



Creación de un Sistema Experto (G2)

Sistemas Inteligentes

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Resumen

En el siguiente trabajo se pretende explicar el proceso realizado para crear un sistema experto utilizando la herramienta G2. La idea es que el sistema emule las funciones de un agente inmobiliario en donde, a partir de un conjunto de preguntas que se le harán al usuario se generarán recomendaciones asociadas a las respuestas. Se tendrán en cuenta características como tipo y estado del inmueble.

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Introducción

G2 es una herramienta que ayuda a crear sistemas basados en reglas, lo que permite crear, implementar y adaptar aplicaciones expertas basadas en reglas y en tiempo real que automatizan la toma de decisiones.

Los sistemas expertos o sistemas basados en conocimiento son capaces de aprender, adaptarse, predecir y, en algunos casos, operar de forma autónoma. Estos sistemas son programas informáticos que utilizan reglas de inferencia y bases de conocimiento para resolver problemas o tomar decisiones en un área específica.

Su inteligencia se deriva de su capacidad para procesar grandes cantidades de datos, reconocer patrones y tomar decisiones basadas en la información disponible.

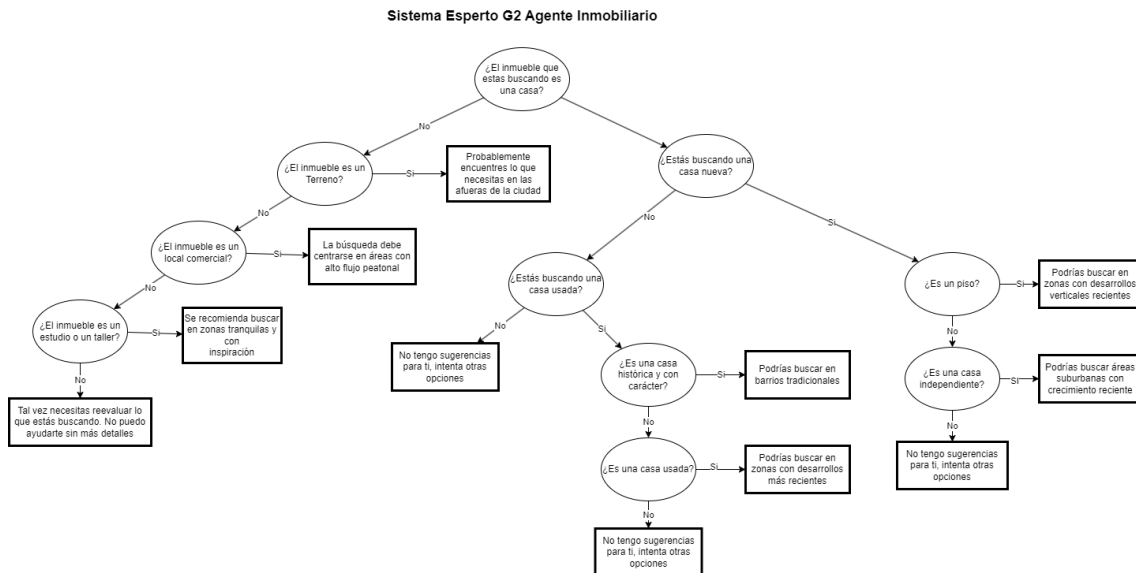
Para crear un sistema experto se necesita de una base de conocimiento que contiene la información sobre un dominio específico que incluye hechos, reglas, casos de ejemplo y modelos. También, un motor de inferencia, que es un componente que aplica las reglas de inferencia a la base de conocimiento para derivar nuevas conclusiones o tomar decisiones y se basa en la retroalimentación y aprendizaje.

