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Leveraging Posit for AI-Driven Code Generation and Intuitive R Shiny Tool Building

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Agenda

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- **Posit in Pharma**
- **Positron**
- **Posit Assistant**
- **MCP Server**
- **Data Security in AI**

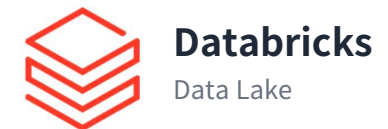


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Posit in Pharma



Integrate R & Python programming
language and AI cloud platform



Posit Workbench

A secure and regulated development platform
integrated with R & Python

Posit Connect

A content publishing, scheduling and collaboration
platform

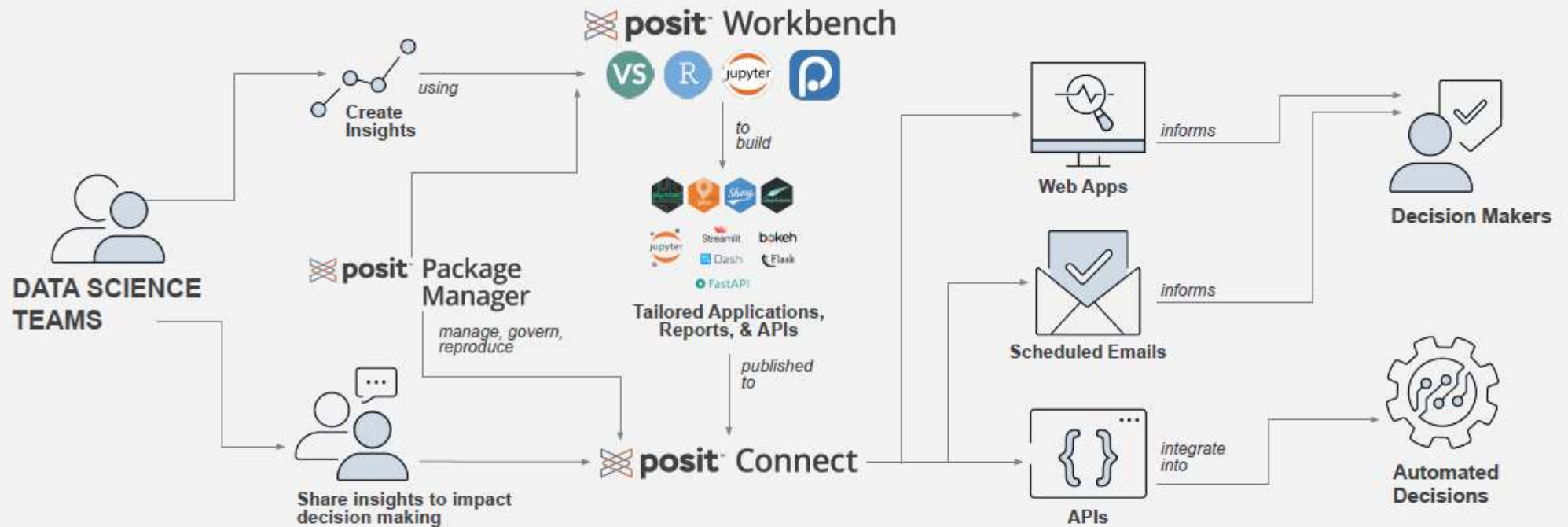
Posit Package Manager

A centralized repository and lifecycle management
tool for R & Python packages



Posit Workflow

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Posit in Pharma

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Roche migrated 90% of teams to open-source platforms within 12 months.



GSK committed to producing 50% of clinical code in R by 2025 and has met this target for new studies.



Johnson & Johnson completed four successful R-based submissions while maintaining traditional backup systems.



Novo Nordisk established the regulatory precedent with their complete R submission accepted by multiple agencies.





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Positron

Next Gen Data Science IDE

- Real-time Context Awareness
- Optimized for data science
- Customizable
- AI equipped



New Notebook



New File



Positron Overview

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Activity Bar:

- Access the Explorer
- Search
- Source Control
- Extensions
- Other views

Primary Side Bar:

- Shows different views depending on what you have chosen in the Activity Bar
- When the Explorer is chosen, the Primary Side Bar provides a file explorer

Editor:

