What do you Think when you Play

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Laboratory of Information Systems – LIS
Institute of Computing – UNICAMP
March 2015

Why we Play Games?

Preparing to Life?

Picture by Andrew Pescod
[https://www.flickr.com/photos/andrewpescod/2720809 26]

Life as a Game and Game Theory

PRISONER'S DILEMMA

C = cooperate

D = defect (don't cooperate)

YEARS IN PRISON	C	D
C	-1, -1	-10, 0
D	0, -10	-5, -5

Picture by Giulia Forsythe
[https://www.flickr.com/photos/gforsythe/8245423564/]

Uncertainty, strategy and trade-off are part of the Life and part of the Game

Cartoon by Geek & Poke
[http://geek-and-poke.com/geekandpoke/2014/4/26/prisoners-dilemma]

Game, Imagination and Creativity

Secret Door

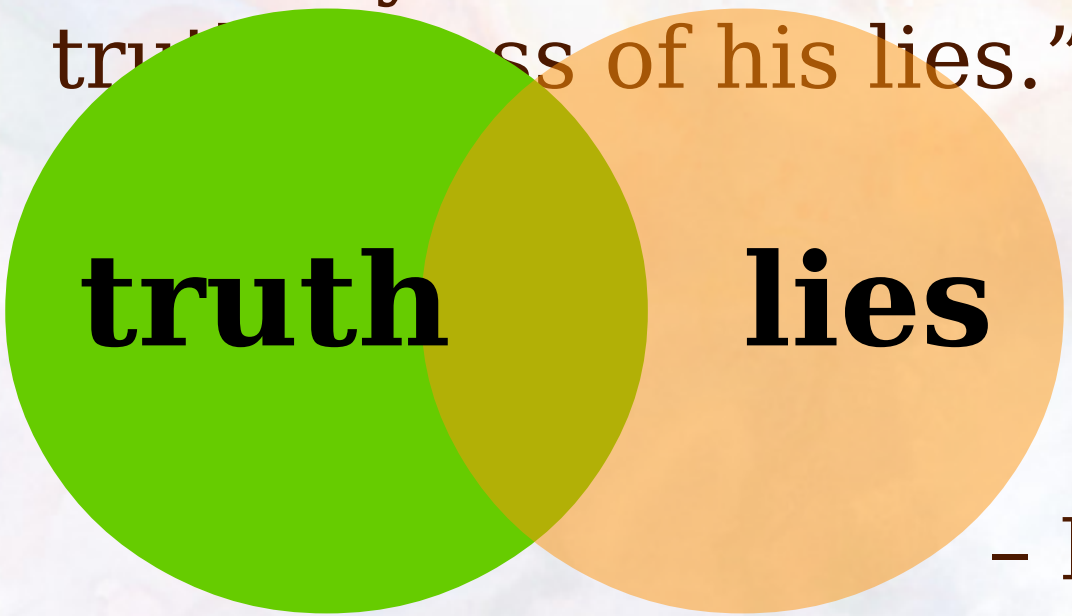
Secret Door

- Why a good book is a secret door
  Mac Barnett
  June 2014
  TED Talks
  http://www.ted.com/talks/mac_barnett_why_a_good_book_is_a_secret_door

Secret Door

- “We all know that Art is not truth. Art is a lie that makes us realize truth at least the truth that is given us to understand. The artist must know the manner whereby to convince others of the tru[illegible]ss of his lies.”

