Sequential Methodology for Kernel Regression
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Sequential Methodology and Kernel Regression were completely new topics for me, so the first week of my Summer Research Scholarship involved one-on-one lectures with my supervisor A/Prof Basil de Silva in both these topics. Next I created two sequential procedures using S-Plus to estimate the sample size n for fixed width confidence intervals the "Purely Sequential Procedure" and "Steins Two Stage Procedure". Then I compared these procedures using a basic example.

The second part of my project was Kernel Regression which is quite different to that of the "Least Squares Method" because in Kernel Regression we are estimating the function **not** the parameters. I used the "Nadaraya-Watson Kernel Regression Estimate" to estimate a non-linear example by varying r (The bandwidth is a function of r and n where $0<r<1$) and found my results were very good.

Lastly was the Application of Sequential Methodology to Kernel Regression. There are several properties of the "Nadaraya-Watson Kernel Regression Estimate" and under these properties we can get a formula for the expected value and variance of this estimate. I then derived n which is a function of d (fixed width of confidence interval) and r, which gives us our new "stopping rule" for our sequential procedures.

My honours thesis will be based around the Application of Sequential Methodology for Kernel Regression using this new "stopping rule" for both sequential procedures for different examples. This Scholarship was a great way for me to get a head start on my honours thesis and get paid at the same time! The conference itself was fantastic I got to socialise with other honours students in my field and see their presentations. Lots of their topics were new to me and that helped me to decide what honours subjects to undertake this year. I highly recommend this scholarship, particularly for those planning to do honours or further research.