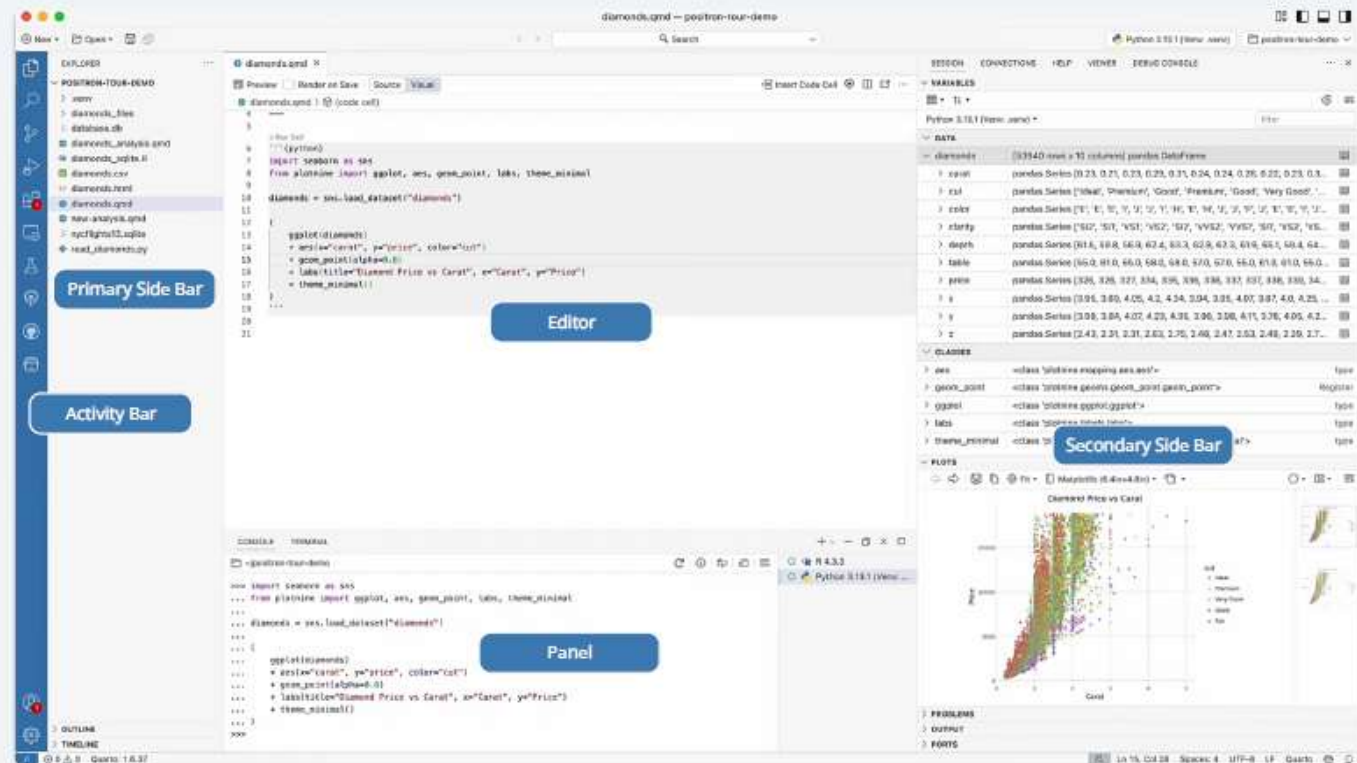
- Where you write your code

Panel:

- Contains the Console and Terminal

Secondary Side Bar:

- Explore variables, view plots, access documentation, and more





Positron Assistant

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**Positron
Assistant**
Preview

An
AI client
within Positron.

> Chat and inline edits.
Code completion available with github Copilot.

> Model agnostic. Follows Posit's Bring-your-own-LLM philosophy.

> For data science, designed to have the context data science tasks require.



Positron Assistant Provider

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Configure Language Model Providers

Provider



Posit AI



Amazon
Bedrock



Anthropic

Custom
Provider



GitHub
Copilot



OpenAI



Snowflake
Cortex

Authentication



OAuth



API Key

Sign out

Base URL: <https://dashscope.aliyuncs.com/compatible-mode/v1>

A custom provider is considered "Third Party Materials" as defined in the [Posit EULA](#) and subject to the its Terms of Service and Privacy Policy.

Your use of the custom provider is optional and at your sole risk.



Positron Assistant

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Positron Assistant
uses your environment
as context, including
your data, plots, tables
and code

The screenshot displays the Positron Assistant interface within the Positron IDE. The main editor shows an R script for clinical data analysis. A sidebar on the left contains a 'CHAT' panel with a 'Set Up Positron Assistant' button. A 'CONSOLE' panel at the bottom shows the execution of R code. On the right, a 'VARIABLES' panel lists data objects, and a 'PLOTS' panel displays a bar chart titled 'Adverse Event Severity by Treatment Group'.

Code Snippet:

```
1 ---  
2 title: "Untitled"  
3 format: html  
4 ---  
5  
6 # Data  
7 #> Read from Next Cell  
8 {r}  
9 library(pharmaverseadam)  
10 library(tern)  
11 library(dplyr)  
12  
13 adsl <- adsl %>%  
14   df_explicit_na()  
15  
16 adae <- adae %>%  
17   df_explicit_na()  
18  
19 # Visualization  
20 #> Run Cell | Run Next Cell | Run Above  
21 {r}  
22 library(ggplot2)  
23  
24 digits = list(all_categorical()~c(0,1))  
25 ) |>  
26 add_overall(col_label = "**Overall**<br>N={N}") |>  
27 add_n() |>  
28 modify_header(  
29   label = "**System Organ Class / Preferred Term**",  
30   all_stat_cols() ~ "**{level}**<br>N = {n}"  
31 ) |>  
32 modify_caption("**Table1. Patients with Adverse Events**") |>  
33 modify_footnote(  
34   all_stat_cols() ~ "n (%); Percentages calculated within treatment group" ) |>  
35 bold_labels() |>  
36 italicize_levels()
```