– Pablo Picasso

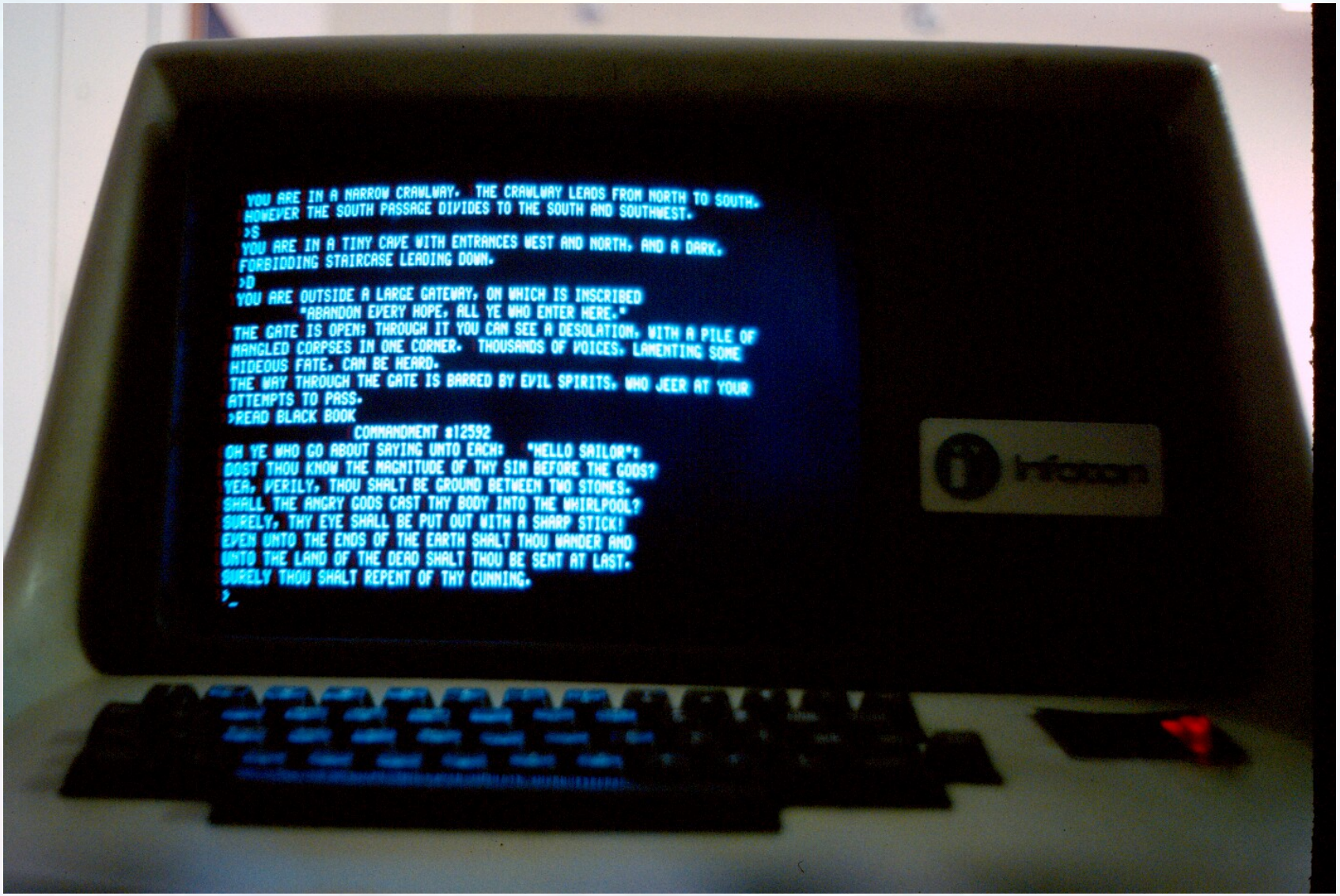


– Mac Barnett

Things happen in your mind
More with Less

PDP 10

Zork – PDP 10



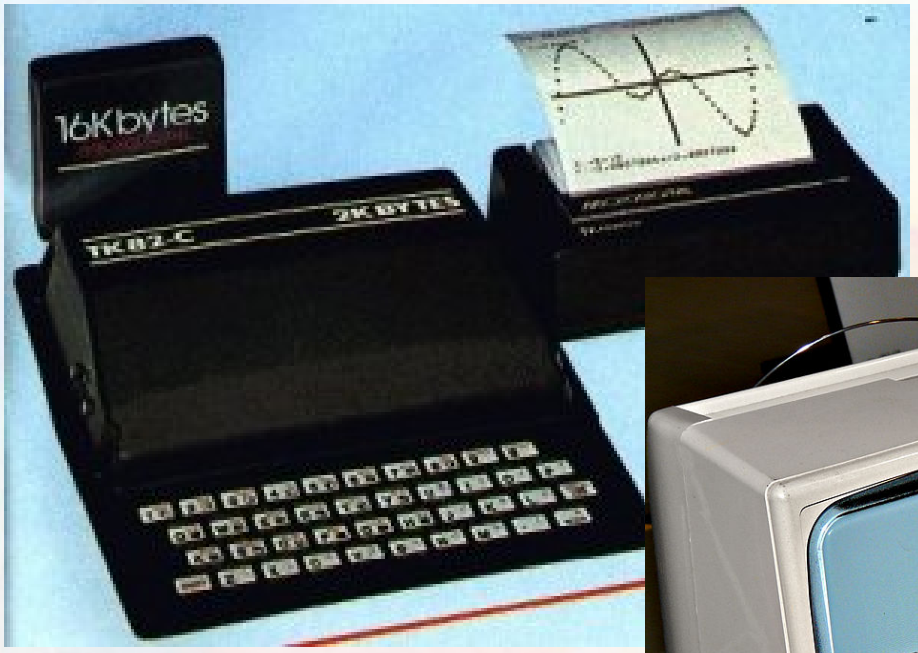
Picture by Tor Lillqvist [https://www.flickr.com/photos/tml/3704276671]