Método

1. Descripción del ejercicio

Un agente inmobiliario: El sistema experto supremo en la búsqueda de la casa ideal. ¿Quién no ha soñado con encontrar la casa perfecta y se ha sentido abrumado por dónde empezar? En esos momentos de incertidumbre, muchas personas recurren a un agente inmobiliario para decir: "¿No tendrás alguna casa que se ajuste a lo que busco?" Y tras seguir sus recomendaciones, esa casa ideal parece aparecer como por arte de magia. Pues bien, ese conocimiento que solo un agente inmobiliario experimentado posee es el ejemplo perfecto de un sistema EXPERTO. Una sabiduría forjada a partir de la experiencia y de un entendimiento profundo del mercado inmobiliario.

2. Modelo causal o de pericia



3. Reglas

initially in order show `tipo_inmueble_ask` at the center of the screen and conclude that the `casa` of agente is none and conclude that the `casa_nueva` of agente is none and conclude that the `casa_segunda_mano` of agente is none and conclude that the `terreno` of agente is none and conclude that the `local_comercial` of agente is none and conclude that the `espacio_especifico` of agente is none and conclude that the `ninguno` of agente is none and conclude that the `piso` of agente is none and conclude that the `casa_indp` of agente is none and conclude that the `casa_historica` of agente is none and conclude that the `casa_moderna` of agente is none

whenever casa_var receives a value then conclude that the casa of agente = the value of casa_var

whenever casa_nueva_var receives a value then conclude that the casa_nueva of agente = the value of casa_nueva_var

whenever casa_segunda_mano_var receives a value then conclude that the casa_segunda_mano of agente = the value of casa_segunda_mano_var

whenever terreno_var receives a value then conclude that the terreno of agente = the value of terreno_var

whenever local_comercial_var receives a value then conclude that the local_comercial of agente = the value of local_comercial_var

whenever casa_historica_var receives a value then conclude that the casa_historica of agente = the value of casa_historica_var

whenever casa_indp_var receives a value then conclude that the casa_indp of agente = the value of casa_indp_var

whenever piso_var receives a value then conclude that the piso of agente = the value of piso_var

whenever espacio_especifico_var receives a value then conclude that the espacio_especifico of agente = the value of espacio_especifico_var

whenever ninguno_var receives a value then conclude that the ninguno of agente = the value of ninguno_var

whenever casa_moderna_var receives a value then conclude that the casa_moderna of agente = the value of casa_moderna_var

whenever the casa of agente receives a value and when the casa of agente is true then show estado_casa_ask at the center of the screen

whenever the casa_nueva of agente receives a value and when the casa_nueva of agente is true then show piso_ask at the center of the screen

whenever the piso of agente receives a value and when the piso of agente is false then show casa_indp_ask at the center of the screen

whenever the casa_nueva of agente receives a value and when the casa_nueva of agente is false then show casa_hist_ask at the center of the screen

whenever the casa_historica of agente receives a value and when the casa_historica of agente is false then show casa_moderna_ask at the center of the screen

whenever the casa of agente receives a value and when the casa of agente is false then show terreno_ask at the center of the screen

whenever the terreno of agente receives a value and when the terreno of agente is false then show local_comercial_ask at the center of the screen

whenever the espacio_especifico of agente receives a value and when the espacio_especifico of agente is true then inform the operator on the subworkspace of agente that "Se recomienda buscar en lugares tranquilos y con inspiracion" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the espacio_especifico of agente receives a value and when the espacio_especifico of agente is true then inform the operator on the subworkspace of agente that "Se recomienda buscar en lugares tranquilos y con inspiracion" and

show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the local_comercial of agente receives a value and when the local_comercial of agente is true then inform the operator on the subworkspace of agente that "La búsqueda se debe centrarse en áreas con alto flujo peatonal" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the terreno of agente receives a value and when the terreno of agente is true then inform the operator on the subworkspace of agente that "Probablemente encuentres lo que necesitas en las afueras de la ciudad" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_moderna of agente receives a value and when the casa_moderna of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en zonas con desarrollos más recientes." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_moderna of agente receives a value and when the casa_moderna of agente is false then inform the operator on the subworkspace of