Data Variables:

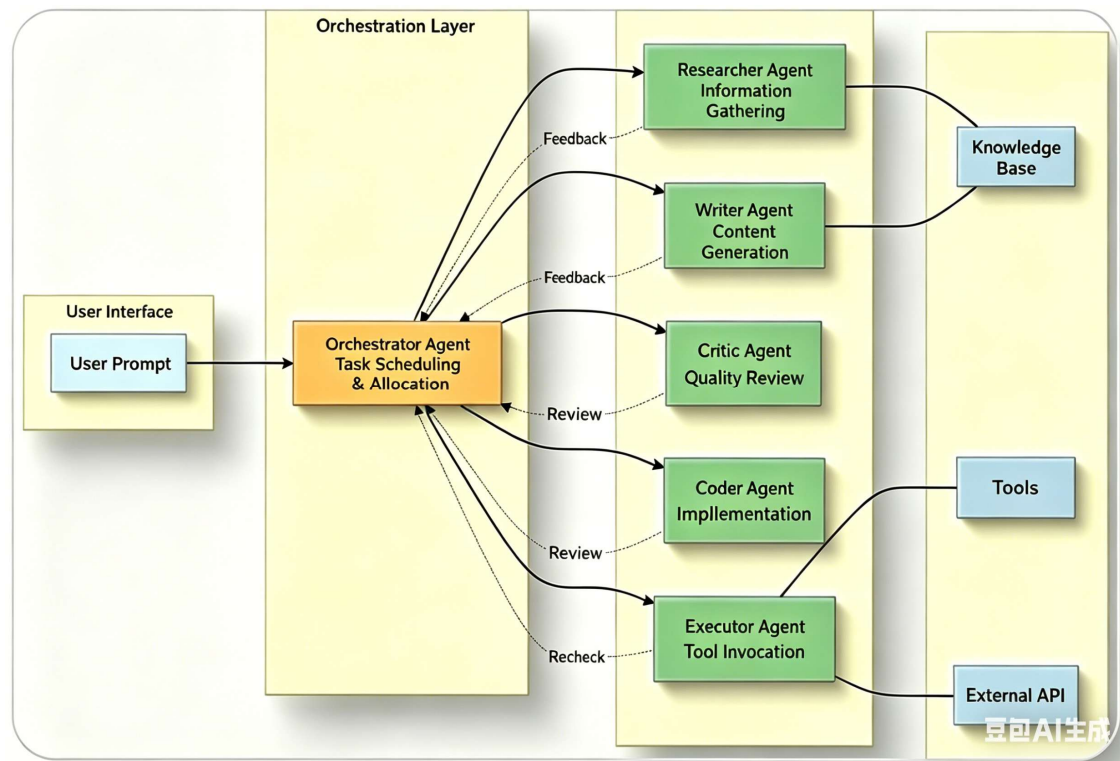
Variable	Dimensions	Format
adae	[1191 rows x 107 columns]	<tbl_df>
adsl	[306 rows x 55 columns]	<tbl_df>
ae_summary	[3 rows x 5 columns]	<tbl_df>

Plot: A stacked bar chart titled 'Adverse Event Severity by Treatment Group'. The x-axis shows three treatment groups: Placebo, Xanomeline High Dose, and Xanomeline Low Dose. The y-axis represents the 'Number of Adverse Events' from 0 to 400. The legend indicates three severity levels: MILD (blue), MODERATE (orange), and SEVERE (red).



Multi-Agent

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Planning Module

Function: Decompose complex goals into executable plans.

Action Module

Function: Call external tools, APIs to execute tasks.