Zork – PDP 10

- “Robin Williams was said to be so addicted that he would call Marc Blank in the middle of the night, begging for hints”

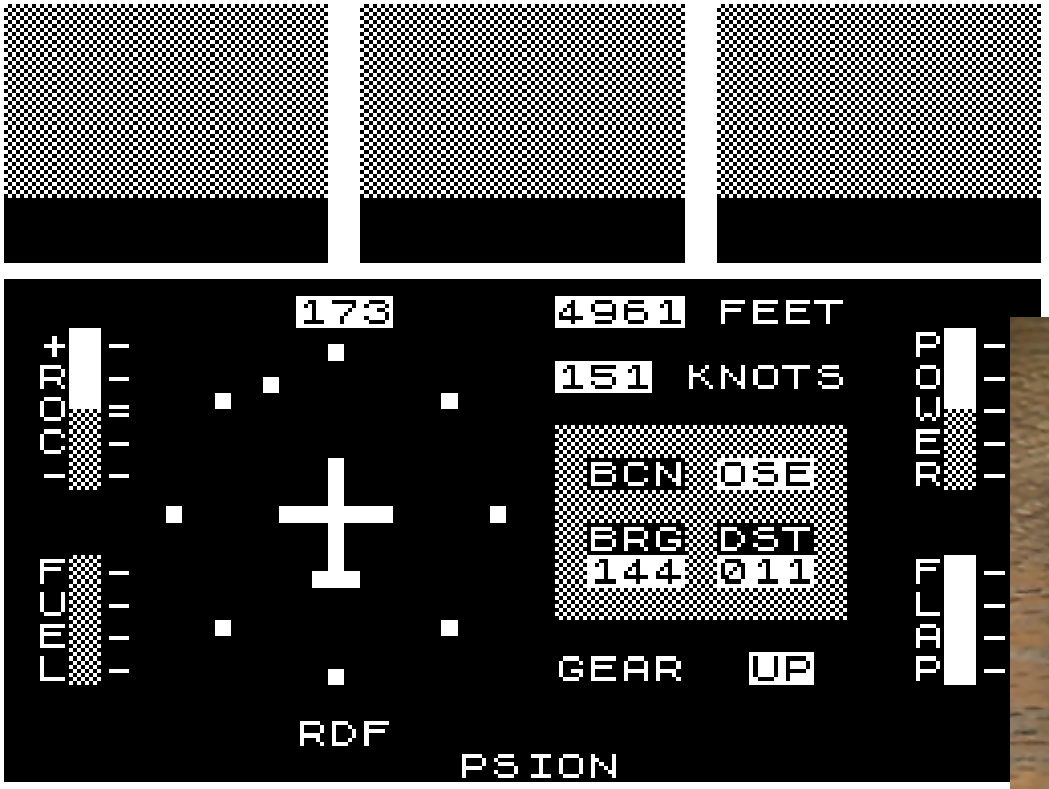
Down From the Top of Its Game - The Story of Infocom, Inc.
Hector Briceno, Wesley Chao, Andrew Glenn, Stanley Hu, Ashwin Krishnamurthy, Bruce Tsuchida
December 15, 2000

