Historical Attendance Data for the First United Methodist Church (FUMC) of LaGrange, Georgia for the Years 2006 to 2008 and Modeling the Data Using Back-Propagation Neural Networks (BPNNs) by James Pate Williams, Jr., BA, BS, Master of Software Engineering and Doctor of Philosophy in Computer Science

Back in the year 2009 or 2010, I become interested in modeling FUMC's attendance data using various techniques including BPNNs [1]. I obtained the attendance data for the four church services including Sunday School, Early, Morning Glory, and Traditional for the years 2006 to 2008. First is the attendance data and model for Sunday School in years 2006 to 2008, then Early Service, Morning Glory (Modern) Service, and the Traditional Service. Finally I have included statistics for the four services.

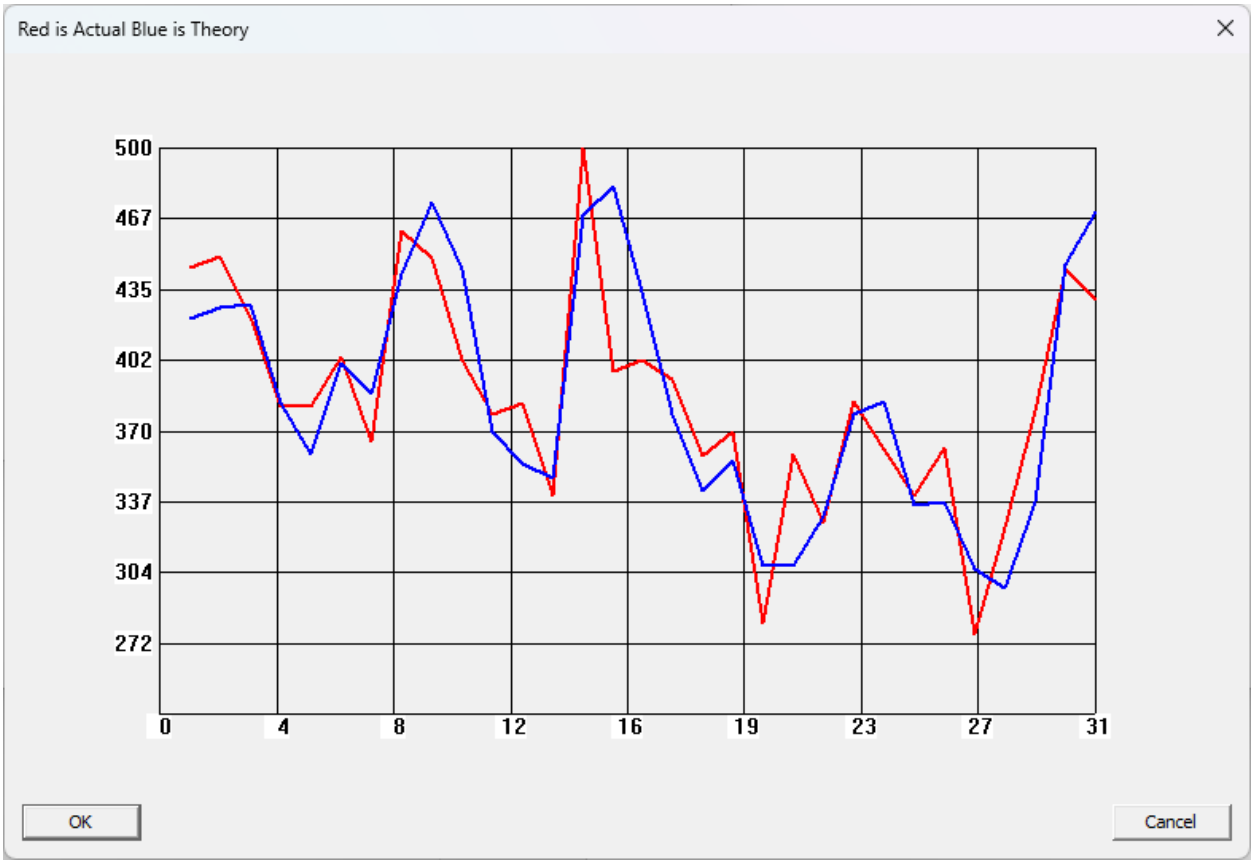