Reflection Module

Function: Review errors, analyze causes & correct strategies



Custom Agent for Pharmaverse

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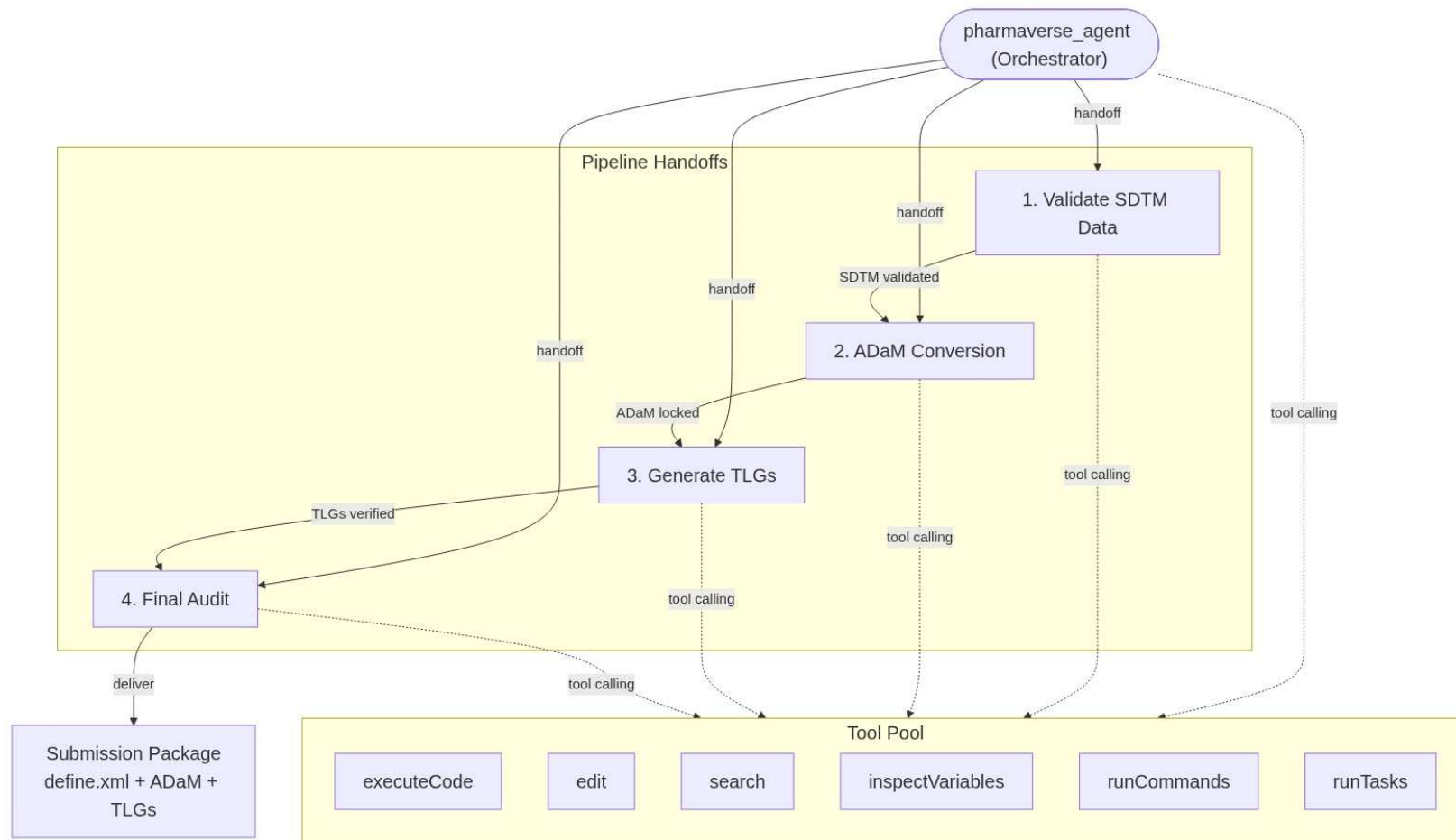
```
pharmaverse.agent.md X

.github > agents > pharmaverse.agent.md
1 ---
2 description: 'End-to-end Pharmaverse pipeline automation for clinical trial data processing, covering SDTM ingestion & validation, CDISC-compliant ADaM dataset
3 name: 'pharmaverse_agent'
4 tools: ['executeCode', 'edit', 'search', 'inspectVariables', 'runCommands', 'runTasks']
5 handoffs:
6   - label: Validate SDTM Data
7     agent: agent
8     prompt: Perform comprehensive CDISC SDTM validation on all input SDTM domains (DM, AE, CM, EX, LB, VS, MH, EG, DS, PE etc.) including variable existence
9     send: true
10  - label: Test ADaM Conversion
11    agent: agent
12    prompt: Execute full admiral-based ADaM derivation code for all required analysis datasets (ADSL, ADAE, ADCM, ADEX, ADLB, ADVS, ADTTE, ADPP, ADMH etc.),
13    send: true
14  - label: Generate TLGs
15    agent: agent
16    prompt: Run production-grade, reproducible TLGs generation code using finalized & QC-passed ADaM datasets; create standard clinical tables (demographics,
17    send: true
18  - label: Final Pipeline Audit
19    agent: agent
20    prompt: Conduct end-to-end full pipeline audit including complete data lineage verification (SDTM → ADaM → TLGs), code reproducibility validation, CDISC &
21    send: true
22
```



Custom Agent for Pharmaverse

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Posit Assistant (2026.04)



Posit Assistant (2026.04)

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Welcome to Positron Assistant

Preview

Agent Mode

Positron Assistant is an AI coding companion designed to accelerate and enhance your data science projects.



Hi! I'm Databot, ready to help you analyze and visualize your data.

I'll suggest some questions below. Feel free to ask me anything else too - I'm here to help!

