Overview of the demo environment

Atlas

Knowledge Base
MyClient

Simulation
Lobby

Emily @ 3Hz

Willie

MyHouse

Knowledge Base
- MyObject
- MyDoor
- MyLight
- MyScene
- MyWindow
- MyCamera
- MyConsole

Simulation @ 240Hz
Kitchen

Cook Bot

Jimmy the Cook

MyApp.exe

```
Atlas.Create(config_
    string,
    manifest_name,
    script_name);
```

manifest_name: my_client_manifest.txt

script_name: my_client_script.txt

manifest_name: my_kitchen_manifest.txt

script_name: my_kitchen_script.txt

Legend

Domain	Knowledge Base	Concept	Simulation	Zone	Atlas Clone	Context Agent	Context Agent

1. The example application, *MyApp*, requests that a manifest be loaded into the Atlas domain:

```
Atlas.Create(config_string, manifest_name, script_name);
```

2. MyClient concept is learned, from the supplied manifest, soon after the Atlas domain is created:

```
/Learn "Client" "MyClient/MyClient" "MyClient"
```

3. A new instance of the MyClient concept is created when the client script is executed:

```
/Create Client "Kitchen Demo"
```

4. Once the instance is created, the script starts the demo:

```
/Start the kitchen demo
```

5. During the start method, MyClient axiom creates a new context agent named *Willie* to be hosted by an Atlas clone named *Emily*. Emily will run at 3Hz. Willie immediately enters the *Lobby* zone in the *Atlas* domain:

```
CreateActiveAgentAndClone("Willie", "Emily", "Atlas", "Lobby", 3.0f)
```

6. Willie then creates a new domain, named *House*, with an initial zone named *Kitchen:*

```
Domain->Create(m_clientbot.reference, "House", "Kitchen", 2)
```

Willie

Emily @ 3Hz
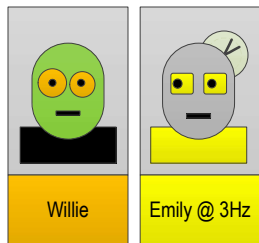
7. Willie then creates another context agent, named *Jimmy the Cook*, to be hosted by a new Atlas clone named *Cook Bot*. Unlike Emily, Cook Bot will not run at any specific frequency and will always be exclusively available to Jimmy's requests. Jimmy the Cook enters the *Kitchen* zone of the *House* domain:

```
CreatePassiveAgentAndClone("Jimmy the Cook", "Cook Bot", "House", "Kitchen")
```

8. Willie starts a simulation inside the House domain, running at 240Hz. The simulation will be responsible for managing all spatial-temporal interpolations and events of the instances in the domain:

```
Domain->StartSimulation(m_clientbot.reference, 240.0f, 5, 3)
```

9. Willie finally populates the new House domain by loading the kitchen manifest and executing the kitchen script:
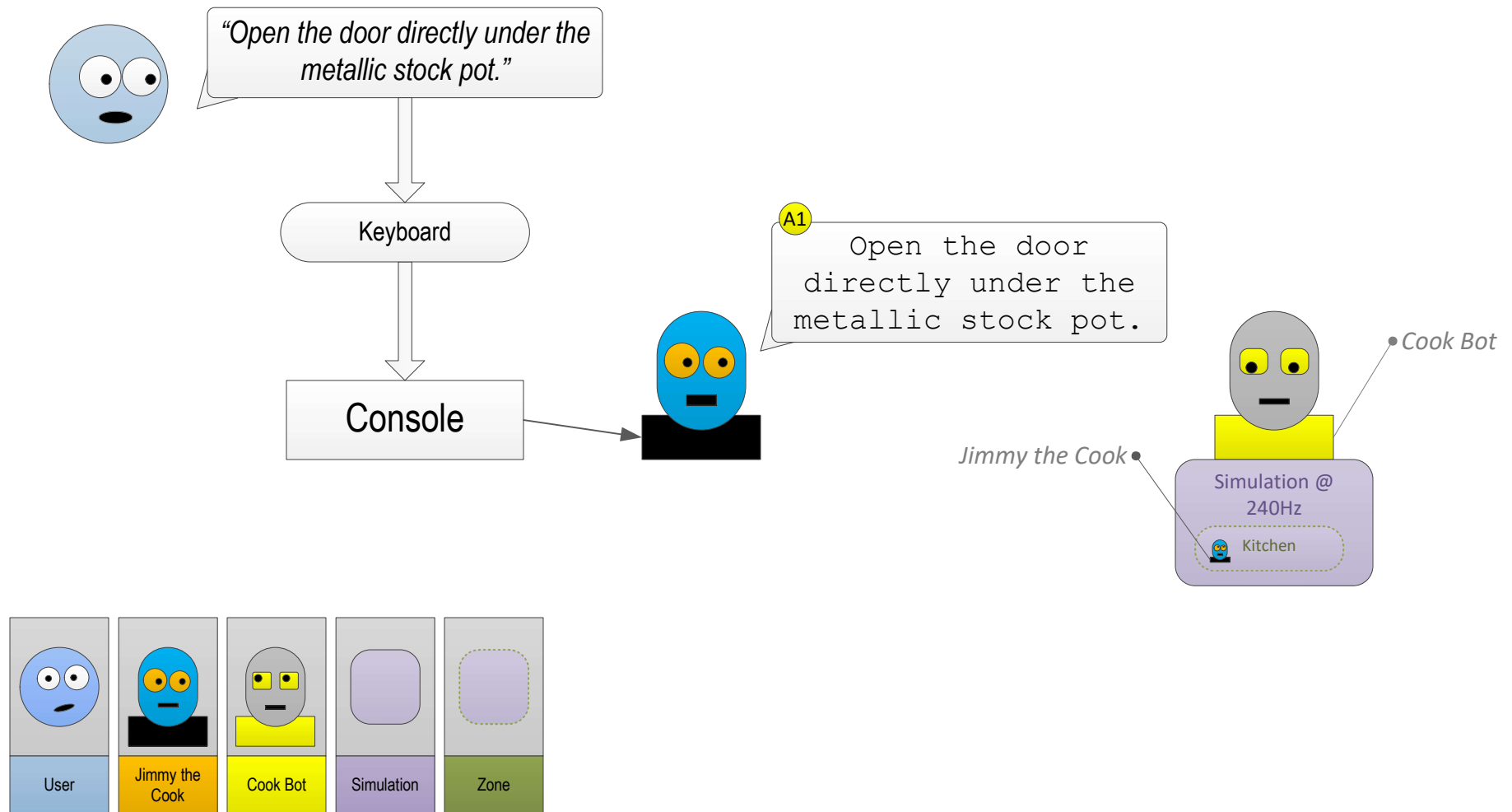
Domain->LoadManifest(m_jimmy.reference, **manifest_name**)

```
Agent->ExecuteScript(m_jimmy.reference, script_name)
```

