The Report for Programming Assignments in Chapter Two

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1 How to Test

Enter the folder `Programming-Chapter2/src` with terminal, `make` here, you will see some executable files whose names are corresponding assignments. Run them directly and you will see the results.

2 Results

2.1 Assignment B

Here are the Newton's interpolation results.

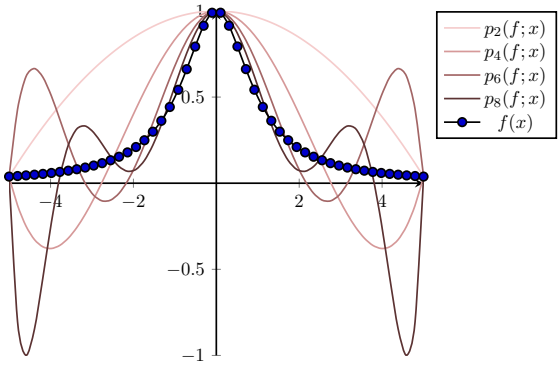
$$p_2(f;x) = 0.0384615 + 0.192308\pi_0(x) - 0.0384615\pi_1(x)$$

$$p_4(f;x) = 0.0384615 + 0.0397878\pi_0(x) + 0.061008\pi_1(x) - 0.0265252\pi_2(x) + 0.00530504\pi_3(x)$$

$$\begin{aligned} p_6(f;x) = {} & 0.0384615 + 0.0264644\pi_0(x) + 0.0248454\pi_1(x) + 0.0149446\pi_2(x) - 0.0131699\pi_3(x) \\ & + 0.00420316\pi_4(x) - 0.000840633\pi_5(x) \end{aligned}$$

$$\begin{aligned} p_8(f;x) = {} & 0.0384615 + 0.0223428\pi_0(x) + 0.013956\pi_1(x) + 0.0117043\pi_2(x) + 0.000674338\pi_3(x) \\ & - 0.00489646\pi_4(x) + 0.00243964\pi_5(x) - 0.000687223\pi_6(x) + 0.000137445\pi_7(x) \end{aligned}$$

The following figure shows the images of the interpolating polynomials and the original function.



This figure illustrates the Runge phenomenon significantly.