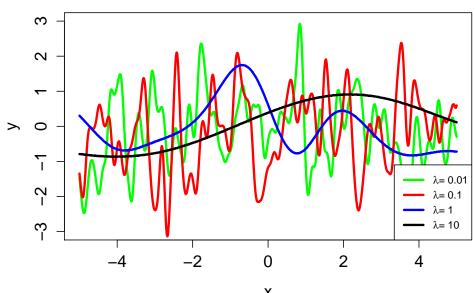
CS6957: Probabilistic Modeling

Homework 4

1. NOTE: Please see program p1.r for this question.

Gaussian process samples



 ${\sf X}$ Figure 1: Gaussian process regression functions for different λ values

2 NOTE: Please see program p2.r for this question.

95% Posterior Predictive Interval

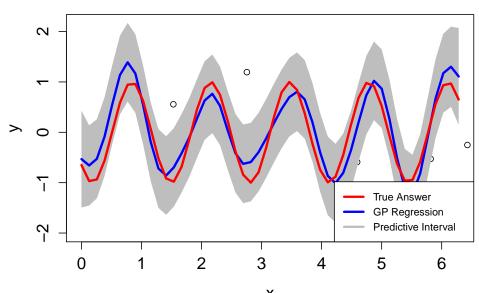


Figure 2: GP regression and true values plotted. $\lambda=1.5$

3 NOTE: Please see program p3.r for this question.

Average temperature trajectory

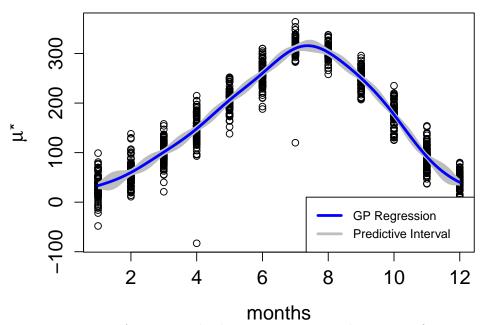
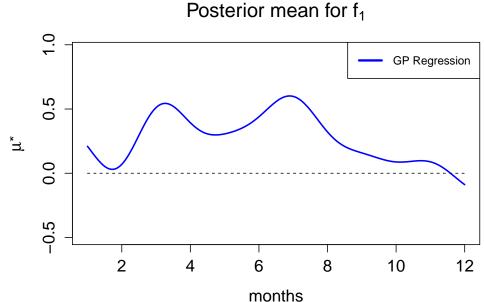


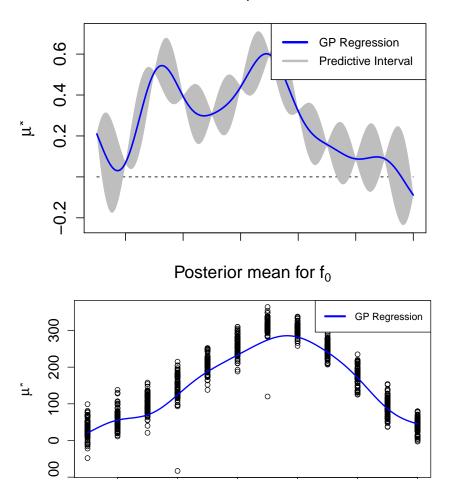
Figure 3: Average cyclical temperature over the course of a year



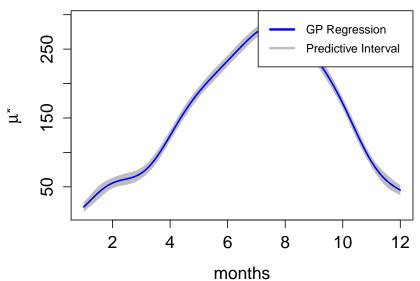
months Figure 4: Posterior mean for f_1 plotted over every month. Blue line shows the estimated posterior distribution

Fig. 4 shows the rate of change of average daily maximum temperature for every month. The graph shows that temperatures have increased over all the months, except for December. This shows that temperatures in SLC have increased on average over the years.

Posterior mean for f₁ with 95% confidence



Posterior mean for f₀ with 95% confidence



months
Figure 5: Posterior mean for $f_1(\text{top})$ and $f_0(\text{center,bottom})$ plotted over every month. Blue line shows the estimated posterior distribution, grey shows the 95% confidence interval.