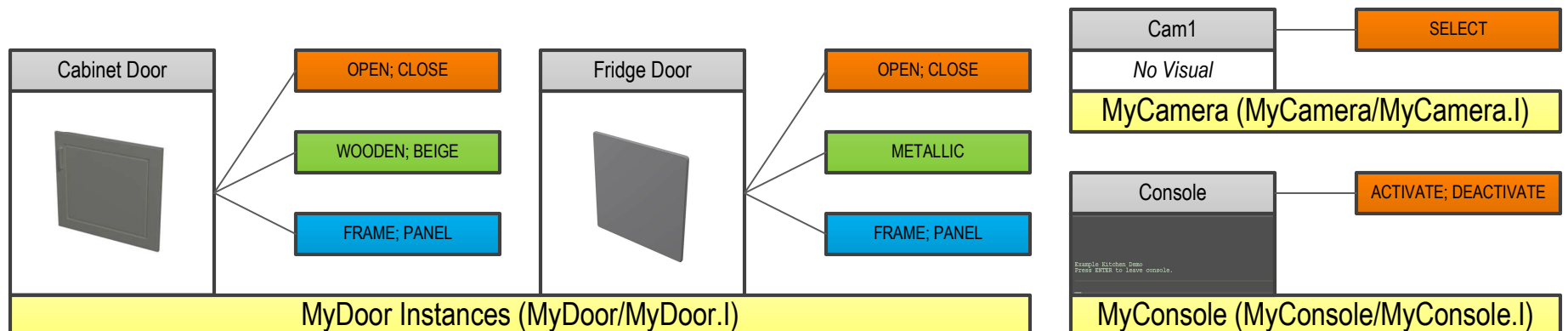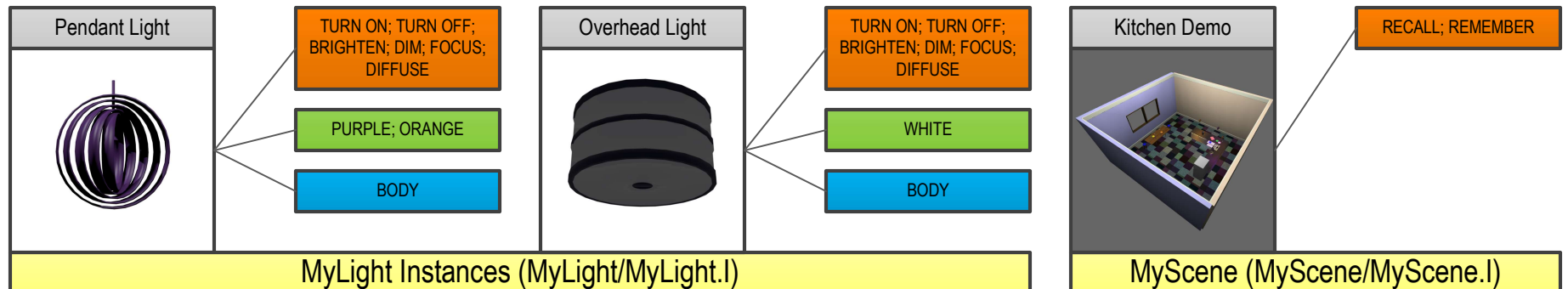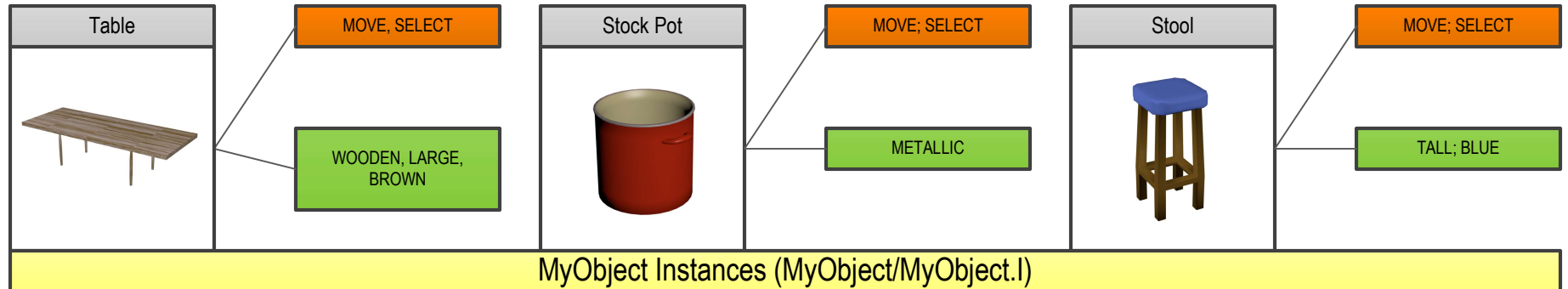| Willie	Emily @ 3Hz	Jimmy the Cook	Cook Bot
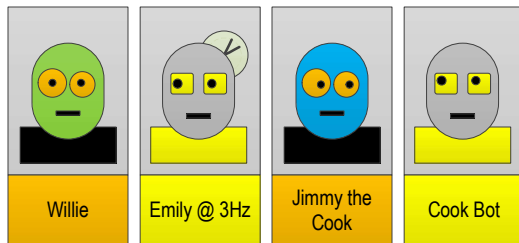
- Since Atlas has no concept of users. A user is represented in this demo by a console hosted by Jimmy the Cook.
- The console is a text interface that intercepts key strokes and *Tells* (A1) its hosting clone (Cook Bot) NLP statements when the ENTER key is pressed.
- The Atlas clone, in turn, probes and changes the state of the simulation.