- ✦ [Check what data is currently loaded and show me a summary](#)
- ✦ [Load a new dataset from a file](#)
- ✦ [Create some basic visualizations of my data](#)
- ✦ [Help me clean and preprocess my data](#)
- ✦ [Perform statistical analysis on my variables](#)

What would you like to explore today?



Posit Assistant

Start a conversation with Posit Assistant to analyze data, create visualizations, write code, and more.

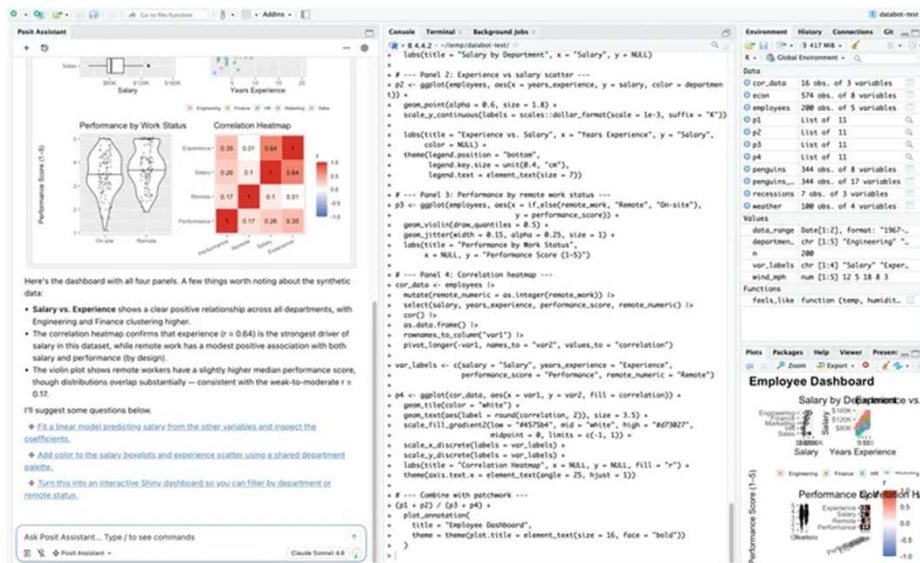
Posit Assistant is an experimental AI tool. By participating in Early Access, you acknowledge that it has the capability to read, analyze, and modify your data, as well as execute arbitrary R code on your behalf. Please exercise caution, especially if working with sensitive data.

Released in August, 2025 for exploratory data analysis and trial use



Posit Assistant (2026.04)

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Posit Assistant is Posit's next-generation AI-native assistant, launched in April 2026. It is deeply integrated into Posit's leading R and Python data science platforms. Its goal is to liberate analysts from tedious coding through seamless AI capabilities, accelerating insight.



Native Extensible Skills Framework

Empower end-to-end data science workflows with built-in and custom skills.



MCP Servers – Extend Posit Assistant Capabilities

Leverage the Model Context Protocol (MCP) to connect external tool servers and integrate custom tools including databases, APIs, and internal services.

