**I. Title and Team,**

The title of my project is “Nature of ‘semantic’ Bugs.” I, Seungtack Baek (sxb085000), will study this topic myself.

**II. Problem Statement**

Through this research, I am trying to come up with new taxonomy of semantic bugs. According to Yin et al., there are 3 types of bugs: concurrency bugs, memory bugs and semantic bugs. However, this word semantic is very vague not really informative. If a maintainer were to fix concurrency or memory bugs, they will at least focus on specific element of code, such as locks or memory operations. However, if they were to encounter semantic bugs, they will have no idea on what element to focus on, or even worse, even where to start to look at. However, if the semantic bugs can be categorized further into more informative classes, it will possibly decrease the time it takes to debugs such bugs.

**III. Approach**

Through this study of semantic bugs, I aim to classify these bugs even further so it will be somewhat more informative, yet useful in debugging process. The approach to obtains sample semantic bugs will be almost identical to the approach Yin et al. took. Using linking, I will extract bugs from open projects, such as FreeBSD, Linux and OpenSolaris, and take only semantic bugs (non-concurrency and non-memory bugs).

The major novelty of this research comes after obtaining the semantic bug samples: further classification of semantic bugs. I will identify the cause and effect of each bug and try to group bugs of similar kind.

**IV. Evaluation**

For this specific project, existence of further classification in semantic bugs will be the result. And, whether I can come up with new taxonomy for semantic bugs will be evaluated throughout this project.

**V. Concrete Tasks**

The following list contains concrete task to be carried out for this research:

1. Gather 3 open source projects that Yin et al. used, along with their debugging history.
2. Go through each bug (possibly determine the length of development period.) and classify as Concurrency, Memory and Semantic.
3. Now, filter out non-semantic bugs and take only semantic bugs.
4. Of those semantic bugs, analyze the cause and effect of the bug.
5. According to their cause and effect, further break down semantic bugs and possibly come up with new classification.