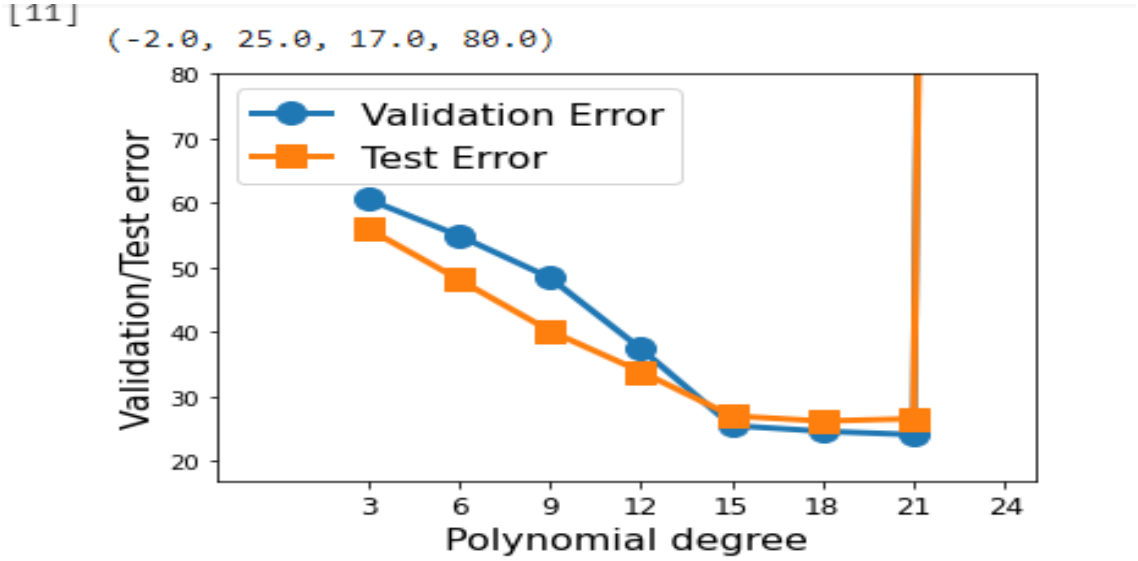
Assignment 1 Report

Part1 D.

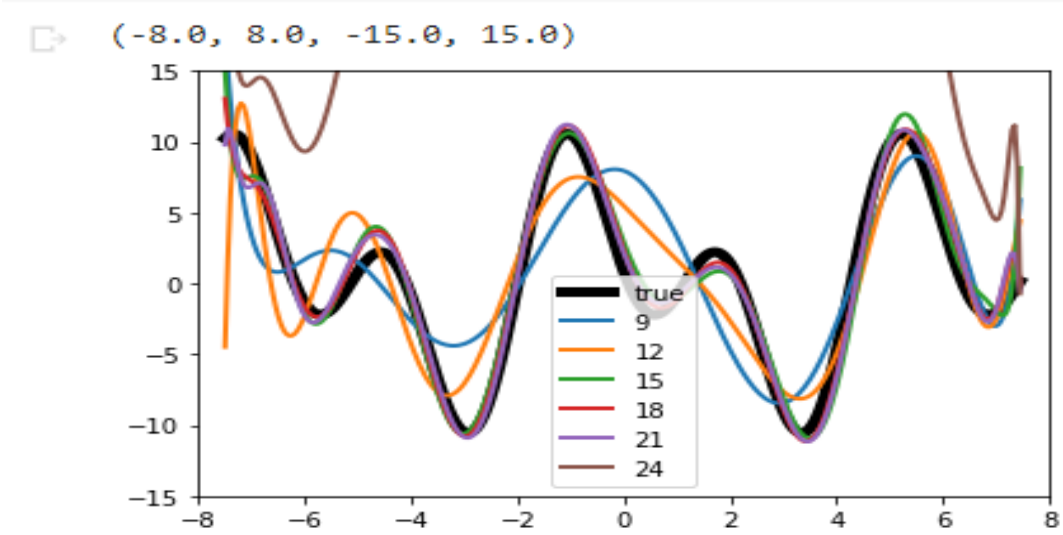
From plot of d vs. validation error below, which choice of d do you expect will generalize best?

By observing Polynomial degree vs. validation plot, the validation error and test error are minimized when D = 15, in this case, I would expect when d = 15, the function will generalize the best result.

Polynomial degree vs. Validation Plot



Visualization of learned model

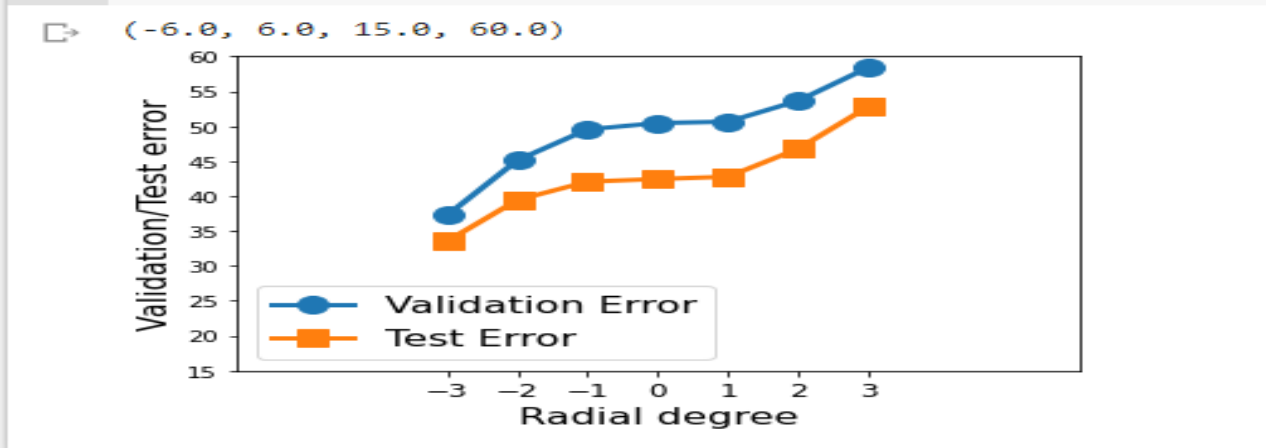


Part 2 C.

What are some ideal values of λ?

From the plot we could see that when radial degree i = - 3 or i = 3, in which λ = 0.001 or λ = 1000, the validation error and test error are minimized. λ = 0.001 might be closer to the ideal value of λ. In this case, we could say the differences between test and validation error would decrease while λ approaching to its smallest or biggest value.

Radial degree vs. Validation Plot



Part2 D

How does the linearity of the model change with λ?

From the plot, we could observe that when λ = 0.001, the function is more non-linear and closed to the true function, while when λ = 1000, the function is more linear and different than the true function.

Visualization of learned model