X.2. SYNTAX OF THE XPLAIN DATA LANGUAGE

Help symbols are enclosed by < and >. The symbol **:** stands for 'can be' and the symbol | stands for 'or'. The symbol ε denotes the empty string. The symbol □ is used for marking the end of a number of alternatives. Standard keywords (as **base**, **type**, **init**, **get**, etc.) and special symbols (as **.**, **(**, **"**, **[**) are printed in bold typeface.

DATA DEFINITION

<definition list>:
    <definition command>
    |
    <definition list> <definition command>
    □

<definition command>:
    <definition> **.**
    |
    <deletion> **.**
    |
    <assignment> **.**
    |
    <comment>
    □

<definition>:
    <type definition>
    |
    <base definition>
    |
    <init definition>
    |
    <default definition>
    |
    <constant definition>
    □

<deletion>:
    <type deletion>
    |
    <general deletion>
    □

<assignment>:
    <constant> **=** **(** <expression> **)**
    □

<base definition>:
    base <base name> <domain>
    |
    base <base name> <domain> <domain constraint>
    □

<type definition>:
    type <type name> <domain> **=** <attribute list>
    □

<init definition>:
    init <initialisation>
    □

<default definition>:
    init default <initialisation>
    □

<constant definition>:
    constant <constant> <domain>
    □

<type deletion>:
    purge <type_or_constant>
    □

<general deletion>:
    purge <type name> **its** <attribute name>
    |
    purge init <type name> **its** <attribute name>
    □

<domain constraint>:
    = <enumeration>
    |
    <pattern>
    |
    <trajectory>
    □

<enumeration>:
<string enumeration>
|
<integer enumeration>
□

<string enumeration>:
<text>
|
<string enumeration> **,** <text>
□

<integer enumeration>:
<number>
|
<integer enumeration> **,** <number>
□

<trajectory>:
(border **..** border **)**
□

<border>:
***** | <number>
□

<pattern>:
<pattern character>
|
<pattern character> <pattern>
□

<pattern character>:
? | **x** | **9** | **-** | **.** | **,** | **** | **/** | **:** | **;** | <space>
□

<subject>:
<type name>
□

<plus_or_minus>:
+ | **−**
□

<mult_or_div>:
***** | **/** | **%**
□

<logical expression>:
<logical expression> **or** <logical term>
|
<logical term>
□

<logical term>:
<logical term> **and** <logical factor>
|
<logical factor>
□

<logical factor>:
<logical expression>
|
not <logical expression>
|
<property expression> <relation> <property expression>
|
not <property expression> <relation> <property expression>
|
(<logical expression> **)**
|
not (<logical expression> **)**
|
<logical value>
|
not <logical value>
□

<relation>:
< | <= | <> | > | >= | =
□

<logical value>:
true | **false**
□

<system variable>:
systemdate | **loginname**
□

<property expression>:
<property expression> <plus_or_minus> <property term>
|
<property term>
□

<property term>:
<property term> <mult_or_div> <property factor>
|
<property factor>
□

<property factor>:
<property name>
|
− <property name>
|
<system variable>
|
combine (<property expression> **,** <property expression> **)**
|
head (<property expression> **)**
|
tail (<property expression> **)**
|
integer (<property expression> **)**
|
real (<property expression> **)**
|
string (<property expression> **)**
|
datef (<property expression> **)**
|
newdate (<property expression> **,** <property expression> **)**
|
timedif (<property expression> **,** <property expression> **)**
|
isdate (<property expression> **)**
|
yearf (<property expression> **)**
|
monthf (<property expression> **)**
|
dayf (<property expression> **)**
|

wdayf (<property expression> **)**
|
(<property expression> **)**
|
− (<property expression> **)**
|
<text>
|
<numeric>
□

<numeric>:
<number>
|
<real>
□

<property name>:
<attribute name>
|
<attribute name> **its** <property name>
□

<attribute name>:
<prefix> <name>
□

<constant_or_property>:
<attribute name>
|
<constant>
|
<attribute name> **its** <constant_or_property>
□

<initialisation>:
<type name> **its** <attribute name> **=** <init specification>
□

<init specification>:
<property expression>
|
if <condition> **then** <init specification> **else** <init specification>
|

case <selector> **of** <case list>
□

<condition>:
<property expression>
□

<selector>:
<property expression>
□

<case list>:
<element list> <default element>
□

<element list>:
<element> **;**
|
<element list> <element> **;**
□

<element>:
<label list> **:** <init specification>
□

<default element>:
default : <init specification>
□

domain:
(A number **)**
|
(B)
|
(I number **)**
|
(R number **,** number **)**
|
(D)
□

<type name>:
<name>
□

<base name>:
<name>
□

<constant>:
<name>
□

<type_or_constant>:
<name>
□

<prefix>:
ε
|
<name>_
□

<attribute list>:
<definition attribute>
|
<attribute list> , <definition attribute>
□

<definition attribute>:
[<attribute>]
|
<attribute>
□

<attribute>:
<type name>
|
<prefix> <type name>
□

<name>:
<letter followed by at most 19 letters and/or digits>
□

<text>:
" <collection of printable characters> "
□

<number>:
<numeric value possibly preceded by a sign>
□

<date>:
<valid calendar date: 8 digits without sign according interpretation jjjjmmdd>

<real>:
<real numeric possibly preceded by a sign>
□

<comment>:
comment text <sign for newline>
□

<comment text>:
<collection of printable characters>
□

<string function>:
combine | **head** | **tail**
□

<conversion function>:
integer | **real** | **string** | **datef**
□

<date function>:
newdate | **timedif** | **isdate** | **yearf** | **monthf** | **dayf** | **wdayf**
□