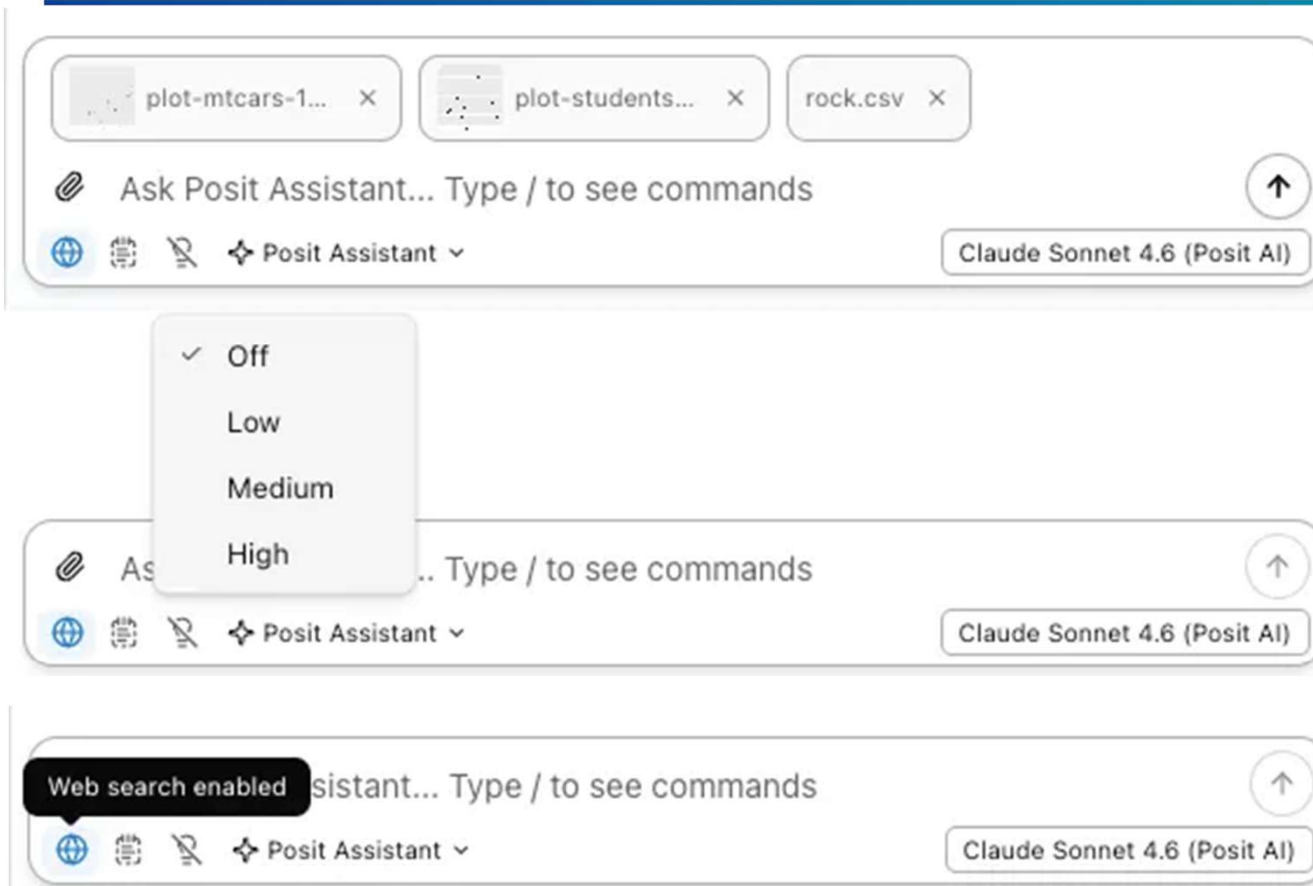


Context Management

Persist session awareness and optimize context for accurate AI assistance.

phuse Chat Features

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Uploading Files

Drag and drop — Drag files directly into the chat input area.

Paste images — Paste images from your clipboard (Cmd+V / Ctrl+V).

Paperclip button — Click the paperclip icon in the chat input to open a file picker.

Thinking Effort

Models that support extended thinking let you control how much reasoning happens before a response.

Web Search

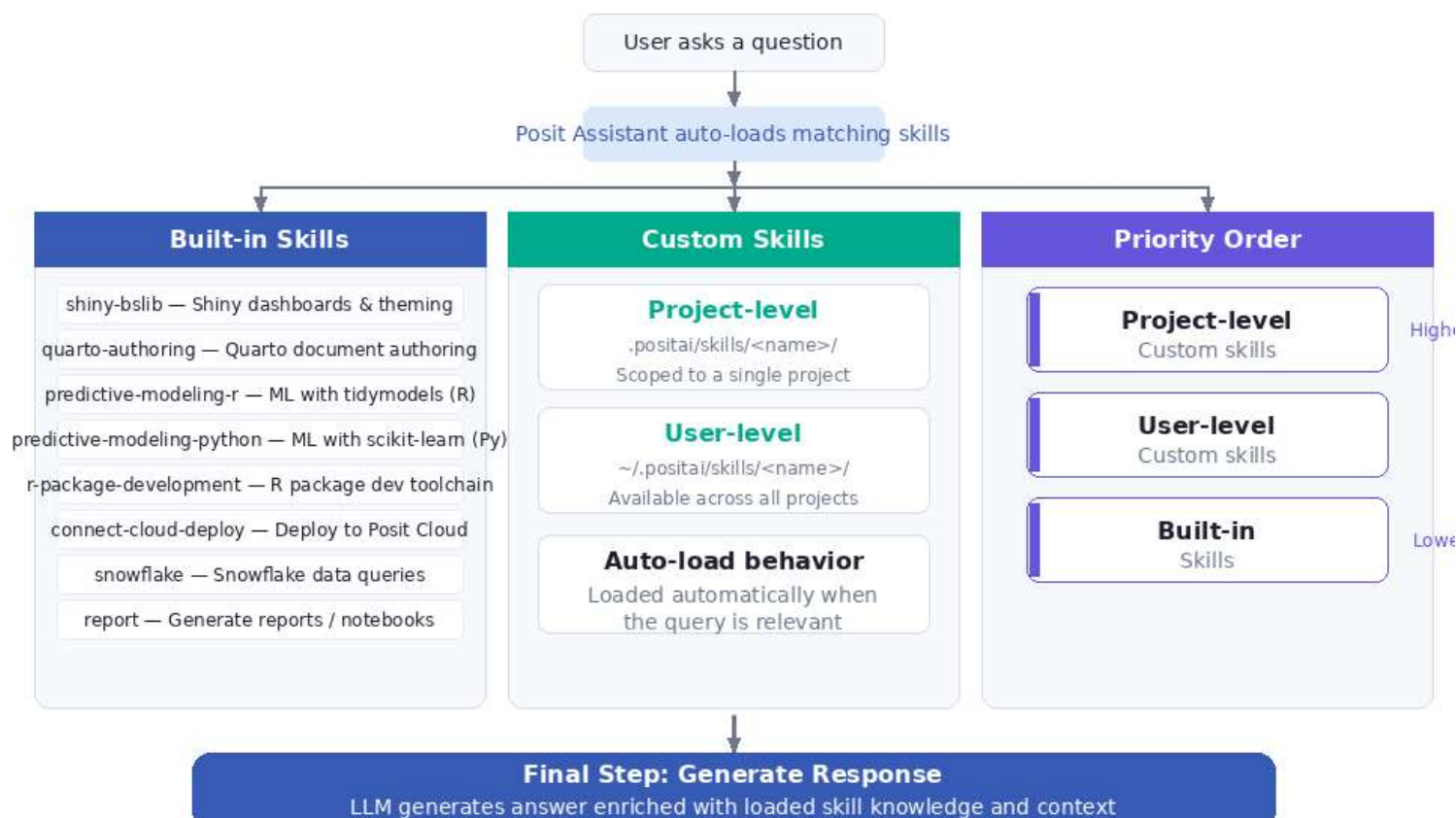
When enabled, the assistant can search the web to find current information, documentation, or answers to questions outside its training data.