Things happen in your mind
More with Less



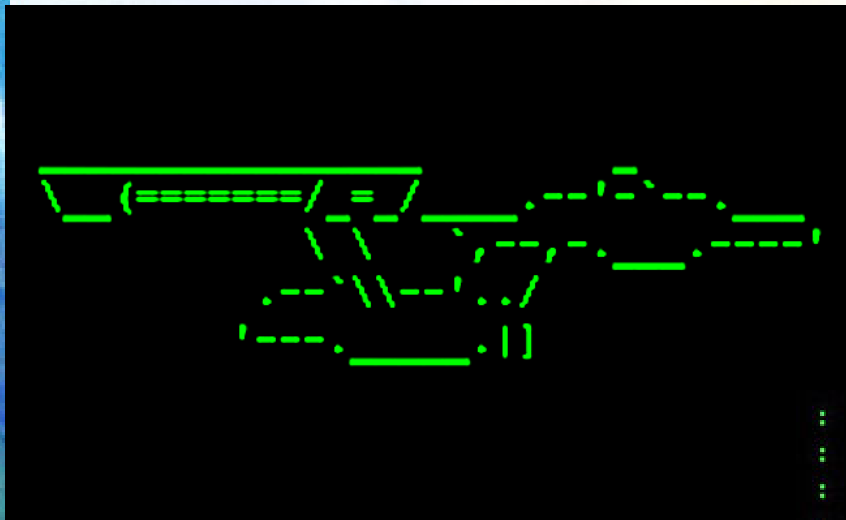
Sinclair_ZX81_Setup by Mike Cattell
[http://en.wikipedia.org/wiki/File:Sinclair_ZX81_Setup_PhotoManipped.jpg]

Flight Simulator - ZX-81



Youtube: https://www.youtube.com/watch?v=cvY4roVg7YQ

Star Trek




:205:5 :303:
:7 :5 :102:
:8 :6 :3 :
COMMAND?
QUADRANT 8-6
* *
*
* E * *
1 2 3 4 5 6 7 8
1 SECTOR 4-5
2 YEARS 3.0
3 STARDATE 3424.0
4 CONDITION GREEN
5 SHIELDS 50%
6 SHIELD ENERGY 2500
7 AVAIL ENERGY 2500
8 PH TORPS 10
KLINGONS 33
BASES 3
COURSE NOT SET.

