**NMATH**

**Build AST**

Interval Expression

We will use criteria to express the domain and range of a function. To do this job I break our criteria into 2 kinds. The first one is SimpleCriteria and another is CompositeCriteria.

Domain

For convenience, below rules shall be applied in processing interval domain.

* Variables are always stored in variable field of SimpleCriteria.

Interval 1

This is the most simple criteria

Type: **LT** | **LTE** | **GT** | **GTE**

Variable: <<**variable**>>

Value: <<**value**>>

Interval 2

The NMAST for above interval will look like:

Type: **GT\_LT | GTE\_LT | GT\_LTE | GTE\_LTE**

Variable: **x**

Type: **NUMBER | PI\_TYPE | E\_TYPE**

Value: left\_bound

Type: **NUMBER | PI\_TYPE | E\_TYPE**

Value: right\_bound

For example:

Interval 2

Type: **GT\_LT | GTE\_LT | GT\_LTE | GTE\_LTE**

Variable: **x**

Type: **NUMBER | PI\_TYPE | E\_TYPE**

Value: left\_bound

Type: **NUMBER | PI\_TYPE | E\_TYPE**

Value: right\_bound

**Get normal vector of a function f**

Base on derivative of the function f, we can calc normal vector of f at specified point M on f. First we determine the tangent of f at point M by:

API Specification

|  |  |  |
| --- | --- | --- |
| **Return type** | **Prototype** | **Description** |
| void | ***buildCompositeCriteria***(const NMAST \*ast, const char \*vars, int varCount, OutBuiltCriteria \*\*outCriteria) | Convert a NMAST tree into a criteria. |
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