

Soar Language Server

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Soar Language Server

Existing SoarIDE is an Eclipse plugin.

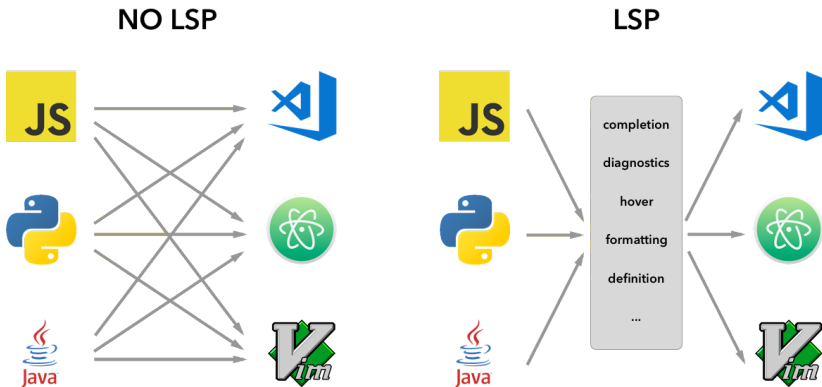
- ▶ Hasn't been maintained
- ▶ Only supports Eclipse

<https://github.com/soartech/soaride>

Microsoft's Language Server Protocol (LSP) is an increasingly popular way to bring IDE features to multiple editors.

Language Server Protocol

Defines a common interface for editors to talk to programs that provide IDE features.



<https://microsoft.github.io/language-server-protocol/>

Features

- ▶ Works in many IDEs and editors
- ▶ **Error reporting** backed by JSoar
- ▶ **Tcl expansion** for inline code
- ▶ **Go to definition** for Tcl variables and procs
- ▶ **Find references** for Tcl variables and procs
- ▶ **Autocomplete** - for Tcl variables and procs
- ▶ **Hover tooltips** for variable values and procedure docs
- ▶ **Rename** for Tcl variables
- ▶ **Code folding**

Setup

Create a `soarAgents.json` file to tell the server where the entry point is.

```
{ } soarAgents.json
```

```
{
  "entryPoints": [
    {
      "name": "goal-based",
      "path": "GoalBased/load.soar"
    },
    {
      "name": "wander",
      "path": "Wander/load.soar"
    }
  ],
  "active": "goal-based"
}
```

Error reporting

```
File Edit Selection Find View Goto Tools Project Preferences Help

FOLDERS
  ngs4-tanksoar
    GoalBased
    new-goal-system-4
    Wander
  .project
  anthony@axiom.
  goalbased.soaragen
  License.txt
  README.md

main-agent.soar
6 #####
7 # Main data structure
8 #####
9
10 sp "tank-soar*create
11 [ngs-match-top-state <s>]
12 [ngs-create-attribute <s> tank-soar <t
13
14 #####
15 # For now we have one goal heirarc
16 #####
17
```

```
ion error In production 'tank-soar*create', expected --> in production
(Ignoring production tank-soar*create)
```

Autocomplete

```
sp "tank-soar*create
[ngs-match-top-state <s>]
-->
[ngs-cre
ngs-create-atomic-operator (Function)
#### ngs-create-attribute (Function) #####
# ngs-create-attribute-by-operator (Function)
# ngs-create-computed-val (Function) the game!)
#### ngs-create-debug-trace-item (Function) #####
# ngs-create-debug-trace-pool (Function)
ngs-create-dyn-bin-value (Function)
sp "ngs-create-function-operator (Function)
ngs-create-goal-as-return-value (Function) soar]
--> ngs-create-goal-by-operator (Function)
[ngs-create-goal-in-place <pool> AchieveWinTankSoar $NGS_GB_ACHIEVE <g>]"

#####\
#
# The top level decision is what maneuver to do
#####\
#

-UU-:***--F1 main-agent,soar 7% L13 Git-master (Soar company-capf LSP[soar
```

Hover docs

```
sp "tank-soar*create
  [ngs-match-top-state <s>]
-->
  [ngs-create-attribute <s> tank-soar <tank-soar>]"
```

Create working memory element, i.e. an object "attribute"

This will create the code to generate a simple soar WME preference(s) (default +, but other's are allowed). Normally you don't need to use this method, but this method is used throughout the NGS to construct goals, operators, and typed objects.

You can simply create object substructure using standard Soar syntax (which is a bit more compact), but in the future, this type of method might be used to do type checking or other processing, so it's advisable to use it if the standard creation processes won't work for you.

```
[ngs-create-attribute parent_obj_id attribute value (prefs)]
```

```
parent_obj_id - A variable bound to the parent object of the WME (left hand si
-UU-:----F1 main-agent,soar 7% L13 Git-master (Soar company LSP[soar-ls:2
ngs-create-attribute parent_obj_id attribute value
```


Definitions

```
main-agent.soar GoalBased
#           The top level decision is what maneuver to do
#####

sp "maneuver-decision
  [ngs-match-goal <s> AchieveWinTankSoar <g>]

lhs-fragments.tcl ~/git/ngs4-tanksoar/new-goal-system-4/ngs-4_0_0/macros
# goal_pool_id - (Optional) If provided, this is a
#           goal pool for goals of the given goal_type
#?
proc ngs-match-goal { state_id
                    goal_type
                    goal_id
                    {basetype ""}
                    {goal_pool_id ""}} {

# Default value initialization
CORE_GenVarIfEmpty goal_pool_id "goal-pool"

-->
[ngs-irequest-decision <g> $TS_DECISION_MANEUVER <g> maneuver

#####
#           Select the best ranked choice if more than one exists
```

Tcl expansion

```
main-agent.soar GoalBased
sp "tank-soar*create
  [ngs-match-top-state <s>]
-->
  [ngs-create-attribute <s> tank-soar]
#####
#           For now we have one goal here
#####
sp "win-game*top-level-goal
  [ngs-match-goalpool <s> <pool> <Ac
-->
  [ngs-create-goal-in-place <pool> ]
#####
#           The top level decision is w

~tcl-expansion.soar
sp {tank-soar*create
  (state <s> ^superstate nil)
-->
  (<s> ^tank-soar <tank-soar> +)}

sp {win-game*top-level-goal
  (state <s> ^superstate nil
    ^goals.A
-->
  (<pool> ^goal <g> +)
    (<g> ^type achievement
    (<g> ^__tagged*ngs*cons
    (<g> ^__tagged*ngs*i-s
  )}
```

Try it

- ▶ <https://github.com/soartech/soar-language-server/releases>
- ▶ Soar Language Support in the VSCode Marketplace
- ▶ Tested in Emacs, Sublime; lightly tested in IntelliJ, Eclipse
- ▶ Expected to work in other editors

Please send feedback via GitHub issues or to anthony.j.deschamps@gmail.com

Thank you

- ▶ Bob Marinier
- ▶ Robert Picking
- ▶ Dana Foley
- ▶ Previous SoarIDE developers (Dave Ray, Kyle Aron, and others)
- ▶ Bryan DeGrendel and Nathan Glenn for syntax highlighters

<https://github.com/soartech/soar-language-server>