"Open the door directly under the metallic stock pot."

Keyboard

Console

(A1)
```
Open the door
directly under the
metallic stock pot.
```

Cook Bot

Jimmy the Cook

Simulation @ 240Hz

Kitchen

User	Jimmy the Cook	Cook Bot	Simulation	Zone

Kitchen scene instances

The following list describes example concepts included in the demo and some of their instances with their assigned `DO` `BE` `HAVE`

Table	MOVE, SELECT
	WOODEN, LARGE, BROWN

Stock Pot	MOVE; SELECT
	METALLIC

Stool	MOVE; SELECT
	TALL; BLUE

MyObject Instances (MyObject/MyObject.I)

Pendant Light	TURN ON; TURN OFF; BRIGHTEN; DIM; FOCUS; DIFFUSE
	PURPLE; ORANGE
	BODY

Overhead Light	TURN ON; TURN OFF; BRIGHTEN; DIM; FOCUS; DIFFUSE
	WHITE
	BODY

MyLight Instances (MyLight/MyLight.I)

Kitchen Demo	RECALL; REMEMBER

MyScene (MyScene/MyScene.I)

Cabinet Door	OPEN; CLOSE
	WOODEN; BEIGE
	FRAME; PANEL

Fridge Door	OPEN; CLOSE
	METALLIC
	FRAME; PANEL

MyDoor Instances (MyDoor/MyDoor.I)

Cam1	SELECT
No Visual	

MyCamera (MyCamera/MyCamera.I)

Console	ACTIVATE; DEACTIVATE

Example Kitchen Demo
Press ENTER to leave console.

**MyConsole (MyConsole/MyConsole.I)**

About spatial relations

- Currently, Atlas computes spatial relations based on the instance and camera origins only. It does not take into account the simulated object shapes or bounding boxes. This feature will be upgraded when the Simulation Object interface `AtlasAttributeShapeAPI` is exposed. For example, in the picture below, the pot is located directly above the door but their origins are not above each other.

Give it a try!
Try opening the door below the pot by saying "Open the door immediately below the pot"; move the pot around, and try again.

