

① What is Finite precision?

It is a decimal representation of a number which has been rounded or truncated.

② List the source of error.

In general error can be classified based on their source Numerical and non-Numerical error.

* non-Numerical error

- (a) modeling error:- generated by assumption and limitations.
- (b) blunder and mistake:- human error.
- (c) Uncertainty in information and data.

* Numerical source of error

- (a) round off error:- due to limited number of significant digits.
- (b) truncation error:- due to truncated terms.
Example infinite Taylor series.
- (c) propagation error:- due to the sequence of operations.
It can be reduced with good computational order.
- (d) Mathematical - approximation error
Example to use a linear model for representing a non-linear expression.

③ Define error measurement?

There are two types of measured error.

① Absolute error:- is the magnitude of the difference b/w the true value x and the approximate value x_a .

$$E_{abs} = \|x - x_a\|$$

while the actual error is $x - x_a$.

② Relative Error:- is defined as the ratio of the absolute error to the size of x . $E_{rel} = \frac{\|x - x_a\|}{\|x\|}$
w/c assume $x \neq 0$ other wise relative error is not defined.

④ Define mathematical modeling:

- A mathematical model is a description of a system using mathematical concepts and language
- The process of developing a model is termed mathematical modeling.

⑤ Define accuracy and precision.

Accuracy refers to how closely a value agrees with true value

Precision refers to how closely values agree with each other

⑥ Change 35.625 into binary system

Divisor	Quotient	Remainder
$35 \div 2$	17	1
$17 \div 2$	8	1
$8 \div 2$	4	0
$4 \div 2$	2	0
$2 \div 2$	1	0
$1 \div 2$	0	1

Process	Product	Decimal	Integer
0.625×2	1.25	0.25	1
0.25×2	0.5	0.5	0
0.5×2	1	0.0	1

$$[35.625]_{10} = \text{BKF}$$

$$[35.625]_{10} = [10011.101]_2$$