Posit Assistant Skills

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Posit Assistant — Skills Feature Overview





Commands & Skills

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Commands

<code>/report</code>	Create a report as a Quarto document
<code>/savememory</code>	Create or update memory file
<code>/compact</code>	Compact conversation to reduce token usage
<code>/about</code>	Show version and build information
<code>/context</code>	Show session context and token usage
<code>/yolo</code>	Toggle YOLO mode (skip tool confirmations)
<code>/new</code>	Start a new conversation
<code>/restricted</code>	Toggle restricted mode
<code>/sandbox</code>	Toggle sandbox mode for bash commands
<code>/plan</code>	Enter Plan mode



Claude Sonnet 4.6

Built-in Skills

SKILL	DESCRIPTION
<code>connect-cloud-deploy</code>	Deploy apps and documents to Posit Connect Cloud
<code>create-skill</code>	Create new Agent Skills following the specification
<code>predictive-modeling-python</code>	Modeling and machine learning with scikit-learn in Python
<code>predictive-modeling-r</code>	Modeling and machine learning with tidymodels in R
<code>quarto-authoring</code>	Write and author Quarto documents (.qmd)
<code>report</code>	Create Quarto documents or notebooks from conversations
<code>r-package-development</code>	R package development with devtools, testthat, and roxygen2
<code>shiny-bslib</code>	Build modern Shiny dashboards and apps with bslib
<code>shiny-bslib-theming</code>	Advanced theming for Shiny apps using bslib and Bootstrap 5
<code>snowflake</code>	Connect to Snowflake and query data via semantic views



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MCP Server



MCP Server for Package Manager

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New MCP Feature	Enabled Research/Data Science Capability	Value for Data Scientists
Intelligent Package Discovery	LLMs can query for context-specific recommendations, such as "What are the top 10 most popular R packages for data manipulation?".	Accelerates the discovery phase of code-first statistical analysis, ensuring researchers select approved packages.
Instant Package Details	For both public and internally developed packages, easily retrieve key package information, metadata, version history, and documentation highlights.	Streamlines project development by providing immediate technical reference needed for analysis or sharing results.
Binary Availability Checks	Quickly check if platform-specific binaries (e.g., Windows binaries for Rcpp) are available, along with installation instructions.	Enables users to avoid compilation delays on their local machines, dramatically speeding up the setup of reproducible analysis environments.
Vulnerability Checks	Identify if your current project uses any packages with known vulnerabilities.	Enables users to ensure safe research and data science projects before issues arise.



MCP Server for Package Manager

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Check the package 'ggplot2' – does it have any known vulnerabilities?

R 4.5.2

Positron Assistant

- ✓ Ran `get_repos` – pm-mcp-server (MCP Server)
- ✓ Ran `get_vulns_list` – pm-mcp-server (MCP Server)

Good news – **ggplot2 has no known vulnerabilities** in the CRAN vulnerability database.

The vulnerability scan covers these packages:

- `commonmark` (DoS vulnerabilities, fixed in 1.8)
- `gdata` (ACE vulnerability, fixed in 3.0.0)
- `gh` (ACE vulnerability, fixed in 1.5.0)
- `haven` (memory issues, fixed in 1.1.1)
- `igraph` (NULL pointer dereference, fixed in 1.2.2-2)
- `jsonlite` (memory leak, fixed in 1.8.8)
- `plotly` (prototype pollution, fixed in 4.12.0)
- `png` (buffer overflow on older Windows R, fixed in 0.1-9)
- `readxl` (multiple memory corruption issues, fixed in 1.4.2)
- `widgetFrame` (CSRF, no fix yet)

ggplot2 is not on this list, so it's safe to use. You can check your installed version:

```
packageVersion("ggplot2")
```

qwen3.6-plus

"In my environment, is there a pre-built Windows binary available for 'data.table'?"