User

Jimmy the Cook

Cook Bot
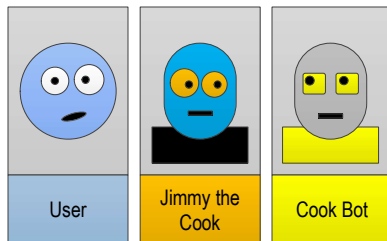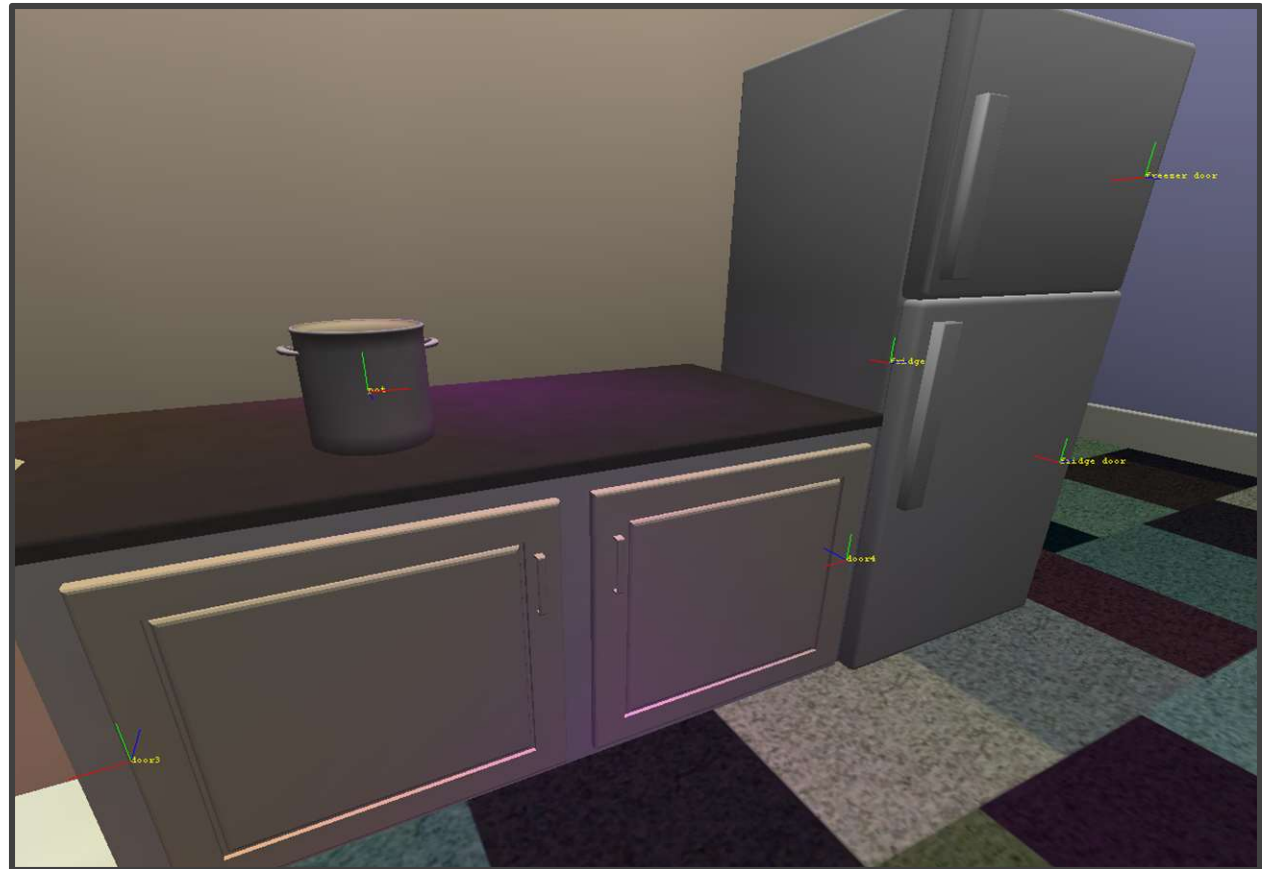
Shapes & Sizes

The following shape types are available to all simulation objects:

square, rectangle, parallelogram, circle, semicircle, oval, triangle, pentagon, hexagon, heptagon, octagon, cone, cube, cylinder, pyramid, sphere, disc, diamond, heart, kite, star, spiral, bent, curved, wavy, angular, symmetrical, bulbous, concave, convex, flat, round, forked, pointy, tapered, twisted, thick, thin, circular, cubic, cylindrical, conical, smooth

The following size types are available to all simulation objects:

gigantic, colossal, short, scrawny, puny, miniature, mammoth, teeny, tiny, little, small, large, huge, big, tall, long, fat, straight, fuzzy, blurry, sharp, steep, square, shallow, round, narrow, low, hollow, flat, high, deep, curved, crooked, chubby, broad, wide