Dancing Demon

https://www.youtube.com/watch?v=FQizYzw27FY

Tetris

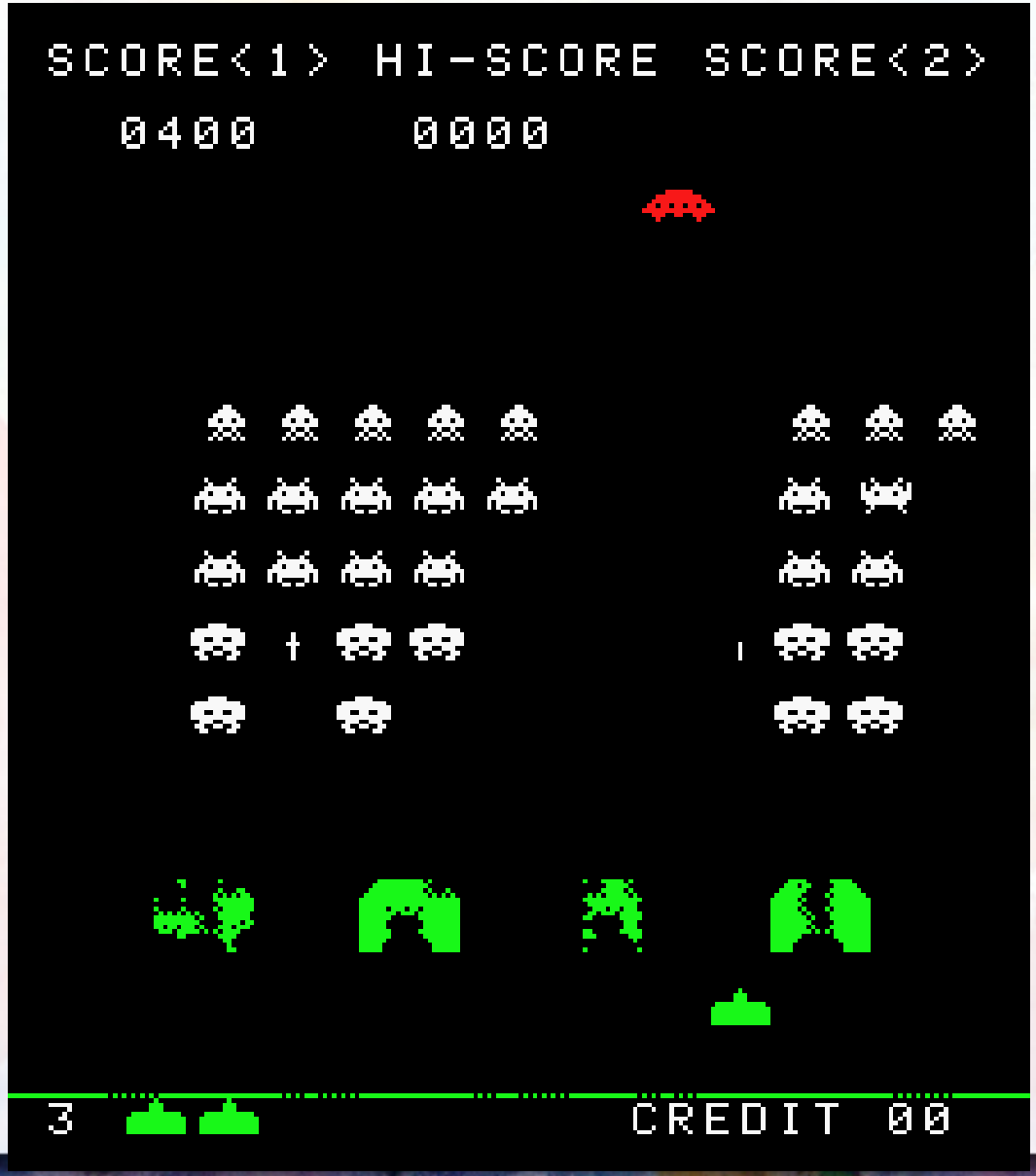

Your level: 0
Full lines: 1
SCORE 60
H E L P
7:Left
9:Right
8:Rotate
1:Draw next
6:Speed up
4:Drop
SPACE:Drop
Next:
STATISTICS
1
0
1
1
0
2
1
Σ : 6
Play TETRIS !

Every game is a Problem Solving

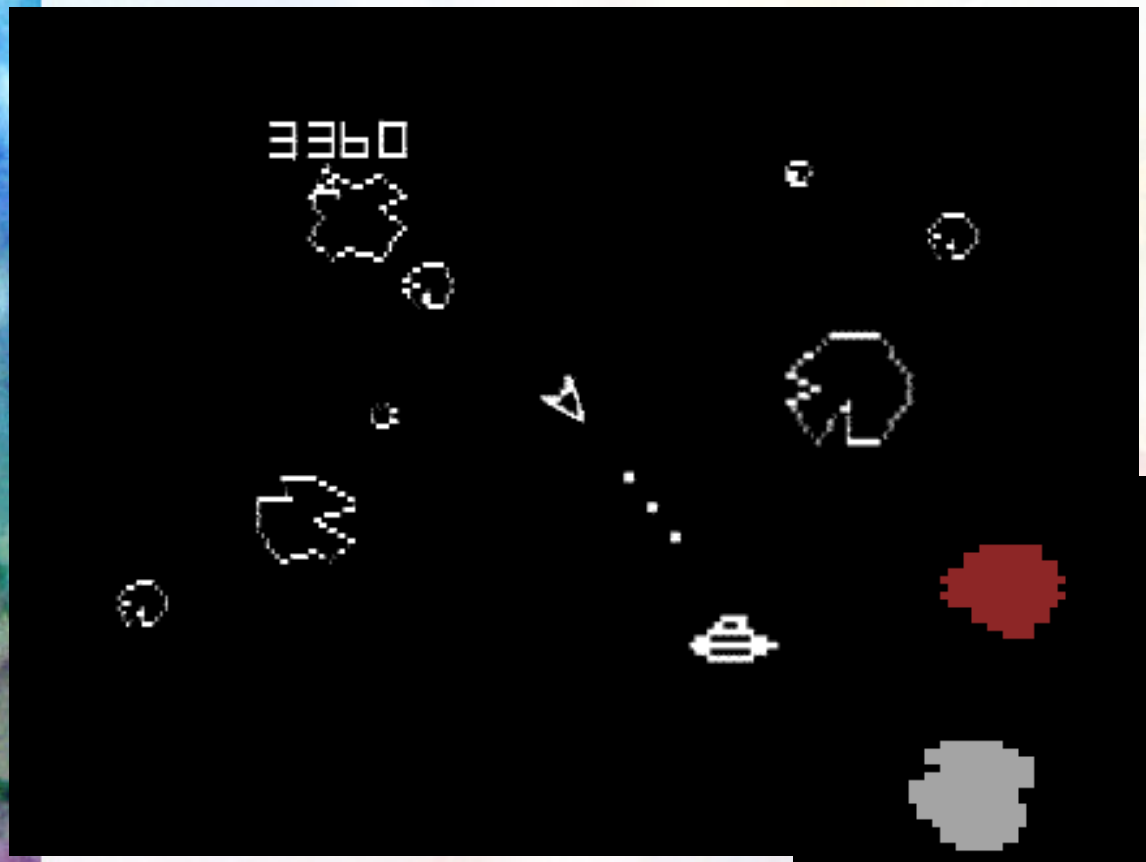
But, which kind of problem?