agente that "No tengo sugerencias para ti, intenta otras opciones." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the piso of agente receives a value and when the piso of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en zonas con desarrollos verticales recientes" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_indp of agente receives a value and when the casa_indp of agente is true then inform the operator on the subworkspace of agente that "Busca Areas Suburbanas con crecimiento reciente." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_indp of agente receives a value and when the casa_indp of agente is false then inform the operator on the subworkspace of agente that "No tengo sugerencias para ti, intenta otras opciones." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_segunda_mano of agente receives a value and when the casa_segunda_mano of agente is true then show casa_hist_modern_ask at the center of the screen

whenever the casa_historica of agente receives a value and when the casa_historica of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en barrios tradicionales" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the espacio_especifico of agente receives a value and when the espacio_especifico of agente is false then inform the operator on the subworkspace of agente that "Tal vez necesitas reevaluar lo que estás buscando. No puedo ayudarte sin más detalles." and show the subworkspace of agente at the center of the screen and pause knowledge-base

4. Resultado Gensym G2

REGLAS

REGLAS

initially in order show tipo_inmueble_ask at the center of the screen and conclude that the casa_of agente is none and conclude that the casa_nueva_of agente is none and conclude that the casa_segunda_mano_of agente is none and conclude that the terreno_of agente is none and conclude that the local_comercial_of agente is none and conclude that the ninguno_of agente is none and conclude that the piso_of agente is none and conclude that the casa_indp_of agente is none and conclude that the casa_historia_of agente is none and conclude that the casa_moderna_of agente is none

whenever casa_var receives a value then conclude that the casa_of agente = the value of casa_var

whenever casa_nueva_var receives a value then conclude that the casa_nueva_of agente = the value of casa_nueva_var

whenever casa_segunda_mano_var receives a value then conclude that the casa_segunda_mano_of agente = the value of casa_segunda_mano_var

whenever terreno_var receives a value then conclude that the terreno_of agente = the value of terreno_var

whenever local_comercial_var receives a value then conclude that the local_comercial_of agente = the value of local_comercial_var

whenever casa_historia_var receives a value then conclude that the casa_historia_of agente = the value of casa_historia_var

whenever casa_indp_var receives a value then conclude that the casa_indp_of agente = the value of casa_indp_var

whenever piso_var receives a value then conclude that the piso_of agente = the value of piso_var...

whenever espacio_especifico_var receives a value then conclude that the espacio_especifico_of agente = the value of espacio_especifico_var

whenever ninguno_var receives a value then conclude that the ninguno_of agente = the value of ninguno_var

whenever casa_moderna_var receives a value then conclude that the casa_moderna_of agente = the value of casa_moderna_var

whenever the casa_of agente receives a value and when the casa_of agente is true then show estado_casa_ask at the center of the screen

whenever the casa_nueva_of agente receives a value and when the casa_nueva_of agente is true then show piso_ask at the center of the screen

whenever the piso_of agente receives a value and when the piso_of agente is false then show casa_indp_ask at the center of the screen

whenever the casa_nueva_of agente receives a value and when the casa_nueva_of agente is false then show casa_hist_ask at the center of the screen

whenever the casa_historia_of agente receives a value and when the casa_historia_of agente is false then show casa_moderna_ask at the center of the screen

whenever the casa_of agente receives a value and when the casa_of agente is false then show terreno_ask at the center of the screen

whenever the terreno_of agente receives a value and when the terreno_of agente is false then show local_comercial_ask at the center of the screen

whenever the local_comercial_of agente receives a value and when the local_comercial_of agente is false then show estudio_taller_ask at the center of the screen

