Specifications

Create R functions named `Neville` and `Lagrange` which takes a matrix of data points.

The functions should have the following parameters:

- `mat`, the matrix of data points (for `Neville` and `Lagrange`);
- `verbose`, a Boolean with a default of TRUE which prints the table of reliant values (for `Neville`);
- `x`, the x-coordinate sought for (for `Neville`);

The functions must return the following values:

- `f`, the interpolating polynomial being made as a function (for `Lagrange`);
- `fx`, the corresponding y-coordinate sought (for `Neville`).

Submission

The R file should be named as `<surname>_week7.r` (i.e. `encinas_week7.r`), and should be submitted at Google Classroom on the prescribed deadline. Demerits on late exercises will be enforced. Resubmissions are allowed, as long as the absolute deadline has not lapsed.

Word Problem

Using the code you have created, answer the following word problem below in a Google Document, or as attached otherwise.

1. Gather the Lagrangian and Neville's Interpolating Polynomial which explains the trend of the Philippine population from 1995 to 2015. Using the gathered polynomial, predict the population in 2004.
    a. For the computation in Lagrange's, place the final interpolating polynomial.
    b. For the computation in Neville's, include the table which was produced by the algorithm, as well as the final output, rounded into the nearest whole number.
2. Plot the Lagrangian Interpolating Polynomial in R from 1990 to 2020, as well as the coordinates of the said function in 2004.
    a. Provide appropriate titles for the graph, and let be the plot of the said coordinate be a solid filled circle of color red. Also, plot the points which make the interpolating polynomial as an x-mark of color blue.
    b. Attach the image that you have produced and interpret the results that you have gathered.

Year	Population Count
1995	68 349 452
2000	75 505 061
2005	82 079 348
2010	87 940 171
2015	93 440 274