XQuery Syntax in HXQ

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Symbols in **blue font** are lexical tokens (terminals), symbols in regular font are either meta-symbols or non-terminals. Here is the meaning of the meta-symbols (ϵ matches the empty input):

(a)	=	a	
a b	=	a then b	(concatenation)
a | b	=	either a or b	(alternation)
[a]	=	a | ϵ	(optionality)
{ a }	=	a | a a | a a a | ...	(repetition)
{ a ,}	=	a | a **,** a | a **,** a **,** a | ...	
{ a ;}	=	a | a **;** a | a **;** a **;** a | ...	
{, a }	=	ϵ | a | a **,** a | a **,** a **,** a | ...	

```
query       ::=  { declare variable var := e                      (a variable declaration)
                   | declare function qname ( { var [ as type ] ,} )
                        [ as type ] { e }                        (a function declaration)
                   | e ;}                                        (an XQuery)
qname       ::=  [ id : ] id                                     (a qualified name is namespace:localname)
var         ::=  $ id                                            (variables should begin with $)
string      ::=  “ { { { e ,} } | char } ”                       (you may embed XQuery values in a string)
type        ::=  qname [ () ] [ * | + ]                          (types are currently ignored)
e           ::=  ( for fbinds | let lbinds ) { for fbinds | let lbinds }
                        [ where e ] [ orderby ] return e         (FLOWR expression)
                 | some fbinds satisfies e                       (existential quantification)
                 | every fbinds satisfies e                      (universal quantification)
                 | if e then e else e
                 | insert e into e                               (insert the former inside the latter)
                 | delete from e                                 (remove from parent)
                 | replace e with e                              (replace the former with the latter)
                 | @ step predicates
                 | step predicates { path }                      (an XPath path)
                 | element                                       (element construction)
                 | e binop e                                     (binary operation)
                 | unop e                                        (unary operation)
                 | integer                                       (integer constant)
                 | double                                        (floating point)
                 | string
fbinds      ::=  { var [ at var ] in e ,}                        (for-bindings)
lbinds      ::=  { var := e ,}                                   (let-bindings)
orderby     ::=  order by { e [ ascending | descending ] ,}      (default is ascending)
binop       ::=  to | + | - | * | div | idiv | mod | = | != | < | <=
                 | > | >= | << | >> | is | eq | ne | lt | le | gt | ge
                 | and | or | not | union | intersect | except
unop        ::=  + | - | not
element     ::=  < qname { qname = string } > content </ qname >
                 | < qname { qname = string } />                 (empty element)
                 | element ( qname | { e } ) { { e ,} }
                 | attribute ( qname | { e } ) { { e ,} }
content     ::=  { { { e ,} } | string | text | element }
path        ::=  / step predicates                               (child-of)
                 | // step predicates                            (descendant-of)
                 | /@ step predicates                            (attribute-of)
                 | //@ step predicates                           (descendant-attribute-of)
                 | /.. predicates                                (parent-of)
predicates  ::=  { [ e ] }
step        ::=  var
                 | qname [ :: ( qname | * ) ]                    (an XPath step is axis::test)
                 | .                                             (current context)
                 | *                                             (any name)
                 | ( {, e } )                                    (sequence construction)
                 | qname ( {, e } )                              (function call)
```

Figure 1: XQuery BNF