DATA MANIPULATION

<manipulation list>:
    <command> **.**
    |
    <query> <command> **.**
    |
    <comment>
    □

<command>:
    <retrieval>
    |
    <modification>
    |
    newline
    □

<modification>:
    <update>
    |
    <delete>
    |
    <insert>
    |
    <cascade>
    □

<insert>:
    insert <subject> **its** <assignment list>
    |
    insert <name> *** its** <assignment list>
    □

<assignment list>:
    <assignment> **,** <assignment list>
    |
    <assignment>
    □

<assignment>:
<attribute name> **=** <assigned value>
□

<assigned value>:
<property expression>
|
(<logical expression> **)**
□

<cascade>:
<name> **its** <attribute name> **=** <cascade specification>
□

<cascade specification>:
<expression> <predicate>
|
(<logical expression> **)** <predicate>
|
<selection expression> **per** <property name>
|
<selection expression> **per** <property name> **,** <property name>
□

<deletion>:
delete <subject> <predicate>
□

<subject>:
<name> <idstring>
□

<idstring>:
ε
|
<text>
|
<name>
□

<update>:
update <subject> **its** <assignment list> <predicate>
□

<attribute name>:
<prefix> <name>
□

<retrieval>:
<selection>
|
<extension>
|
<value>
|
echo <text>
□

<value>:
value <name> = <value definition>
□

<value definition>:
<property expression>
|
<value_selection expression>
|
<input>
□

<input>:
input <domain>
|
input <domain> <text>
□

<domain>:
(A <numeric> **)**
|
(B)
|
(I <numeric> **)**
|
(R <numeric>, <numeric> **)**
|
(D)
□

<value_selection expression>:
<set function> <subject> <property> <predicate>
□

<selection>:
get <selection expression>
|
get <text> <selection expression>
□

<extension>:
extend <extension expression>
□

<extension expression>:
<name> **with** <extend attribute> = <extension definition>
□

<extend attribute>:
<name>
|
<name> <domain>
□

<extension definition>:
<property expression>
|
(<logical expression> **)**
|
<selection expression> **per** <property name>
□

<selection expression>:
<set function> <subject> <property> <predicate>
|
<subject> <property> <predicate>
□

<set function>:
max | **min** | **total** | **count** | **some** | **nil** | **any**
□

<string function>:
combine | **head** | **tail**
□

<conversion function>:
integer | **real** | **string** | **datef**
□

<date function>:
newdate | **timedif** | **isdate** | **yearf** | **monthf** | **dayf** | **wdayf**
□

<mathematical function>:
pow | **abs** | **sqrt** | **max** | **min** | **exp** | **ln** | **log10** | **sin** | **cos** | **tan** | **asin** | **acos** | **atan** | **sinh** | **cosh** | **tanh** | **asinh** | **acosh** | **atanh**

<property>:
ε
|
its <property list>
□

<property list>:
<property expression>
|
<property expression> **,** <property list>
□

<predicate>:
ε
|
where <logical expression>
□

<logical expression>:
<logical expression> **or** <logical term>
|
<logical term>
□

<logical term>:
<logical term> **and** <logical factor>
|
<logical factor>
□

<logical factor>:
<logical expression>
|

not <logical expression>
|
<property expression> <relation> <property expression>
|
not <property expression> <relation> <property expression>
|
(logicalexpression **)**
|
not (logicalexpression **)**
|
<logical value>
|
not <logical value>
□

<relation>:
< | <= | <> | > | >= | =
□

<logical value>:
true | **false**
□

<property expression>:
<property expression> <plus_or_minus> <property term>
|
<property term>
□

<plus_or_minus>:
+ | −
□

<property term>:
<property term> <mult_or_div> <property factor>
|
<property factor>
□

<mult_or_div>:
***** | / | **%**
□

<property factor:
<property name>

|
− <property name>
|
pow (<property expression> **,** <property expression> **)**
|
log (<property expression> **)**
|
sqrt (<property expression> **)**
|
max (<property expression>, <property expression>)
|
min (<property expression>, <property expression>)
|
ln (<property expression> **)**
|
exp (<property expression> **)**
|
sin (<property expression> **)**
|
cos (<property expression> **)**
|
tan (<property expression> **)**
|
abs (<property expression> **)**
|
asin (<property expression> **)**
|
acos (<property expression> **)**
|
atan (<property expression> **)**
|
asinh (<property expression> **)**
|
acosh (<property expression> **)**
|
atanh (<property expression> **)**
|
sinh (<property expression> **)**
|
cosh (<property expression> **)**
|
tanh (<property expression> **)**
|
combine (<property expression> **,** <property expression> **)**
|

head (<property expression> **)**
|
tail (<property expression> **)**
|
integer (<property expression> **)**
|
real (<property expression> **)**
|
string (<property expression> **)**
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datef (<property expression> **)**
|
newdate (<property expression> **,** <property expression> **)**
|
timedif (<property expression> **,** <property expression> **)**
|
isdate (<property expression> **)**
|
yearf (<property expression> **)**
|
monthf (<property expression> **)**
|
dayf (<property expression> **)**
|
wdayf (<property expression> **)**
|
(<property expression> **)**
|
− **(** <property expression> **)**
|
<text>
|
loginname
|
<numeric>
□

<numeric>:
<number>
|
<real>
|
systemdate
□

<property name>:
<attribute name>
|
<attribute name> **its** <property name>
□

<prefix>:
ε
|
<name>_
□

<name>:
<letter followed by at most 19 letters and/or digits>
□

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□

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