Goals:

- To practice modeling a vaguely realistic situation, which might have practical implications, yet is not a routine problem.
- To practice working with another “open ended” problem for which there may not be a simple numerical answer.
- To practice communicating and explaining mathematical results clearly and professionally.
- To further practice working in a team on a mathematical problem.

Your group operates an employment counseling firm. A new client has just written to you with an unusual problem. The client has accepted a job at a large company known for its unusual personnel policies. Within a few weeks, your client must choose from three payment options for the job. The choice is permanent and cannot be changed while the client is with the company.

The salary choices are:

1) $1,000 per month for the first month, with a $250 raise every month,
2) $400 per month for the first month, with a 4% raise every month, or
3) $(3000 + 440t - 4t^2) for the t^{th} month on the job.

Write a detailed evaluation of the three salary options that will help your client choose. You should include several recommendations, contingent on the client’s financial background, or any other relevant factors, since you do not know that background. Both long-term and short-term considerations should be addressed. You should be both practical and yet imaginative in considering the criteria you work with in making your recommendations; try to include appropriate issues even if they are not explicitly requested here.

Your report should focus primarily on the mathematical aspects of this decision. Practical matters that have no quantitative aspect should be discussed briefly if at all – but do include any quantitative aspects that may be of practical importance. The conclusions may take many forms and need to be explained in detail through the use of words, numbers, formulas, diagrams, and/or graphs. If there are questions that arise which you do not yet have the mathematical knowledge to answer, you should consult with Prof. Janeba and outline those questions in your report, even if you cannot provide answers. Providing these good additional questions can be a real bonus for your report.

Because your client is paying for this report, and because your counseling firm is new and needs all the positive word-of-mouth advertising it can get, your report will be professionally prepared. This means that the report will of course be neatly presented with whatever tables and graphs are helpful to clarify your points. Great care will be taken in explaining complicated points clearly; you may assume your client has a mathematical background similar to yours. Grammar and spelling will of course be excellent. Use plain paper and a staple; add fancy stuff only when it makes your recommendations clearer or easier to understand. Formulas and equations will be typed, using for example the Equation Editor built into Word. Well-labeled graphs that help with your report’s clarity are encouraged; they may be (very carefully!) hand-drawn or produced by computer, e.g. by Microsoft Excel. On the front page, team member’s names will be clearly visible.
Submit a preliminary report on your evaluation of the salary options, and on your group’s progress so far, by 4:00 p.m. Friday, November 14, at your client’s attorney’s office, Ford 216.

The preliminary report will be a formal report that shows a substantial start on the project and outlines how your group will approach the remainder. Both reports will be self-contained, i.e. the reader must not need prior knowledge or understanding of the problem to understand your reports. It is assumed that this preliminary report will be the foundation of your completed paper.

Present your final report on Wednesday, November 19, by 4:00 p.m. at your client’s attorney’s office, Ford 216. Anything shoved under the door after the office closes at 4 p.m. will be considered too late and won’t be accepted. You will also submit an electronic version of your report to your instructor via email.

You will want to have an essentially final draft done two to three days in advance so that you can review and revise as necessary.

Your report will be evaluated for its clarity, completeness, correctness, and initiative. More detailed grading information is available in the project grading rubric on the course handouts webpage.

Group evaluation: Your group turns in one report and everyone in the group gets the same grade. To provide some accountability, however, every group member is required to submit to their instructor an informal group evaluation. Handwritten, typed, or email are OK. The evaluation should include (just!) a few sentences about how well the group worked together. The evaluation must include your estimate of the percentage of the project work that you feel each group member did (e.g. 33%/33%/33% or 40%/35%/35%, etc.). These percentages must add to 100%. These evaluations will be held in confidence, and used at the end of the semester, if necessary, to adjust final grades.

[This report is worth about 5% of your class grade.]