Mostly Action Games

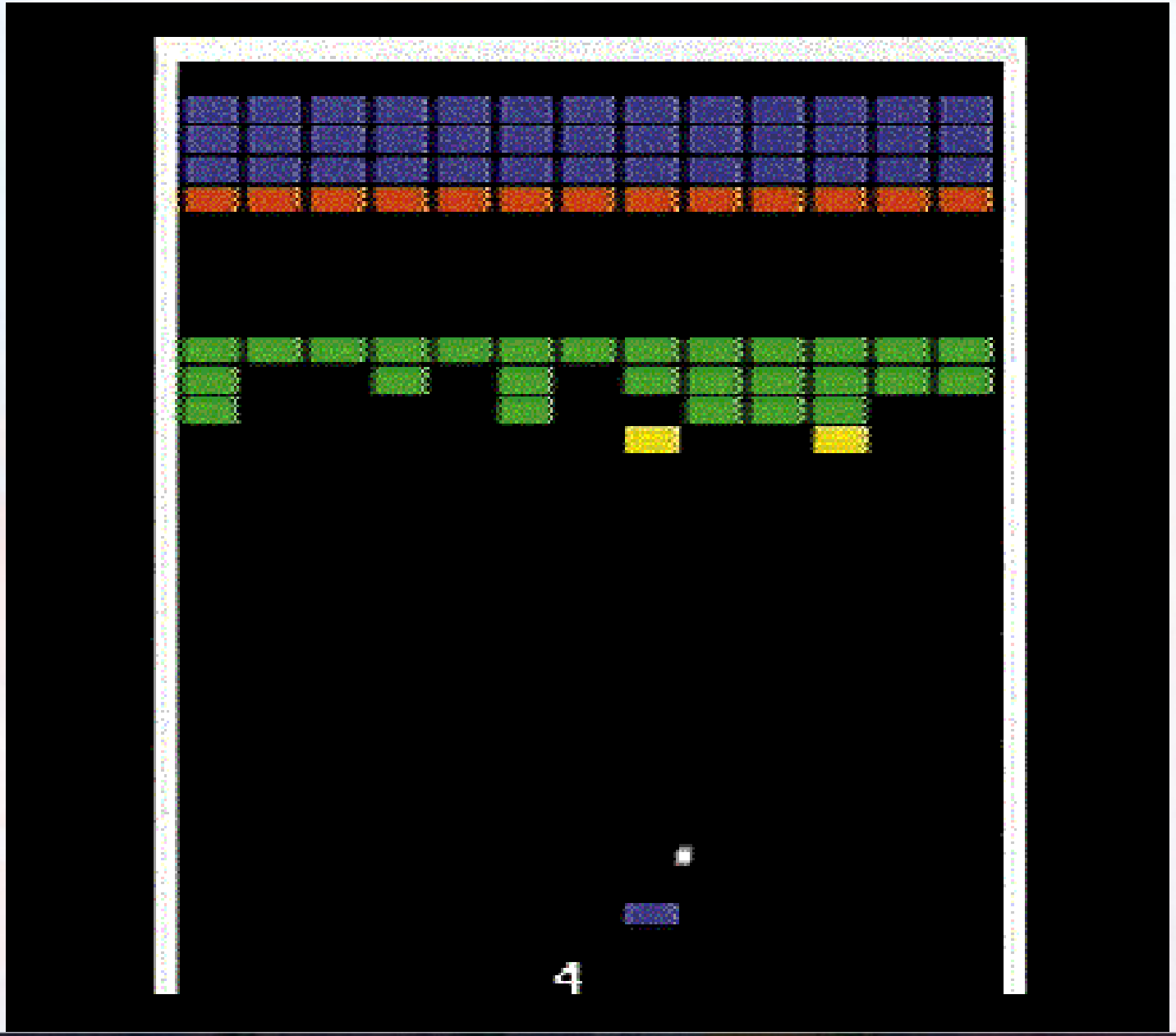