Figure 1 Sunday School 2006 Red is Actual, Blue is Theory

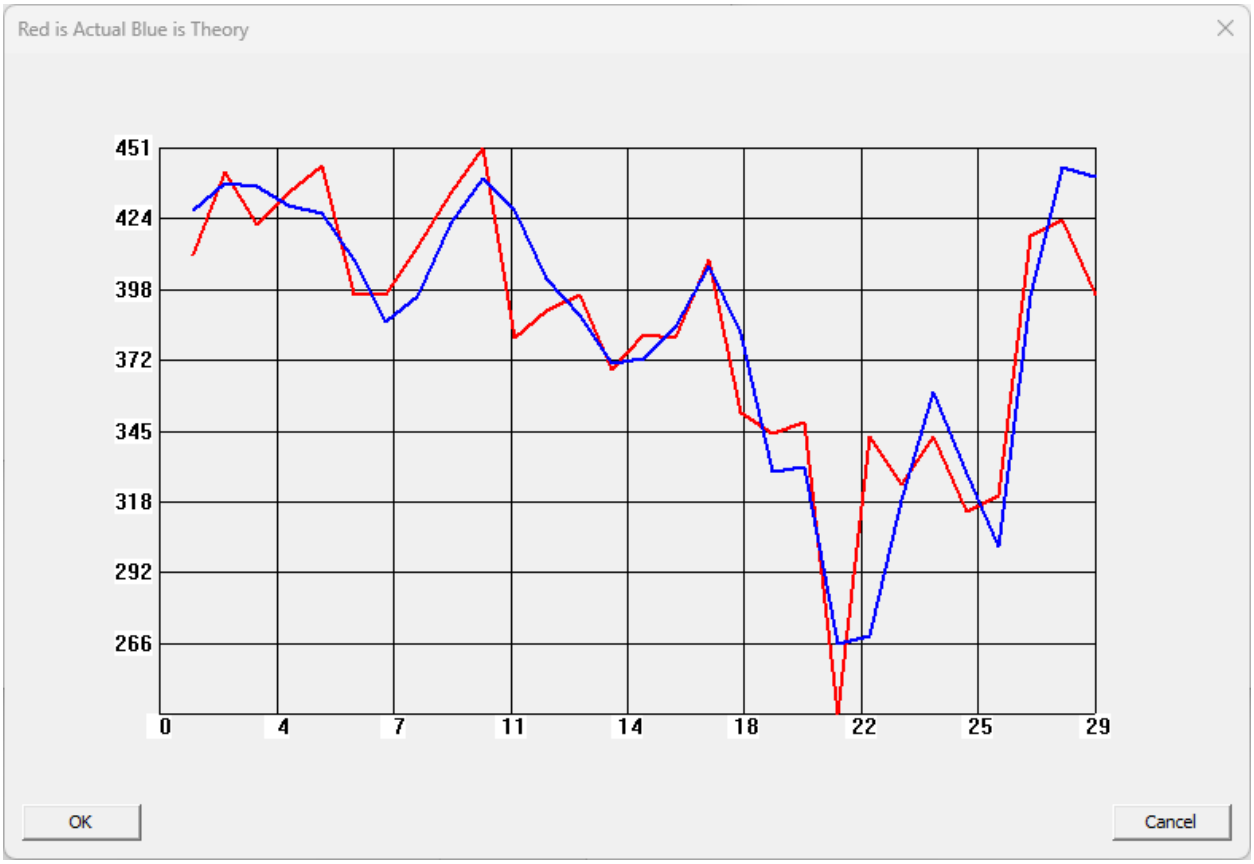

Figure 2 Sunday School 2007 Red is Actual, Blue is Theory

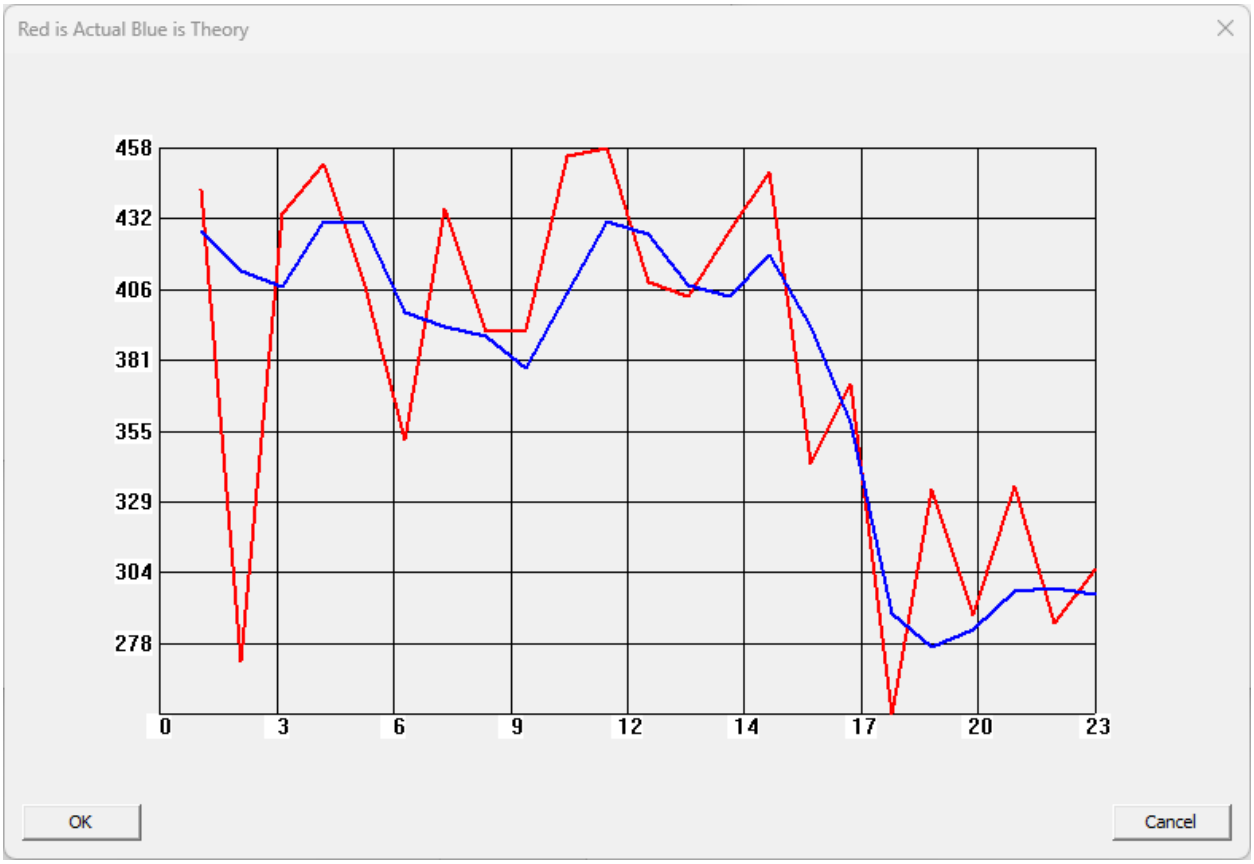

Figure 3 Sunday School 2008 Red is Actual, Blue is Theory

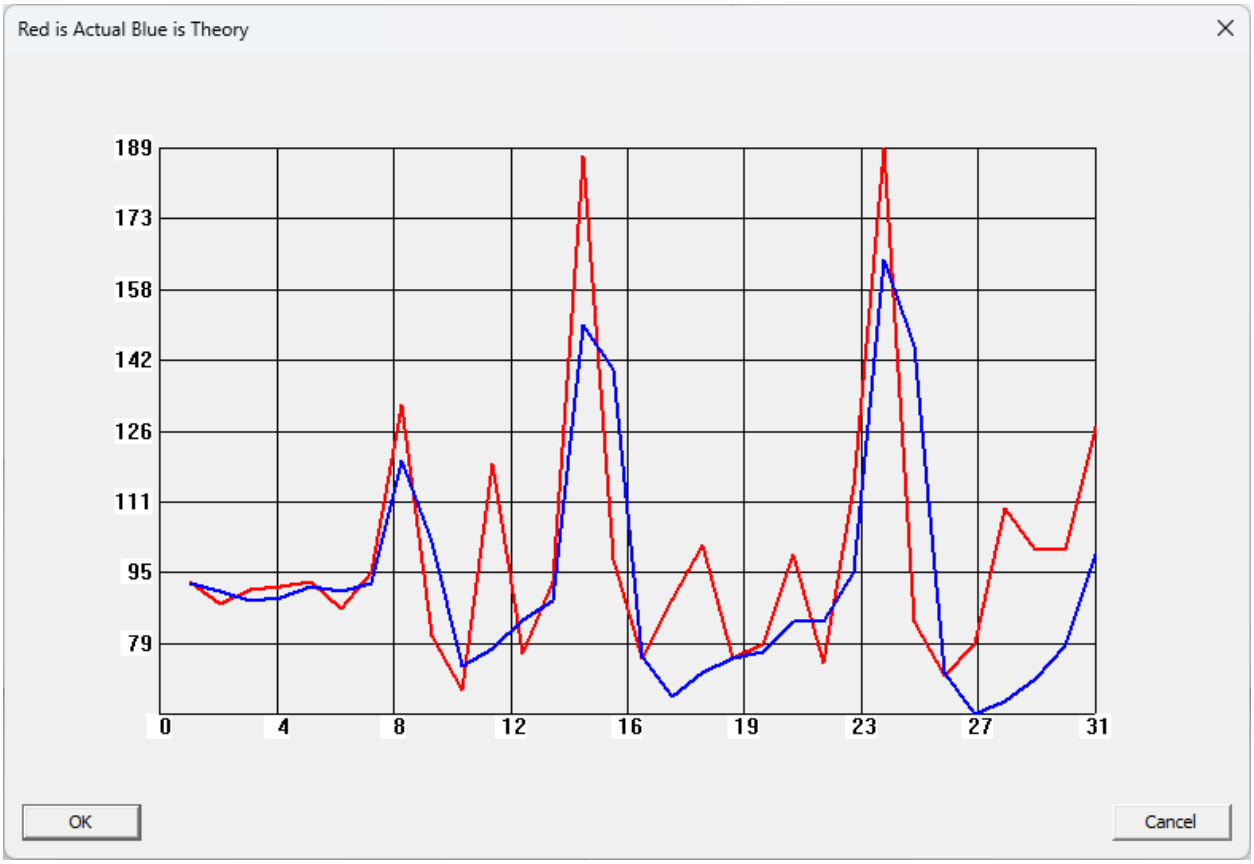

Figure 4 Early Service 2006 Red is Actual, Blue is Theory

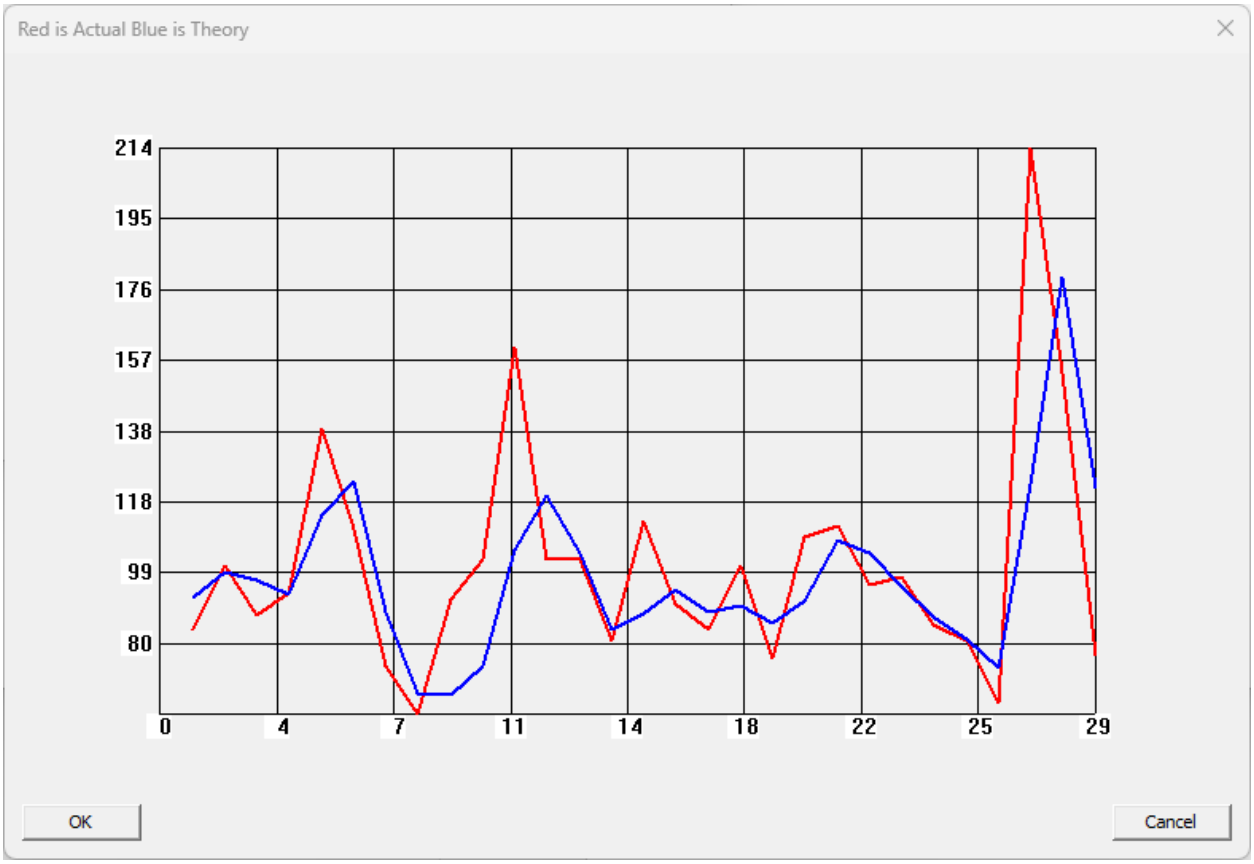

Figure 5 Early Service 2007 Red is Actual, Blue is Theory

