Quiz No.1

True or false:

1- Using higher precision arithmetic will make an ill-conditioned problem well conditioned.

False

2- $\frac{e^x-1}{x}$ gives more accurate solution that $\frac{e^x-1}{Ln(x)}$ if x is small.

False

3- Let x_k be a monotonically decreasing, finite sequence of positive numbers.

To minimize rounding error, the sequence should be summed in decreasing order.

True

3- If a matrix is singular then it can not have an LU factorization.

False

If a linear system is well-conditioned then pivoting is unnecessary in Gaussian

Elimination.

False

Quiz No.2

1.

Consider the normalized floating point number system $\mathcal{F}$ defined by $(t, \beta, L, U) = (4, 8, -3, 3)$ containing numbers of the form $[\pm 0.d_1 d_2 d_3 d_4]_\beta \times \beta^p$, where $d_i \in \{0, 1, \ldots, 7\}$, $p \in \{-3, -2, -1, 0, 1, 2, 3\}$ and $d_1 \neq 0$ (except when all $d_i = 0$, representing a value of 0).
What is the smallest positive number in $\mathcal{F}$?

2.

True or false:

If two real numbers are exactly representable as floating-point numbers, then the result of a real arithmetic operation on them will also be representable as a floating-point number.

3.

In a floating-point system with precision $p = 6$ decimal digits, let $x = 1.23456$ and $y = 1.23579$. If the floating-point system is normalized, what is the minimum exponent range for which x, y, and $y - x$ are all exactly representable?

4.

Given the three data points $(-1, 1)$, $(0, 0)$, $(1, 1)$, determine the interpolating polynomial of degree two Using the Lagrange basis