

Arithmetic Pipeline

Arithmetic pipelines are mostly used in high-speed computers. They are used to implement floating point operations, multiplication of fixed point numbers, and similar computations encountered in scientific problems.

The inputs to the floating-point address pipeline are two normalized floating point binary numbers defined as -

$$X = A * 2^a = 0.9504 * 10^3$$

$$Y = B * 2^b = 0.8200 * 10^2$$

Where A and B are two fractions that represent the mantissa and a and b are the exponents.

The combined operation of floating point addition and subtraction is divided into four segments. Each segment contains the corresponding suboperation to be performed in the given pipeline.

The suboperations that are shown in the four segments are →

- Compare the exponents by subtraction
- Align the mantissa
- Add or subtract the mantissas
- Normalize the result.

Pipeline organization for floating point addition and subtraction