Textures

The following textures are available to all simulation objects:

abrading, affected, angular, attractive, abrasive, affordable, arid, awkward, acute, bald, blistered, bouncy, bulky, ballooned, bloated, bristly, bumpy, barbed, blunt, broad, burning, bendable, boiling, bubbly, burnished, biting, bolstered, bulging, bushy, blemished, caked, clammy, cool, crawly, caressing, clean, copious, creepy, carved, clear, corduroy, crenelated, chafing, corrugated, crocheted, channeled, coagulated, cosy, crude, chapped, coarse, cottony, cushioned, cheap, coated, cut, cheerful, cold, cheery, concentrated, covering, cutting, chunky, confused, cratered, damaged, definite, dirty, dripping, damp, dehydrated, discoloration, dry, dank, dense, disfigured, defined, dented, distended, ductile, decorated, diaphanous, downy, dull, deep, difficult, dreary, durable, defective, drenched, dusty, effective, enameled, engraved, even, elastic, encrusted, enlarged, expanded, emblazoned, engorged, etched, extreme, embossed, fatty, firm, flawless, fresh, feathery, fizzy, fleecy, frigid, fiery, flaky, fluffy, frothy, filmy, flat, fluted, furred, filthy, foamy, furry, fine, flattened, freezing, fuzzy, finished, flawed, gelatinous, gooey, gravelly, gritty, glassy, gossamer, grimy, grooved, glazed, grainy, grinding, grubby, glossy, granular, gripped, grungy, glutinous, grating, hairy, hatched, hoarse, hard, hazy, honed, honeyed, humid, harsh, heated, hot, hygienic, icy, imprinted, inflexible, inviting, incised, inlaid, ironed, immaculate, incisive, inscribed, irregular, impenetrable, inserted, itchy, imperfect, indented, inset, ivory, imprecise, inflated, jagged, jarring, jumbled, keen, knitted, knobbed, layered, limp, longhaired, lustrous, level, lined, lustreless, malleable, mellifluous, moist, mushy, marked, metallic, mosaic, muted, matte, mild, mucky, mutilated, neat, numbing, nonglossy, orderly, ornamented, padded, pitted, pointy, printed, parched, pleated, polished, protected, patinated, pliable, potholed, puffed, patterned, pocked, precise, perfect, pockmarked, pressed, pulpy, piercing, pointed, prickly, pure, ragged, refined, ridged, runny, rasping, reflective, rigid, rutted, raw, restful, rocking, ribbed, rough, sandy, snarling, stain, sanitary, sheen, snug, stamped, saturated, sheer, soaked, steamed, scalding, shielded, soaking, steely, scaled, shiny, soapy, sterile, scarred, shipshape, sodden, stiff, scorching, silky, soft, still, scored, soggy, stinging, scraped, skin, soiled, stodgy, scratched, sleek, solid, strong, scratching, slick, sopping, stubbly, scratchy, slight, sound, substantial, sculptured, slimy, sparkling, supported, searing, slippery, spickandspan, sweltering, serrated, slovenly, spiky, swollen, set, smooth, spiny, syrupy, severe, spongy, shaggy, smoothed, spotless, sharp, smudged, springy, tarnished, thorny, tingly, transparent, tessellated, tickling, toothed, tweedy, thick, tidy, tough, thin, tiled, translucent, unadulterated, uncompromising, unexciting, untarnished, unblemished, unctuous, uninteresting, untidy, unbreakable, understated, unpolluted, unyielding, unclear, undulation, unsoiled, uncomfortable, uneven, untainted, vague, velvety, viscous, vivacious, varnished, veneered, warm, wholesome, wool, waterlogged, wide, woolen, wavy, wet, withered, woolly, welcoming, whetted, wooden, woven, yielding

The following colors are available to all simulation objects:

absolute zero, acid green, aero, aero blue, african violet, air superiority blue, alabaster, alice blue, alloy orange, almond, amaranth, m&p amaranth, amaranth pink, amaranth purple, amaranth red, amazon, amber, ece amber, amethyst, android green, antique brass, antique bronze, antique fuchsia, antique ruby, antique white, ao, apple green, apricot, aqua, aquamarine, arctic lime, army green, artichoke, arylide yellow, ash gray, asparagus, atomic tangerine, auburn, aureolin, avocado, azure, web azure, baby blue, baby blue eyes, baby pink, baby powder, baker-miller pink, banana mania, barbie pink, barn red, battleship grey, beau blue, beaver, beige, bedazzled blue, big dip o'ruby, bisque, bistre, bistre brown, bitter lemon, bitter lime, bittersweet, bittersweet shimmer, black, black bean, black chocolate, black coffee, black coral, black olive, black shadows, blanched almond, blast - off bronze, bleu de france, blizzard blue, blond, blood red, blue, crayola blue, munsell blue, ncs blue, pantone blue, pigment blue, ryb blue, blue bell, blue-gray, blue-green, color wheel blue-green, blue jeans,blue sapphire, blue-violet, crayola blue-violet, color wheel blue-violet, blue yonder, bluetiful, blush, bole, bone, bottle green, brandy, brick red, bright green, bright lilac, bright maroon, bright navy blue, crayola bright yellow, brilliant rose, brink pink, british racing green, bronze, brown, brown sugar, brunswick green, bud green, buff, burgundy, burlywood, burnished brown, burnt orange, burnt sienna, burnt umber, byzantine, byzantium, cadet, cadet blue, crayola cadet blue, cadet grey, cadmium green, cadmium orange, cadmium red, cadmium yellow, café au lait, café noir, cambridge blue, camel, cameo pink, canary, canary yellow, candy apple red, candy pink, capri, caput mortuum, cardinal, caribbean green, carmine, m&p carmine, carnation pink, carnelian, carolina blue, carrot orange, castleton green, catawba, cedar chest, celadon, celadon blue, celadon green, celeste, celtic blue, cerise, cerulean, cerulean blue, cerulean frost, crayola cerulean, cg blue, cg red, champagne, champagne pink, charcoal, charleston green, charm pink, traditional chartreuse, web chartreuse, cherry blossom pink, chestnut, china pink, china rose, chinese red, chinese violet, chinese yellow, traditional chocolate, web chocolate, chrome yellow, cinereous, cinnabar, cinnamon satin, citrine, citron, claret, cobalt blue, cocoa brown, coffee, columbia blue, congo pink, cool grey, copper, crayola copper, copper penny, copper red, copper rose, coquelicot, coral, coral pink, cordovan, corn, cornflower blue, cornsilk, cosmic cobalt, cosmic latte, coyote brown, cotton candy, cream, crimson, ua crimson, cultured, cyan, process cyan, cyber grape, cyber yellow, cyclamen, dark blue-gray, dark brown, dark byzantium, dark cornflower blue, dark cyan, dark electric blue, dark goldenrod, dark green, web dark green, dark jungle green, dark khaki, dark lava, dark liver, dark magenta, dark moss green, dark olive green, dark orange, dark orchid, dark pastel green, dark purple, dark red, dark salmon, dark sea green, dark sienna, dark sky blue, dark slate blue, dark slate gray, dark spring green, dark turquoise, dark violet, dartmouth green, davy's grey, deep cerise, deep champagne, deep chestnut, deep jungle green, deep pink, deep saffron, deep sky blue, deep space sparkle, deep taupe, denim, denim blue, desert, desert sand, dim gray, dodger blue, dogwood rose, drab, duke blue, dutch white, earth yellow, ebony, ecru, eerie black, eggplant, eggshell, egyptian blue, electric blue, electric green, electric indigo, electric lime, electric purple, electric violet, emerald, eminence, english green, english lavender, english red, english vermillion, english violet, erin, eton blue, fallow, falu red, fandango, fandango pink, fashion fuchsia, fawn, feldgrau, fern green, field drab, fiery rose, firebrick, fire engine red, fire opal, flame, flax, flickr blue, flickr pink, flirt, floral white, fluorescent blue, crayola forest green, traditional forest green, web forest green...
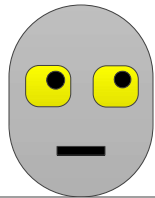
The following colors are available to all simulation objects:

french beige, french bistre, french blue, french fuchsia, french lilac, french lime, french mauve, french pink, french raspberry, french rose, french sky blue, french violet, frostbite, fuchsia, crayola fuchsia, fuchsia purple, fuchsia rose, fulvous, fuzzy wuzzy, gainsboro, gamboge, generic viridian, ghost white, glaucous, glossy grape, go green, gold, metallic gold, golden, crayola gold, gold fusion, golden brown, golden poppy, golden yellow, goldenrod, granite gray, granny smith apple, web gray, light gray, green, crayola green, web green, munsell green, ncs green, pantone green, pigment green, ryb green, green-blue, crayola green-blue, green-cyan, green lizard, green sheen, green-yellow, crayola green-yellow, grullo, gunmetal, han blue, han purple, hansa yellow, harlequin, harvest gold, heat wave, heliotrope, heliotrope gray, hollywood cerise, honeydew, honolulu blue, hooker's green, hot magenta, hot pink, hunter green, iceberg, icterine, illuminating emerald, imperial red, inchworm, independence, india green, indian red, indian yellow, indigo, indigo dye, international klein blue, aerospace orange, engineering orange, golden gate bridge orange, iris, irresistible, isabelline, italian sky blue, ivory, jade, jasmine, jazzberry jam, jet, jonquil, june bud, jungle green, kelly green, keppel, key lime, web khaki, light khaki, kobe, kobi, kobicha, kombu green, ksu purple, languid lavender, lapis lazuli, laser lemon, laurel green, lava, lavender, web lavender, lavender blue, lavender blush, lavender gray, lawn green, lemon, lemon chiffon, lemon curry, lemon glacier, lemon meringue, lemon yellow, crayola lemon yellow, liberty, light blue, light coral, light cornflower blue, light cyan, light french beige, light goldenrod yellow, light gray, light green, light orange, light periwinkle, light pink, light salmon, light sea green, light sky blue, light slate gray, light steel blue, light yellow, lilac, lilac luster, color wheel lime, web lime, lime green, lincoln green, linen, lion, liseran purple, little boy blue, liver, light liver, dark liver, liver chestnut, livid, macaroni and cheese, madder lake, magenta, crayola magenta, dye magenta, pantone magenta, process magenta, magenta haze, magic mint, magnolia, mahogany, maize, crayola maize, majorelle blue, malachite, manatee, mandarin, mango, mango tango, mantis, mardi gras, marigold, crayola maroon, web maroon, light maroon, mauve, mauve taupe, mauvelous, maximum blue, maximum blue green, maximum blue purple, maximum green, maximum green yellow, maximum purple, maximum red, maximum red purple, maximum yellow, maximum yellow red, may green, maya blue, medium aquamarine, medium blue, medium candy apple red, medium carmine, medium champagne, medium orchid, medium purple, medium sea green, medium slate blue, medium spring green, medium turquoise, medium iolet-red, mellow apricot, mellow yellow, melon, metallic gold, metallic seaweed, metallic sunburst, mexican pink, middle blue, middle blue green, middle blue purple, middle grey, middle green, middle green yellow, middle purple, middle red, middle red purple, middle yellow, middle yellow red, midnight, midnight blue, midnight green, mikado yellow, mimi pink, mindaro, ming, minion yellow, mint, mint cream, mint green, misty moss, misty rose, mode beige, morning blue, moss green, mountain meadow, mountbatten pink, msu green, mulberry, crayola mulberry, mustard, myrtle green, mystic, mystic maroon, nadeshiko pink, naples yellow, navajo white, navy blue, crayola navy blue, neon blue, neon green, new york pink, nickel, non-photo blue, nyanza, ocean blue, ocean green, ochre, old burgundy, old gold, old lace, old lavender, old mauve, old rose, old silver, olive, light olive drab, olive drab, olive green, olivine, onyx, opal, opera mauve, orange, crayola orange, pantone orange, web orange, orange peel, orange-red, crayola orange-red, orange soda, orange-yellow, crayola orange-yellow, orchid, orchid pink, crayola orchid, crayola outer space, outrageous orange, oxblood, oxford blue, ou crimson red, pacific blue, pakistan green, palatinate purple, pale aqua, pale cerulean, pale pink, pantone pale purple, pale silver, pale spring bud, pansy purple, paolo veronese green, papaya whip,paradise pink, paris green, pastel pink, patriarch, payne's grey, peach, crayola peach, peach puff, pear, pearly purple, periwinkle, crayola periwinkle, permanent geranium lake, persian blue, persian green, persian indigo, persian orange, persian pink, persian plum, persian red, persian rose, persimmon, pewter blue, phlox, phthalo blue, phthalo green, picotee blue, pictorial carmine...
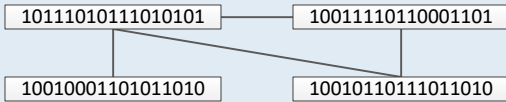
The following colors are available to all simulation objects:

piggy pink, pine green, pine tree, pink, pantone pink, pink flamingo, pink lace, pink lavender, pink sherbet, pistachio, platinum, plum, web plum, plump purple, polished pine, pomp and power, popstar, portland orange, powder blue, princeton orange, prune, prussian blue, psychedelic purple, puce, pullman brown, pumpkin, purple, web purple, munsell purple, light purple, purple mountain majesty, purple navy, purple pizzazz, purple plum, purpureus, queen blue, queen pink, quick silver, quinacridone magenta, radical red, raisin black, rajah, raspberry, raspberry glace, raspberry rose, raw sienna, raw umber, razzle dazzle rose, razzmatazz, razzmic berry, rebecca purple, red, crayola red, munsell red, ncs red, pantone red, pigment red, ryb red, red-orange, crayola red-orange, color wheel red-orange, red-purple, red salsa, red-violet, crayola red-violet, color wheel red-violet, redwood, resolution blue, rhythm, rich black, fogra29 rich black, fogra39 rich black, rifle green, robin egg blue, rocket metallic, roman silver, rose, rose bonbon, rose dust, rose ebony, rose madder, rose pink, rose quartz, rose red, rose taupe, rose vale, rosewood, rosso corsa, rosy brown, dark royal blue, light royal blue, royal purple, royal yellow, ruber, rubine red, ruby, ruby red, rufous, russet, russian green, russian violet, rust, rusty red, sacramento state green, saddle brown, safety orange, blaze orange, safety yellow, saffron, sage, st.patrick's blue, salmon, salmon pink, sand, sand dune, sandy brown, sap green, sapphire, sapphire blue, crayola sapphire, satin sheen gold, scarlet, schauss pink, school bus yellow, screamin' green, sea green, crayola sea green, seal brown, seashell, selective yellow, sepia, shadow, shadow blue, shamrock green, sheen green, shimmering blush, shiny shamrock, shocking pink, crayola shocking pink, sienna, silver, crayola silver, metallic silver, silver chalice, silver pink, silver sand, sinopia, sizzling red, sizzling sunrise, skobeloff, sky blue, crayola sky blue, sky magenta, slate blue, slate gray, slimy green, smitten, smoky black, snow,solid pink, sonic silver, space cadet, spanish bistre, spanish blue, spanish carmine, spanish gray, spanish green, spanish orange, spanish pink, spanish red, spanish sky blue, spanish violet, spanish viridian, spring bud, spring frost, spring green, crayola spring green, star command blue, steel blue, steel pink, steel teal, stil de grain yellow, straw, sugar plum, sunglow, sunray, sunset, super pink, sweet brown, tan, crayola tan, tangerine, tango pink, tart orange, taupe, taupe gray, tea green, tea rose, tea rose, teal, teal blue, telemagenta, tawny, terra cotta, thistle, thulian pink, tickle me pink, tiffany blue, timberwolf, titanium yellow, tomato, tropical rain forest, true blue, trypan blue, tufts blue, tumbleweed, turquoise, turquoise blue, turquoise green, turtle green, tuscan, tuscan brown, tuscan red, tuscan tan, tuscany, twilight lavender, tyrian purple, ua blue, ua red, ultramarine, ultramarine blue, ultra pink, ultra red, umber, unbleached silk, united nations blue, unmellow yellow, up forest green, up maroon, upsdell red, uranian blue, usafa blue, van dyke brown, vanilla, vanilla ice, vegas gold, venetian red, verdigris, vermilion, vermilion, veronica, violet, color wheel violet, crayola violet, ryb violet, web violet, violet-blue, crayola violet-blue, violet-red, viridian, viridian green, vivid burgundy, vivid sky blue, vivid tangerine, vivid violet, volt, warm black, wheat, white, wild blue yonder, wild orchid, wild strawberry, wild watermelon, windsor tan, wine, wine dregs, winter sky, wintergreen dream, wisteria, wood brown, xanthic, xanadu, xiketic, xylophone, yale blue, yellow, crayola yellow, munsell yellow, ncs yellow, pantone yellow, process yellow, ryb yellow, yellow-green, crayola yellow-green, color wheel yellow-green, yellow orange, color wheel yellow-orange, yellow sunshine, yinmn blue, zaffre, zomp
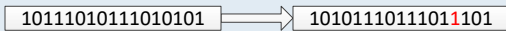
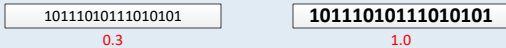**Set operations**

- Determiners
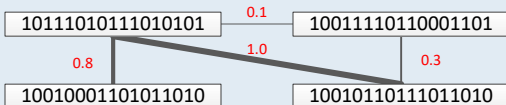- Countable states
- Countable relations
- Combinations: AND, OR, NOT, etc.

States and state relations

101110101110101010   100111101100011101

100100011010011010   100101101110111010

0004

State changes

10111010111010101 ⟶ 101011101110111101

Pronouns

- I, You, She, This, That, etc.

Temporal relations

- When, Before, After, During, etc.

State intensities

10111010111010101   **10111010111010101**

0.3   1.0

State relation intensities

10111010111010101   0.1   100111101100011101

0.8   1.0   0.3

100100011010011010   10010110111011010

State change intensities

10111010111010101   0.2   ⟶ 101011101110111101

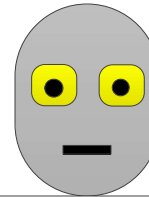10111010111010101   1.0   ⟶ 101011101110111101
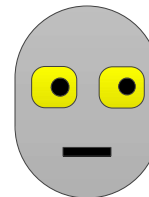
Conditions

- Antecedents: If, should, when, etc.
- Consequents: Then, therefore, otherwise, etc.
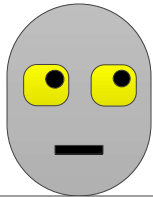
Causality

- Forward chaining
- Backward chaining
- Casual/Anti-causal chaining

Deeper pragmatics & hypotheticals

Sim 0:
"I pushed the glass off the table and it broke."
"It was cold and snowy day; he still made it to work."

Queries

- Subject → *Instance*
- Object → *Instance*
- Time → *Relation, Event*
- Space → *Relation*
- Causality → *Event*
- Goal/Rule → *Event*
- Count → *Value*
- Amount → *Value*
- Yes/No/0 → *Value*

Note that query results are Pinged directives. Generative text is left to the Context Agent. Titan will supply generative text examples to be expanded by the developer.