EXPERIMENT Report

# EXPERIMENT

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| Report Date | Project Name | Prepared By |
| 17/09/2019 | Discrete Biostatistics | Tommy Meek |

# QUESTION: What do we want to figure out?

How to create an ArmitageDoll program that will supply the Power Law coefficients for an exponential function modeling our experiment.

# PROCESS: WHAT WILL WE DO TO ANSWER THE QUESTION?

Write four functions in the R language that each perform one step of the program.

# RESULTS: WHAT HAPPENED IN THE PROCESS?

Justin and I had trouble adapting to the R language. We are used to using loops for repetition in coding so R’s functional approach using vectors is foreign to us. While writing the hitting\_time function, we had to figure out the proper way to implement an exponential function in R. We researched this and figured out that rexp() was the answer. For the population\_sim function, we struggled to find how to repeatedly append a vector, with or without a loop. The replicate() function worked in the end. Dr. Penland recommended that for the censor function, we use a histogram to get the bins. This worked well, though it still took work to figure out how to get rid of the zero rows and to restrict the ages to <= 80. The final function was log\_log\_fit. This one took a little math to wrap my head around what we were supposed to be returning. If I can’t conceptualize a process, it makes it much more difficult. After we got everything working, we ran some simple preliminary tests to ensure we got something reasonable. So far it seems to work but further testing will be necessary to verify this.

# Conclusions : WHAT DID WE LEARN?

Justin and I learned much about R. Coming from an Object Oriented background, R is an odd language. Using built in functions that iterate through vectors instead of loops is something that will take getting used to, but we are making progress. Justin’s knowledge of statistics for the most part exceeds mine so I have been relying on him to explain to me some of the work with linear regression and other things.

# CONJECTURES & FUTURE QUESTIONS: WHAT COMES NEXT?

* Our code needs to be tested further. Fully implementing unit testing is probably best.
* After that, figuring out how to best visualize the data would be a good place to go.

# DOCUMENTATION: WHERE CAN WE SEE THE RESULTS?

Dr. Penland has a copy of the R file we created.