

3. Find polynomials that are upper and lower bounds on your curve from #2. From this specify a big-0, a big-Omega, and what big-theta is.

-> Answer

To find upper and lower bounds, we can fit polynomials to the data and use them to determine Big-0, Big-Omega, and Big-Theta.

```
# Fit polynomial curve
p = polyfit(n_values, times, 2);
fitted_curve = polyval(p, n_values);

# Plot the fitted curve
hold on;
plot(n_values, fitted_curve, 'r-', 'LineWidth', 2);
legend('Data', 'Fitted Curve');

# Display the polynomial coefficients
disp('Polynomial Coefficients:');
disp(p);
```

Now, to find the upper and lower bounds, we can use the coefficients of the fitted polynomial. Let's say the polynomial is of the form $ax^2 + bx + c$.

Upper Bound (Big-0): The highest degree term dominates the function. So, the upper bound is $O(n^2)$.

Lower Bound (Big-Omega): The lowest degree term dominates the function. So, the lower bound is $\Omega(n^2)$.

Big-Theta: Since upper and lower bounds are the same, Big-Theta is $\Theta(n^2)$.