whenever the espacio_especifico_of agente receives a value and when the espacio_especifico_of agente is true then inform the operator on the subworkspace of agente that "Se recomienda buscar en lugares tranquilos y con inspiración" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the local_comercial_of agente receives a value and when the local_comercial_of agente is true then inform the operator on the subworkspace of agente that "La búsqueda se debe centrarse en áreas con alto flujo peatonal" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the terreno_of agente receives a value and when the terreno_of agente is true then inform the operator on the subworkspace of agente that "Probablemente encuentres lo que necesitas en las afueras de la ciudad" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_moderna_of agente receives a value and when the casa_moderna_of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en zonas con desarrollos más recientes" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_moderna_of agente receives a value and when the casa_moderna_of agente is false then inform the operator on the subworkspace of agente that "No tengo sugerencias para ti, intenta otras opciones." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the piso_of agente receives a value and when the piso_of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en zonas con desarrollos verticales recientes" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_indp_of agente receives a value and when the casa_indp_of agente is true then inform the operator on the subworkspace of agente that "Busca Áreas Suburbanas con crecimiento reciente" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_indp_of agente receives a value and when the casa_indp_of agente is false then inform the operator on the subworkspace of agente that "No tengo sugerencias para ti, intenta otras opciones." and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the casa_segunda_mano_of agente receives a value and when the casa_segunda_mano_of agente is true then show casa_hist_modern_ask at the center of the screen

whenever the casa_historia_of agente receives a value and when the casa_historia_of agente is true then inform the operator on the subworkspace of agente that "Podrías buscar en barrios tradicionales" and show the subworkspace of agente at the center of the screen and pause knowledge-base

whenever the espacio_especifico_of agente receives a value and when the espacio_especifico_of agente is false then inform the operator on the subworkspace of agente that "Tal vez necesitas reevaluar lo que estás buscando. No puedo ayudarte sin más detalles." and show the subworkspace of agente at the center of the screen and pause knowledge-base

5. Workspaces

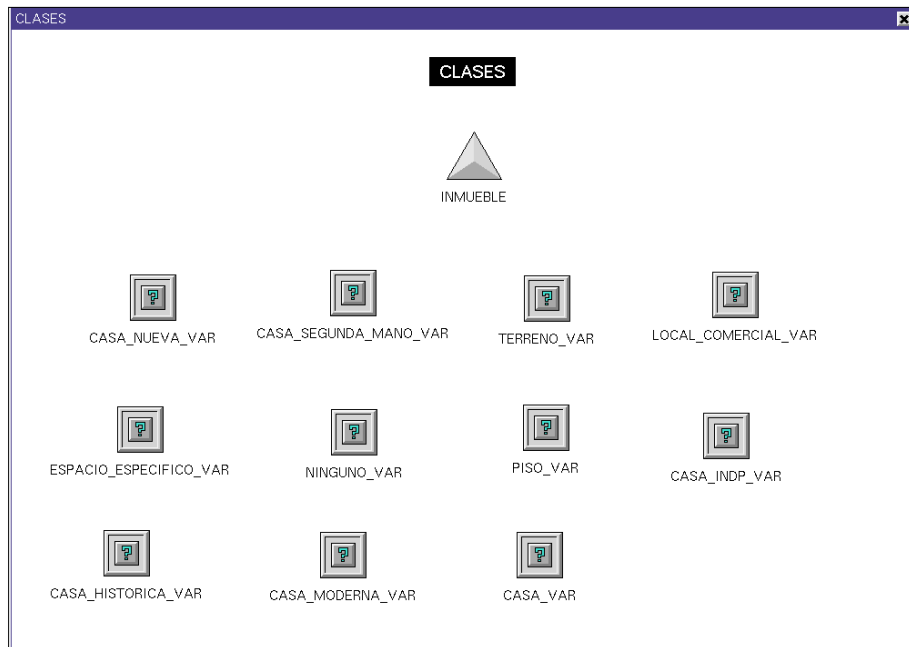
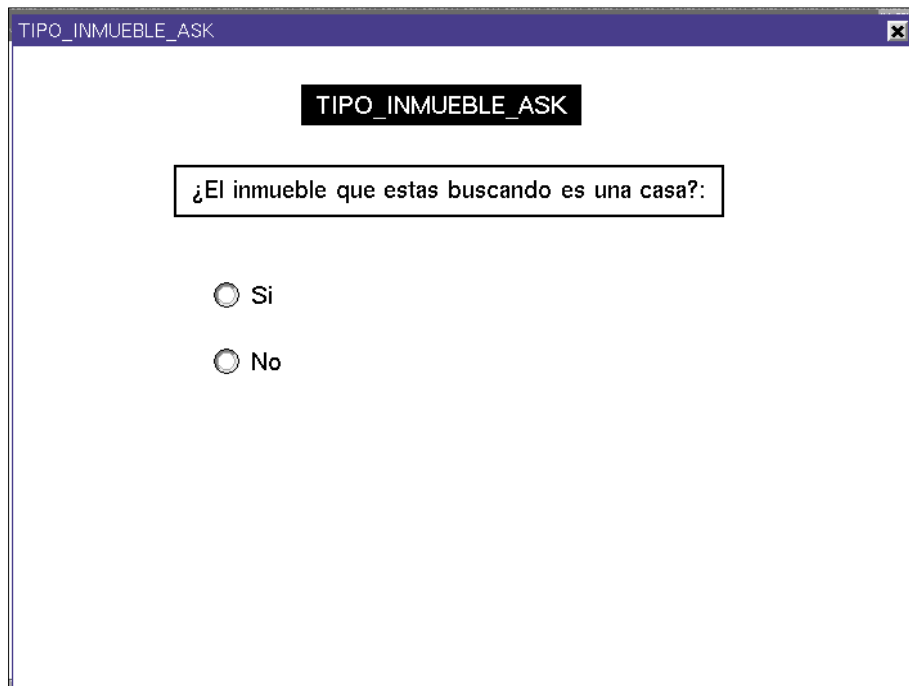