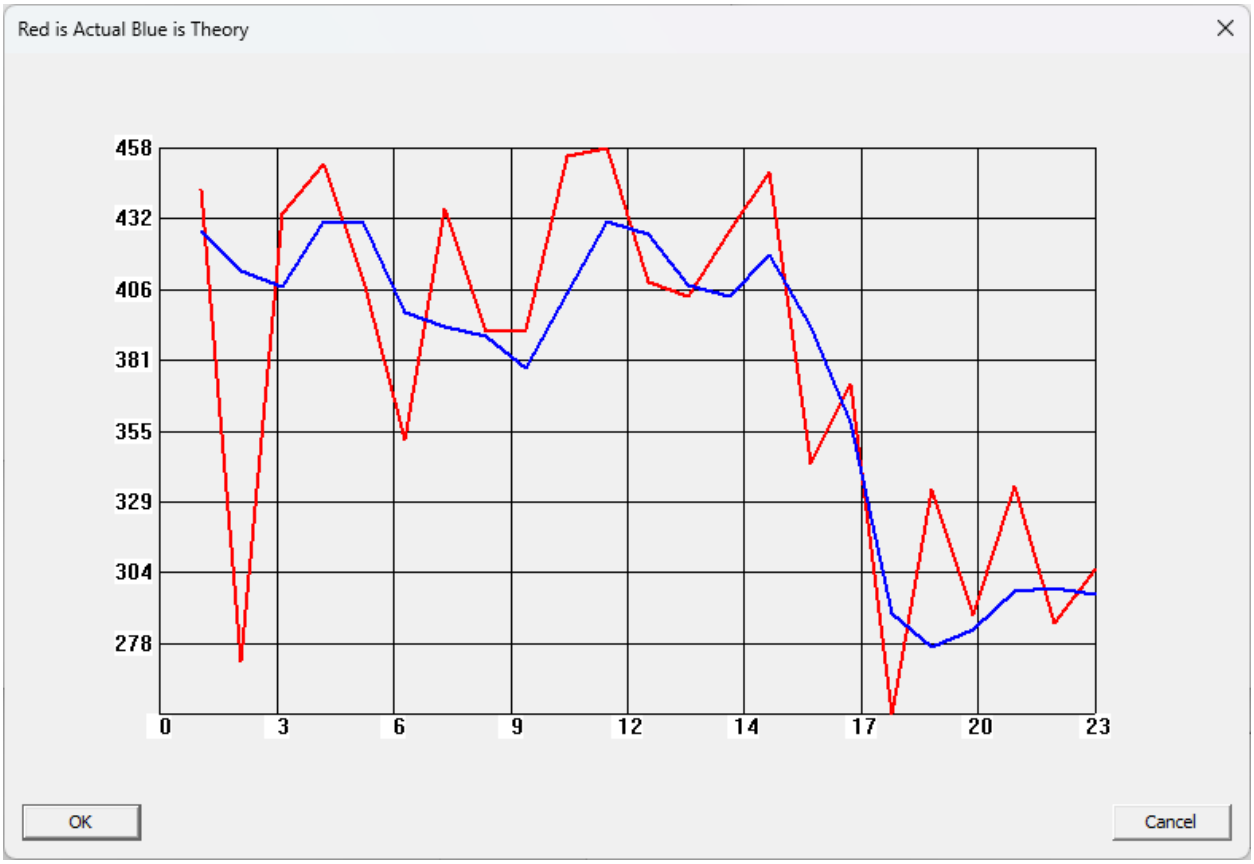

Figure 6 Early Service 2008 Red is Actual, Blue is Theory

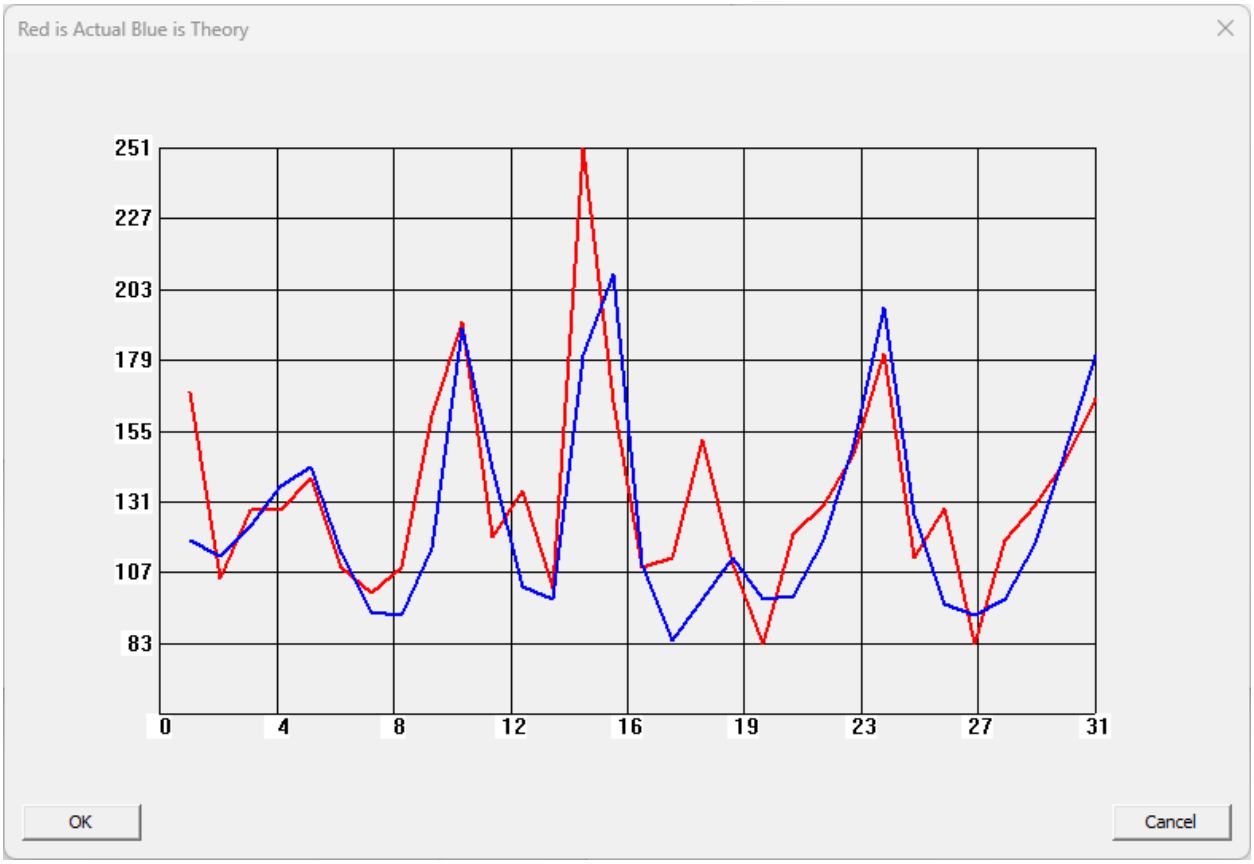

Figure 7 Morning Glory Service 2006 Red is Actual, Blue is Theory

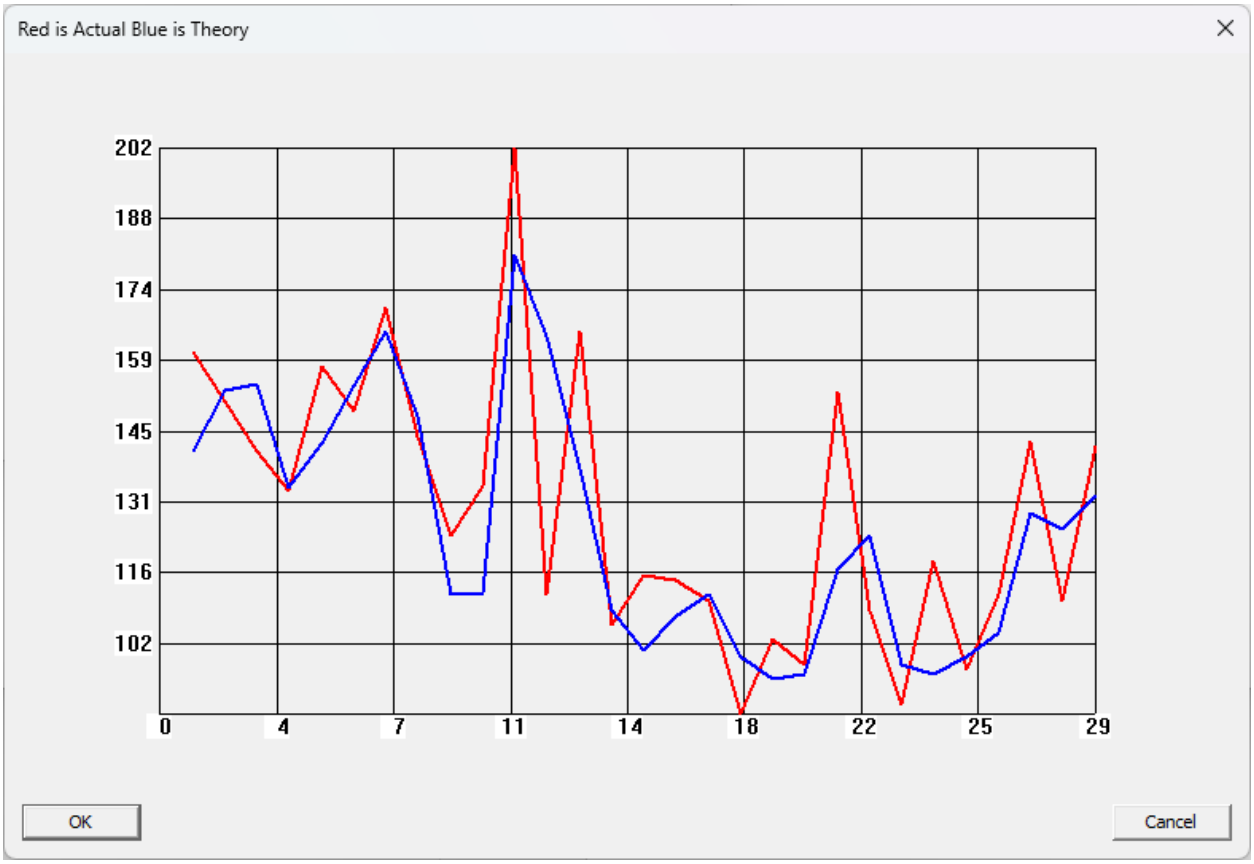

Figure 8 Morning Glory Service 2007 Red is Actual, Blue is Theory

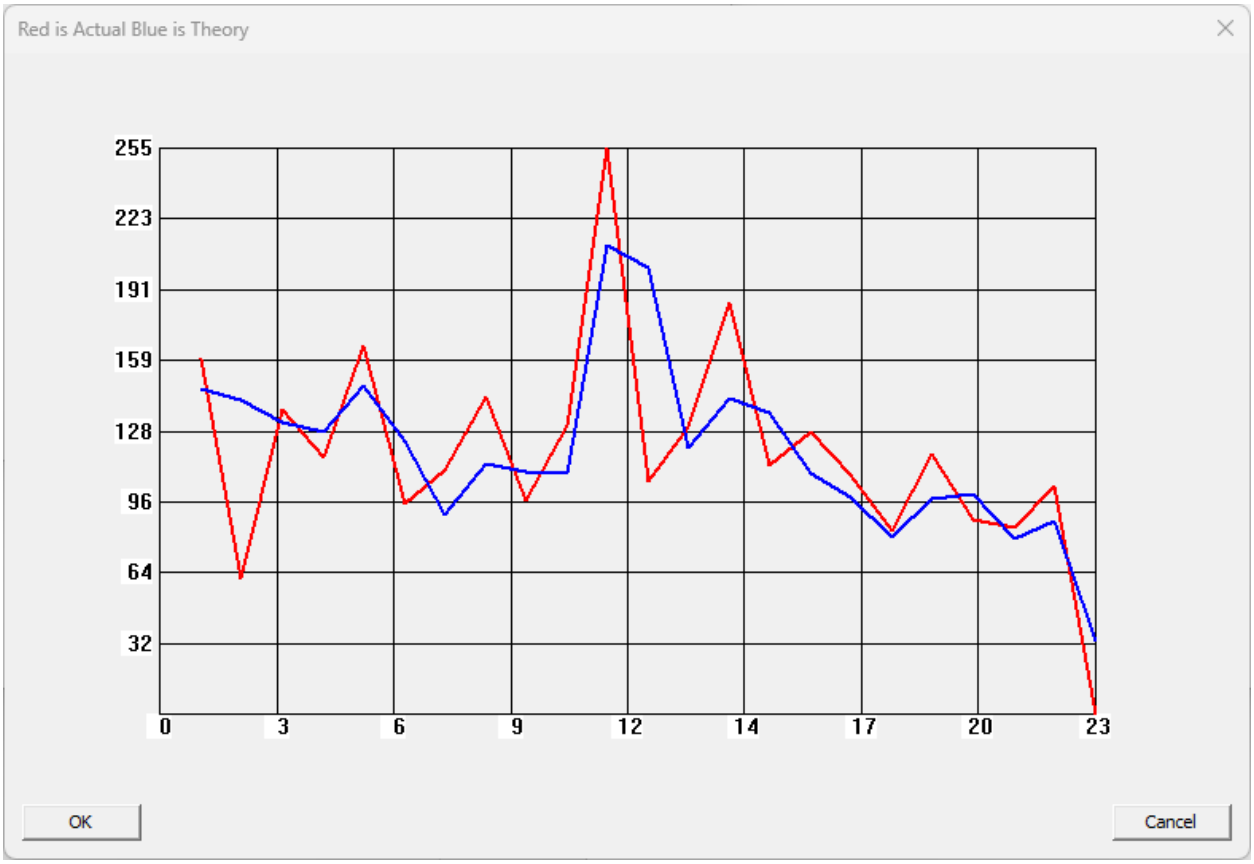

Figure 9 Morning Glory Service 2008 Red is Actual, Blue is Theory

