she began reading your code. Please do not include definitions, explanations of topics we have covered in the course and do not simply copy the original article. Include a flowchart, or UML or a structure chart to show the design of your program. Do not forget to number pages!

4) A one-page description of the test data including accession numbers. You must test your program with the data sets described in the original articles. You may use additional data sets if you wish.

5) Include one sample output of your program. Make sure that your output is readable and well formatted.

6) Instructions for running your program, in other words, explain how to compile, and execute your program.

7) A list of references.

B) Submit a CD labeled with your names, course number and semester, and containing:

a) The source code (fully documented)

b) The input files

c) The document specified in part A

Please make sure that all the files on the CD are readable.

You may submit a USB key instead if you want to.

Guidelines for Non-Programming Projects

Submission Requirements:

Please include references for any material you have used.

A) Submit a hard copy of the project containing all of the following:

1) Title page.

2) Table of contents (with page numbers).

3) An essay of not more than 15, 1 1/2 spaced pages (font size: 11 or 12 points). The essay should include a detailed description of the problem, materials and methods used by the authors, and a short summary of the results presented in the original articles. Please do not include definitions, explanations of topics we have covered in the course and do not simply copy the original articles. The largest part of your report should consist of the methods and tools you used to perform the bioinformatics analyses, a discussion of your findings and the comparison with those obtained by the authors. Use MS Excel or a similar package to generate tables and graphs. Include screen dumps were appropriate. Do not forget to number pages!

4) A one-page description of the test data including accession numbers. You must perform the analysis with the data sets described in the original articles. You may use additional data sets if you wish.

5) A list of references.

6) Additional articles (in pdf) used in your project.