Imagen 1 Workspace CLASES



Imagen 2 Workspace OBJECTS



TIPO_INMUEBLE_ASK

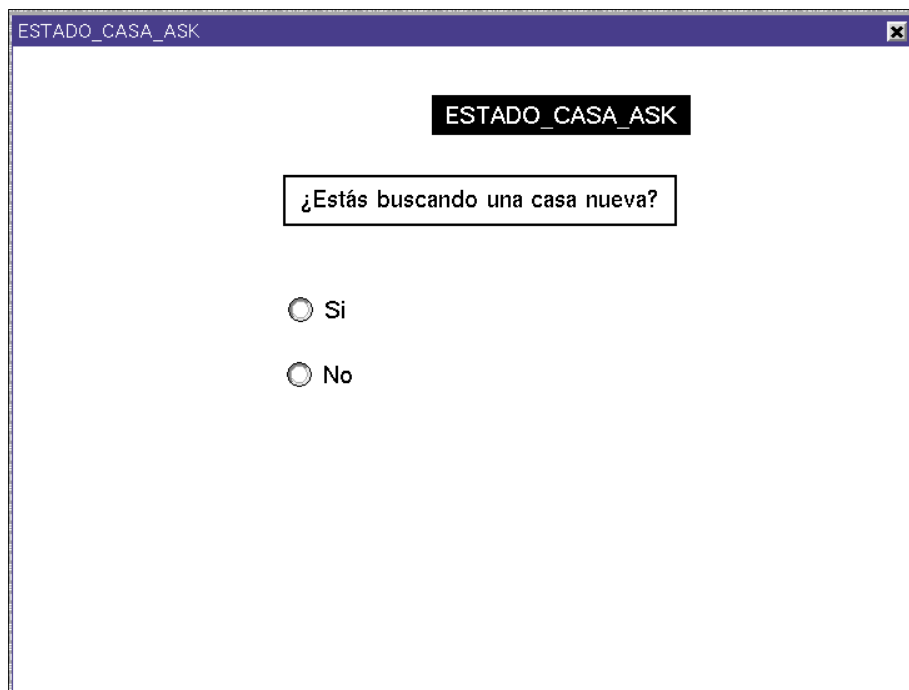
TIPO_INMUEBLE_ASK

¿El inmueble que estas buscando es una casa?:

☐ Si

☐ No

Imagen 3 Workspace TIPO_INMUEBLE_ASK



ESTADO_CASA_ASK

ESTADO_CASA_ASK

¿Estás buscando una casa nueva?


