

### General Turn-in Instruction

To complete this homework set, you are required to do the followings. Your work must be typed in L<sup>A</sup>T<sub>E</sub>X using the course work statement template. The progression of your work statement revision is to be “recorded” by making a git folder specifically for this revision homework set. The burden of proof is on you, and if your git commit history is sparse, then you may be liable for a penalty. A paper copy of the PDF output of your L<sup>A</sup>T<sub>E</sub>X file is to be submitted to your instructor in class on the due date. The *original* marked copy of your first draft *must* be attached at the end of your *final* draft. Should you want to keep a record of the marked copy, please make a photocopy of the original marked draft for your reference. *After* submitting the paper copy, but *before* the end of the due date, you will upload your work to your github by making a remote repository specifically for the homework, and post the link to the repository at the designated *Discussion* forum in Blackboard by making a thread just for you. The repository name in your github should be `550400.workstatement.final` and the discussion forum thread should be named `YourFirstNameMiddleInitialLastName`, e.g., `BaracHObama` and `WillardMRomney`. You have till the end of the due date to finalize your github repository. However, any commit made after the class time of the due date will be inadmissible. *Your attention to details in following this instruction will be critical, and if not followed exactly at the time of collection, the homework set may be graded at 90% of the full score.*

### Checklist for Revision

- Make sure that your *exogenous* and *endogenous* variables are introduced in your *Problem Statement* section. Do not refer anything directly as exogenous and endogenous, but anyone who knows those technical words, *should be able to* pick them out by reading *Problem Statement* section. See Chapter 1 of [1] for review of these terminologies.
- Give appropriate credits to the publications that you are relying on. Use the BibTeX. For examples of a bibtex entry, see the file `bibliowS.bib` and for necessary L<sup>A</sup>T<sub>E</sub>X codes needed in your workstatement L<sup>A</sup>T<sub>E</sub>X file, see the very end of `workstatement.tex` in the course repository. The following webpage gives a nice tutorial on BibTeX:

[http://en.wikibooks.org/wiki/LaTeX/Bibliography\\_Management](http://en.wikibooks.org/wiki/LaTeX/Bibliography_Management)

- In your *Deliverable* section, if your project needs data/required assumptions/equipments from your sponsoring organization, then make sure that you specify the due date for the sponsor to deliver them, and specify your contingency plan should they fail to meet the deadline.
- Do not leave any technical term unexplained. For the guideline, see the text between Page 20 and Page 25 in [2].
- Explain your data and (proposed) method in *Approach* section. For the guideline, see Chapter 12 in [2].

- For each figure or table in the work statement, make sure to have a caption that addresses all four Ws (i.e., Who, What, When and Where). See the text between Page 13 and page 15 in Chapter 2 of [2].
- Do not be colloquial in your text. Assume that your audience is a mixture of both statistically trained readers and professionals who are interested primarily in the answers rather than the technical details. For some guideline, see the text between Page 380 and Page 385 in Chapter 16 of [2].

## Summary of Lectures\*

**Introduction** Your *Work Statement* is a key document that sets forth your understanding of your research project at the start of the consultation work, and it is important that you prepare it well. The initial draft will be written by your team, then negotiated (and possibly modified by you in negotiation) with your *sponsor*<sup>†</sup>. When you have completed your Work Statement in its final form and submitted it to your sponsor, it may be negotiated and modified. But once agreed upon, your Work Statement will serve as the foundation for your project.

But we all know that research is unpredictable, so you will want to allow for contingency and be reasonable in your negotiation. This note describes the content and structure of a Work Statement, and offers suggestions for preparing the Work Statement and discussing it with your sponsor.

**The Work Statement** The Work Statement (referred to in government contracts as SOW or Statement of Work) will be your team's commitment to the sponsor for work agreed to. In the reverse direction, it will include a statement of what, if anything, you will receive from the sponsor, such as software, data, hardware, or written materials, and it will serve as a commitment by the sponsor not to demand more than is agreed to.

The Work Statement is an important contract between your team and the sponsor, so it is important to prepare well and conduct your negotiations carefully. Never use in your Work Statement technical terms that you do not understand; otherwise you may discover too late that you promised to do the impossible. Make sure you understand your Work Statement very well before signing off on it.

A project Work Statement needn't be long; five to six pages would be long. You just need to spell out what your team agrees to do and, in turn, what you need to receive from the sponsor and when you need to receive it, in order to get the work done.

Usually, these will include things like the following.

- Problem statement
- Background
- Goal of your project (major direction you see the work aimed at, not necessarily what you bid to do)
- Objectives (specific aims of your project, and schedule of results you expect to achieve)

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\*The most of these materials are from [3].

<sup>†</sup>The term sponsor in this document refers to either your sponsoring organization or a person empowered to make agreements on behalf of your sponsoring organization, depending on context. Be sure to ascertain who can serve in that role.

- Tasks (the things you will do to achieve your objectives) and a list of items required from your sponsor in order to perform your tasks
- Milestones (major checkpoints your team will use to stay on track)
- Deliverables (specific work products you will deliver to the sponsor)
- Schedule (dates for completing milestones and tasks and for deliverables)

Your Work Statement need not use the terms introduced above, but it should address the major points they refer to. And your Work Statement need not be as fine-grained as what is implied by the terminology. For example, your team might set internal milestones as a way of maintaining pace and coordination but not include them, or include fewer of them, in the Work Statement. The Work Statement is like a recipe – getting the right ingredients and the right amount of each ingredient is an art.

If your project does require the sponsor to provide something of importance, be sure you include it in your Work Statement and specify a last acceptable date for delivery of the material and contingency plans that will allow you to proceed in the event of a failed delivery. Note that this can include, for example, consultation to be provided by the sponsor on the use of special equipment or software.

If your sponsor demands more than you think you can commit to doing, try using phrases like, “time permitting, we will attempt to do X”, or “if our research leads successfully to A, we will then proceed to investigating B.” Statements like this show that you are aware of where your sponsor wants to go and that you are committed to trying to get there, but it also serves as fair notice that you believe the sponsor may be asking too much to insist on B.

Your Work Statement is not just for experts. It will be of interest to several parties of differing backgrounds and knowledge, not only to your sponsors mentor and yourselves. For example, the manager(s) who funded your project will need to understand what they paid for and be able to justify the expenditure to their management. If your work is successful and generates interest in implementing the results by the sponsor or in continuing the line of research, managers will be tapped again for funds, and a later project team, who are not necessarily experts at the outset, will need to use your documentation to come up to speed. A clearly written Work Statement, along with your final report, can be used by them as their starting points.

## References

- [1] E. Bender. *An Introduction to Mathematical Modeling*. Dover Publications, 1978. [1](#)
- [2] J. Miller. *The Chicago Guide to Writing about Multivariate Analysis*. The University of Chicago Press, 2005. [1](#), [2](#)
- [3] M. Raugh. *UCLA IPAM RIPS Manual*, 2012. [2](#)