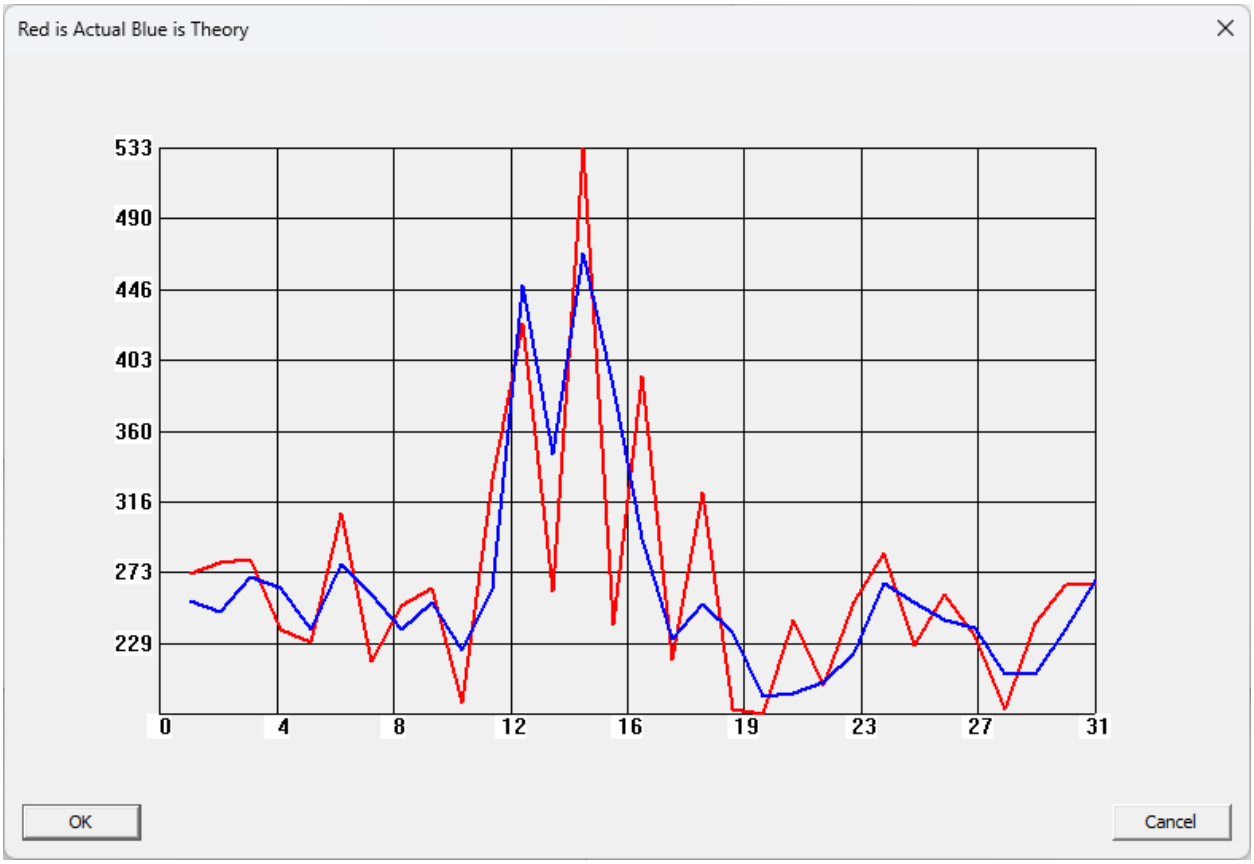

Figure 10 Traditional Service 2006 Red is Actual, Blue is Theory

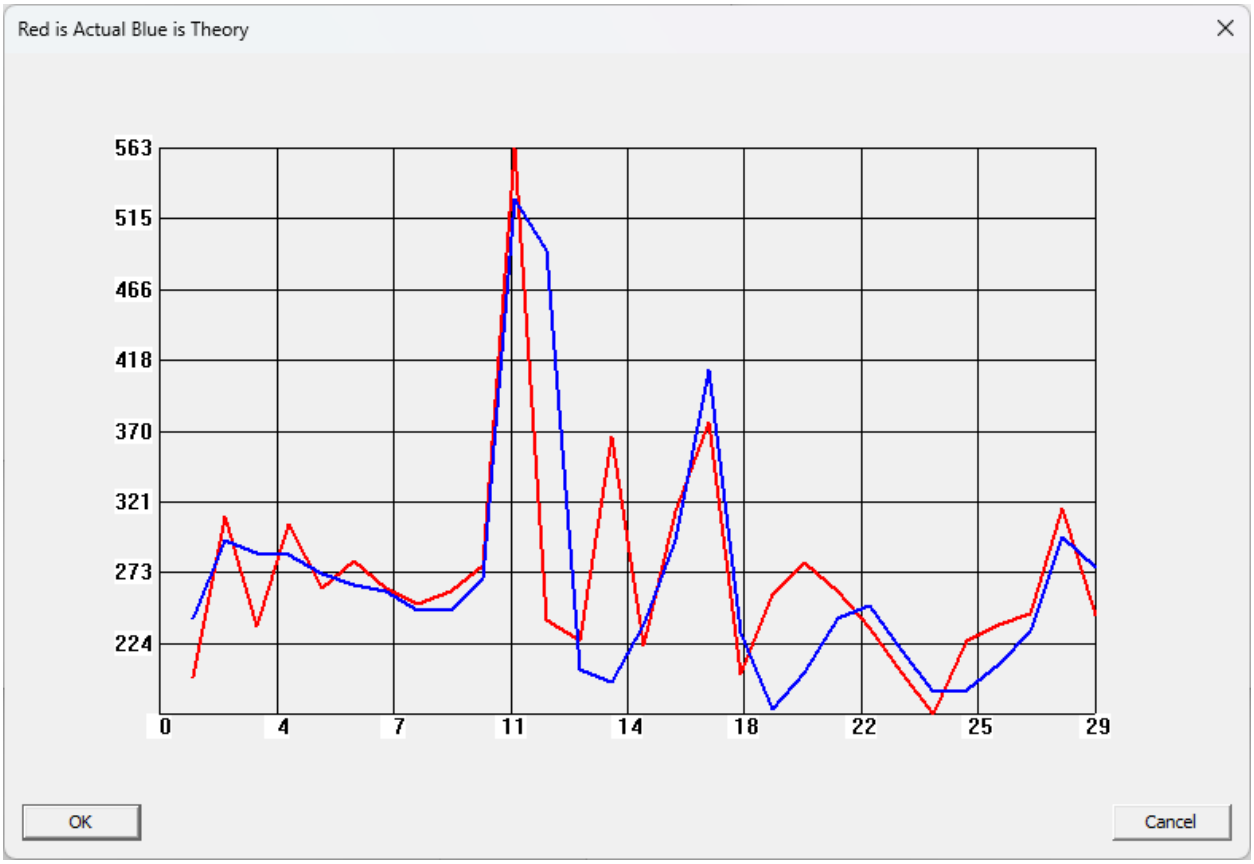

Figure 11 Traditional Service 2007 Red is Actual, Blue is Theory

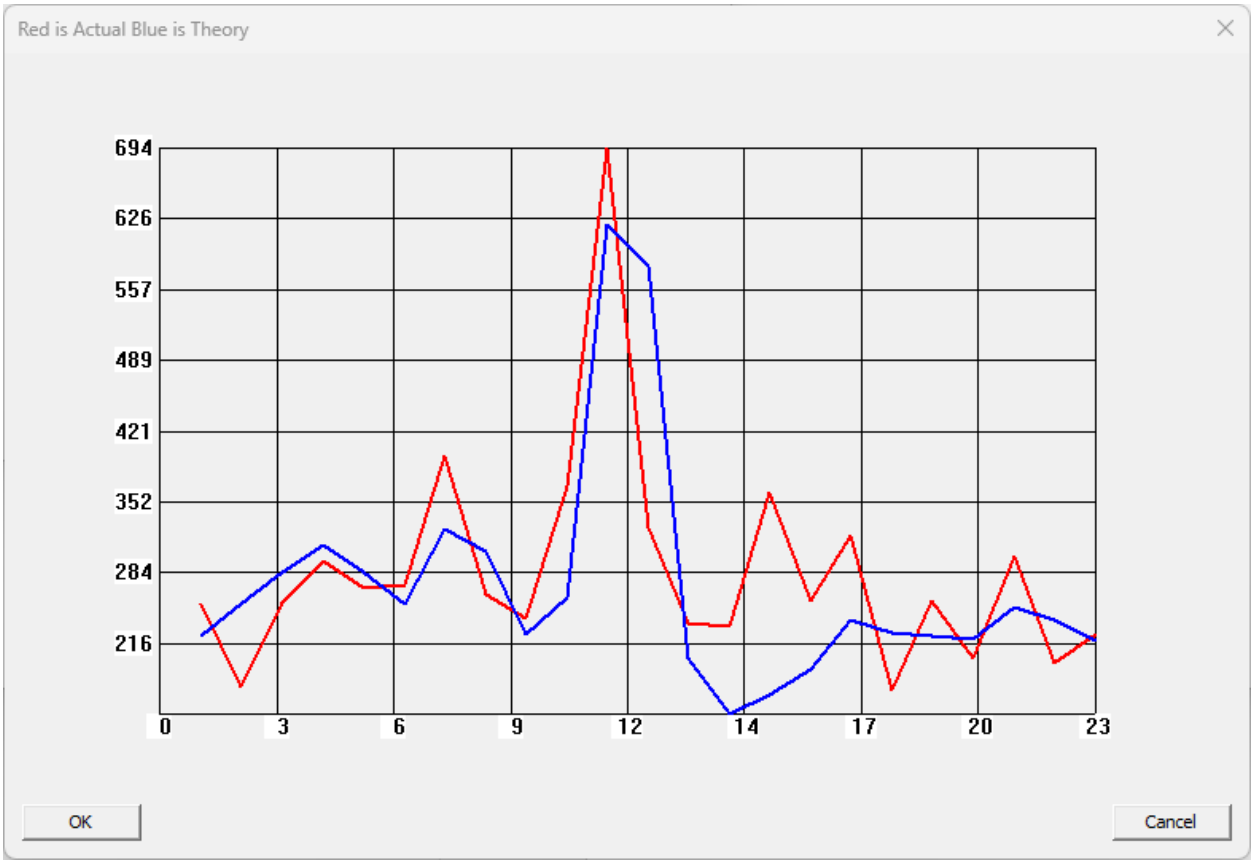

Figure 12 Traditional Service 2008 Red is Actual, Blue is Theory

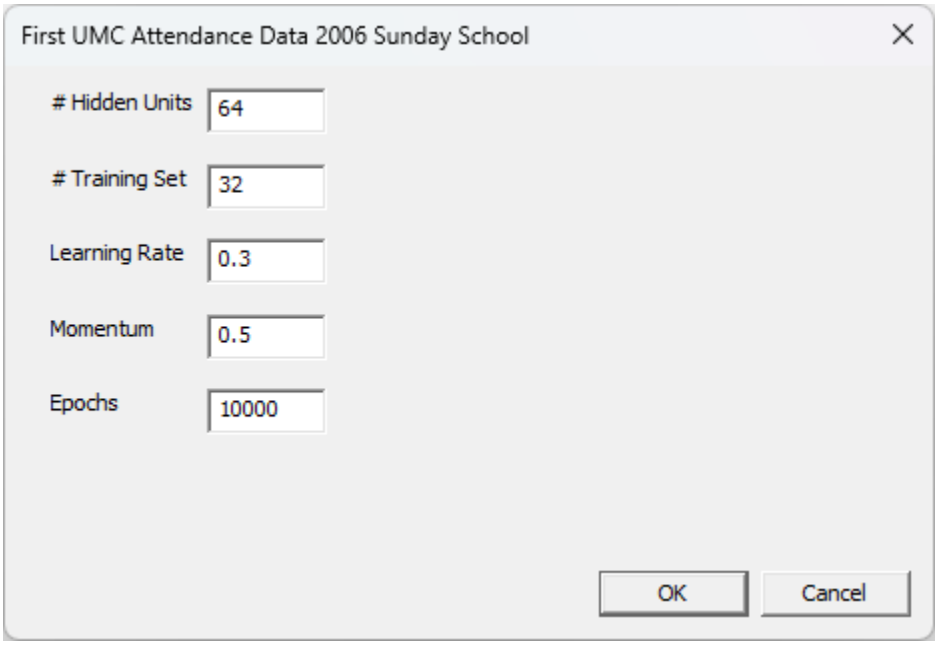

Figure 13 Typical Data Input Dialog

Year	Avg	Max
2006	373	500
2007	352	451