☐ Si


☐ No


Imagen 4 Workspace ESTADO_CASA_ASK


CLASES


CLASES



INMUEBLE



CASA_NUEVA_VAR


CASA_SEGUNDA_MANO_VAR


ESPACIO_ESPECIFICO_VAR


NINGUNO_VAR


CASA_HISTORICA_VAR


CASA_MODERNA_VAR


INMUEBLE, a class-definition


Notes	OK
Authors	ale12 (19 Apr 2024 7:53 p.m.)
Change log	0 entries
Item configuration	none
Class name	inmueble
Direct superior classes	object
Class specific attributes	casa initially is none; casa_nueva initially is none; casa_segunda_mano initially is none; terreno initially is none; local_comercial initially is none; espacio_especifico initially is none; ninguno initially is none; piso initially is none; casa_indp initially is none; casa_historica initially is none; casa_moderna initially is none
Instance configuration	none
Change	none
Instantiate	yes
Include in menus	yes
Class inheritance path	inmueble, object, item
Inherited attributes	none
Initializable system attributes	attribute-displays, stubs
Attribute initializations	none
Icon description	inherited


Imagen 5 Tabla de la Clase INMUEBLE


CLASES


CLASES



INMUEBLE


CASA_NUEVA_VAR


LOCAL_COMERCIAL_VAR


ESPACIO_ESPECIFICO_VAR


CASA_HISTORICA_VAR


CASA_INDP_VAR

CASA_NUEVA_VAR, a logical-variable

Options	do forward chain, breadth first backward chain
Notes	OK
Item configuration	none
Names	CASA_NUEVA_VAR
Tracing and breakpoints	default
Data type	truth value
Initial value	none
Last recorded value	no value
History keeping spec	do not keep history
Validity interval	supplied
Formula	none
Simulation details	no simulation formula yet
Initial value for simulation	default
Data server	inference engine
Default update interval	none

Imagen 6 Tabla de la variable CASA_NUEVA_VAR


OBJECTS																													
<div>OBJECTS</div> <div>  AGENTE </div>																													
<div>AGENTE, an inmueble</div> <table> <tr> <td>Notes</td><td>OK</td></tr> <tr> <td>Item configuration</td><td>none</td></tr> <tr> <td>Names</td><td>AGENTE</td></tr> <tr> <td>Casa</td><td>true</td></tr> <tr> <td>Casa_nueva</td><td>true</td></tr> <tr> <td>Casa_segunda_mano</td><td>none</td></tr> <tr> <td>Terreno</td><td>none</td></tr> <tr> <td>Local_comercial</td><td>none</td></tr> <tr> <td>Espacio_especifico</td><td>none</td></tr> <tr> <td>Ninguno</td><td>none</td></tr> <tr> <td>Piso</td><td>false</td></tr> <tr> <td>Casa_indp</td><td>true</td></tr> <tr> <td>Casa_historica</td><td>none</td></tr> <tr> <td>Casa_moderna</td><td>none</td></tr> </table>		Notes	OK	Item configuration	none	Names	AGENTE	Casa	true	Casa_nueva	true	Casa_segunda_mano	none	Terreno	none	Local_comercial	none	Espacio_especifico	none	Ninguno	none	Piso	false	Casa_indp	true	Casa_historica	none	Casa_moderna	none
Notes	OK																												
Item configuration	none																												
Names	AGENTE																												
Casa	true																												
Casa_nueva	true																												
Casa_segunda_mano	none																												
Terreno	none																												
Local_comercial	none																												
Espacio_especifico	none																												
Ninguno	none																												
Piso	false																												
Casa_indp	true																												
Casa_historica	none																												
Casa_moderna	none																												

Imagen 7 Tabla del objeto AGENTE

Lista de referencias

[GENSYM G2](#)

[Sistemas Inteligentes](#)

[Introducción a GENSYM G2](#)

[G2 Reference Manual and Tutorials](#)