```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\WKO4"];
<< AwCalculus.m;
$SeriesShowDegree = 4;
```

FreeLie` implements / extends

  {*, +, **, $SeriesShowDegree, ⟨⟩, ∫, ≡, ad, Ad, adSeries, AllCyclicWords,
   AllLyndonWords, AllWords, ASeries, AW, b, BCH, BooleanSequence, BracketForm, BS,
   CC, Crop, CW, CWS, CWSeries, D, Deg, DegreeScale, DerivationSeries, div, EulerE,
   Exp, InvertLieMorphism, j, J, JA, LieDerivation, LieMorphism, LieSeries, LS, LW,
   LyndonFactorization, New, RandomCWSeries, Randomizer, RandomLieSeries, RC, SeriesSolve,
   Support, tb, TopBracketForm, tr, UndeterminedCoefficients, Γ, ι, Λ, ℏ, ⌐, ⌐}.

AwCalculus` implements / extends {*, **, E, ≡, dA, dc, deg, dm,
   dS, dΔ, dη, dσ, hA, hm, hS, hη, hσ, l, s, tA, tha, tm, tS, tσ, Γ, Λ, E₁, Eₛ}.

```
R⁺ₜ:(1|s)[a_, b_] := Eₜ[⟨a → LS[0], b → LS[LW@a]⟩, CWS[0]];
R⁻ₜ:(1|s)[a_, b_] := Eₜ[⟨a → LS[0], b → -LS[LW@a]⟩, CWS[0]];
```

```
{λ, ω} = List @@ R⁺ₛ[x, z]
```

{⟨x → LS[0, 0, 0, 0, ...], z → LS[x̄, 0, 0, 0, ...]⟩, CWS[0, 0, 0, 0, ...]}

```
λ // FullForm
```

AngleBracket[Rule[x, LieSeries[LieSeries$5]], Rule[z, LieSeries[LieSeries$6]]]

```
λ // hσ[{x, y, z} → {"1", "2", "3"}]
```

⟨1 → LS[0, 0, 0, 0, ...], 2 → y, 3 → LS[x̄, 0, 0, 0, ...]⟩

```
λ // hσ[z, 3] // FullForm
```

AngleBracket[Rule[3, LieSeries[LieSeries$6]], Rule[x, LieSeries[LieSeries$5]]]

```
λz
```

LS[x̄, 0, 0, 0, ...]

```
{λ1, ω1} = List @@ R⁺ₛ[y, z]
```

{⟨y → LS[0, 0, 0, 0, ...], z → LS[ȳ, 0, 0, 0, ...]⟩, CWS[0, 0, 0, 0, ...]}

```
λ1 // hσ[{x, y, z} → {"1", "2", "3"}]
```

⟨1 → x, 2 → LS[0, 0, 0, 0, ...], 3 → LS[ȳ, 0, 0, 0, ...]⟩

```
a = 5;
Table[a, {a, 4}]
```

{1, 2, 3, 4}

```
b = 5;
c := Table[b, {b, {1, 2, b}}];
c
```

{1, 2, 5}

```
Es[3, 4]
```

Es[3, 4]

```
Es[5, 6] // FullForm
```

AwCalculus`Private`Es[5, 6]