Using simple I/O and Math in a Cylinder Specification

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1 The Cylinder Module

module $CYLINDER$

imports

1.0 from $CYLIO$

2.0 functions $ExtGetCylinder : () \to CircCyl$

3.0 operations $ExtShowCircCylVol : CircCyl \times \mathbb{R} \xrightarrow{o} ()$,

4.0 from $MATH$

5.0 values $ExtPI : \mathbb{R}$

6.0 functions $ExtSin : \mathbb{R} \to \mathbb{R}$

exports

7.0 types struct $CircCyl$

definitions
types

8.0 $CircCyl :: rad : \mathbb{R}$
.1 $height : \mathbb{R}$
.2 $slope : \mathbb{R}$

functions

9.0 $CircCylVol : CircCyl \to \mathbb{R}$
.1 $CircCylVol(cyl) \triangleq$
.2 $MATH`ExtPI \times cyl.rad \times cyl.rad \times cyl.height \times MATH`ExtSin(cyl.slope)$

operations

10.0 $CircCylOp : () \xrightarrow{o} ()$
.1 $CircCylOp() \triangleq$
.2 (let $cyl = CYLIO`ExtGetCylinder()$ in
.3 let $vol = CircCylVol(cyl)$ in
.4 $CYLIO`ExtShowCircCylVol(cyl, vol)$)

end $CYLINDER$

2 The Cylio DL Module

dlmodule $CYLIO$

imports

11.0 from $CYLINDER$

12.0 types $CircCyl$

exports

13.0 functions $ExtGetCylinder : () \rightarrow CYLINDER`CircCyl$

14.0 operations $ExtShowCircCylVol : CYLINDER`CircCyl \times \mathbb{R} \xrightarrow{o} ()$

15.0 uselib "$libcylio.so$"

end $CYLIO$

3 The Math DL Module

dlmodule $MATH$

exports

16.0 values $ExtPI : \mathbb{R}$

17.0 functions $ExtCos : \mathbb{R} \rightarrow \mathbb{R}$;

.1 $ExtSin : \mathbb{R} \rightarrow \mathbb{R}$

18.0 uselib "$libmath.so$"

end $MATH$