2008	361	458

Table 1 Sunday School Statistics

Year	Avg	Max
2006	94	189
2007	98	214
2008	84	197

Table 2 Early Service Statistics

Year	Avg	Max
2006	126	251
2007	147	400
2008	116	255

Table 3 Morning Glory Service Statistics

Year	Avg	Max
2006	257	533
2007	263	563
2008	264	694

Table 4 Traditional Service Statistics

References

[1] T. M. Mitchell, "Section 4.5 Multilayer Networks and the Backpropagation Algorithm," in *Machine Learning*, New York, The McGraw-Hill Companies, 1997, pp. 95-101.

Figure 1Sunday School 2006 Red is Actual, Blue is Theory 1
Figure 2 Sunday School 2007 Red is Actual, Blue is Theory 2
Figure 3 Sunday School 2008 Red is Actual, Blue is Theory 3
Figure 4 Early Service 2006 Red is Actual, Blue is Theory 4
Figure 5 Early Service 2007 Red is Actual, Blue is Theory..... 5
Figure 6 Early Service 2008 Red is Actual, Blue is Theory 6
Figure 7 Morning Glory Service 2006 Red is Actual, Blue is Theory 7

Figure 8 Morning Glory Service 2007 Red is Actual, Blue is Theory 8
Figure 9 Morning Glory Service 2008 Red is Actual, Blue is Theory 9
Figure 10 Traditional Service 2006 Red is Actual, Blue is Theory 10
Figure 11 Traditional Service 2007 Red is Actual, Blue is Theory 11
Figure 12 Traditional Service 2008 Red is Actual, Blue is Theory 12
Figure 13 Typical Data Input Dialog 12