R 4.5.2

Positron Assistant

- ✓ Ran `get_package_binaries` – pm-mcp-server (MCP Server)
- ✓ Ran `get_repo_binaries` – pm-mcp-server (MCP Server)

Yes, a **Windows binary entry exists for `data.table` 1.18.4** in the CRAN repository for **R 4.5 on x86_64 Windows**.

However, the binary record fields (checksum, ash) are empty, which can mean the binary is registered but not yet fully built or available for download. Since `data.table` requires compilation (`needs_compilation: yes`), you may fall back to building from source if the binary isn't ready.

You can try installing it and R will attempt the binary first:

```
install.packages("data.table")
```

Or explicitly request only a binary (no compilation):

```
install.packages("data.table", type = "binary")
```

If the binary isn't available yet, the second command will fail with a warning, and you'll need Rtools installed to compile from source.

qwen3.6-plus



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Data Security in AI



Real Question from Users

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Question: In our daily work, we often handle sensitive or personal data. While the syntax, names, and structure of our data objects are not considered sensitive, the content of `data.frames` (e.g., values exposed via `glimpse()`) may contain highly sensitive information.



Data Content Transmission

Official statement: "Positron Assistant does not have the infrastructure to send the entire dataset to the model provider."



Tool Calling and Schema

Official statement: "But it can use 'tool calls' to send the schema of the dataset."



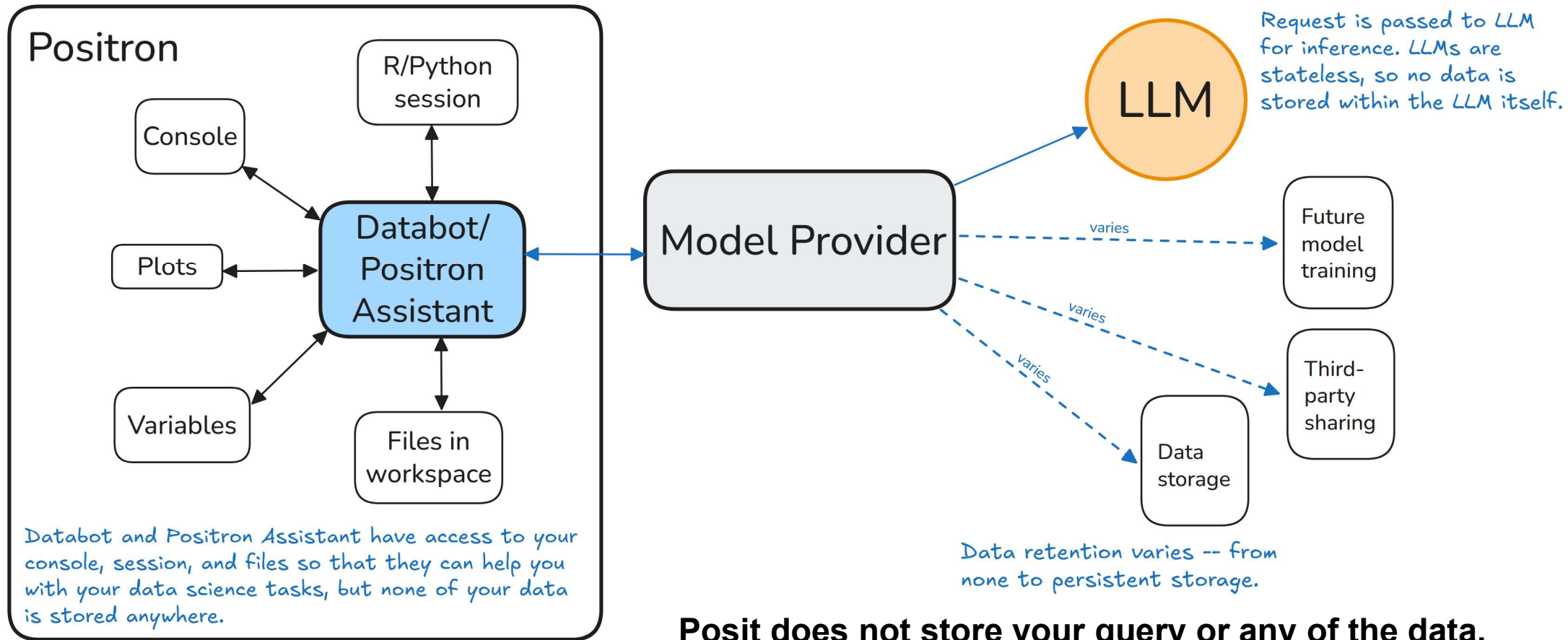
Opt-Out & Console Context Control

Positron Assistant supports explicit opt-out of specific tool calls and configurable [console context access](#) to protect data schema and user privacy.



Posit with LLM

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Posit does not store your query or any of the data.

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THANK YOU!