Space Invaders



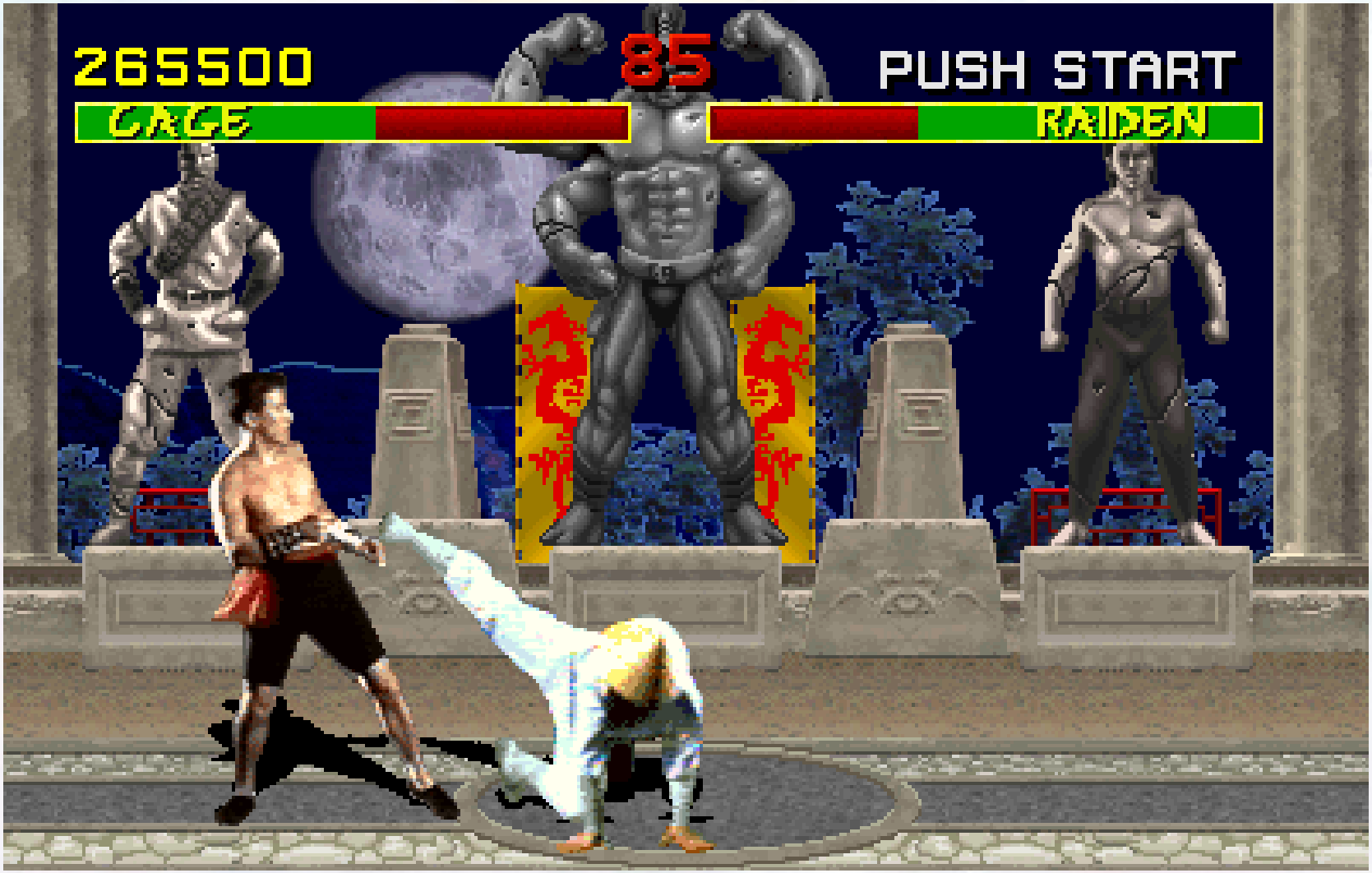
Asteroids



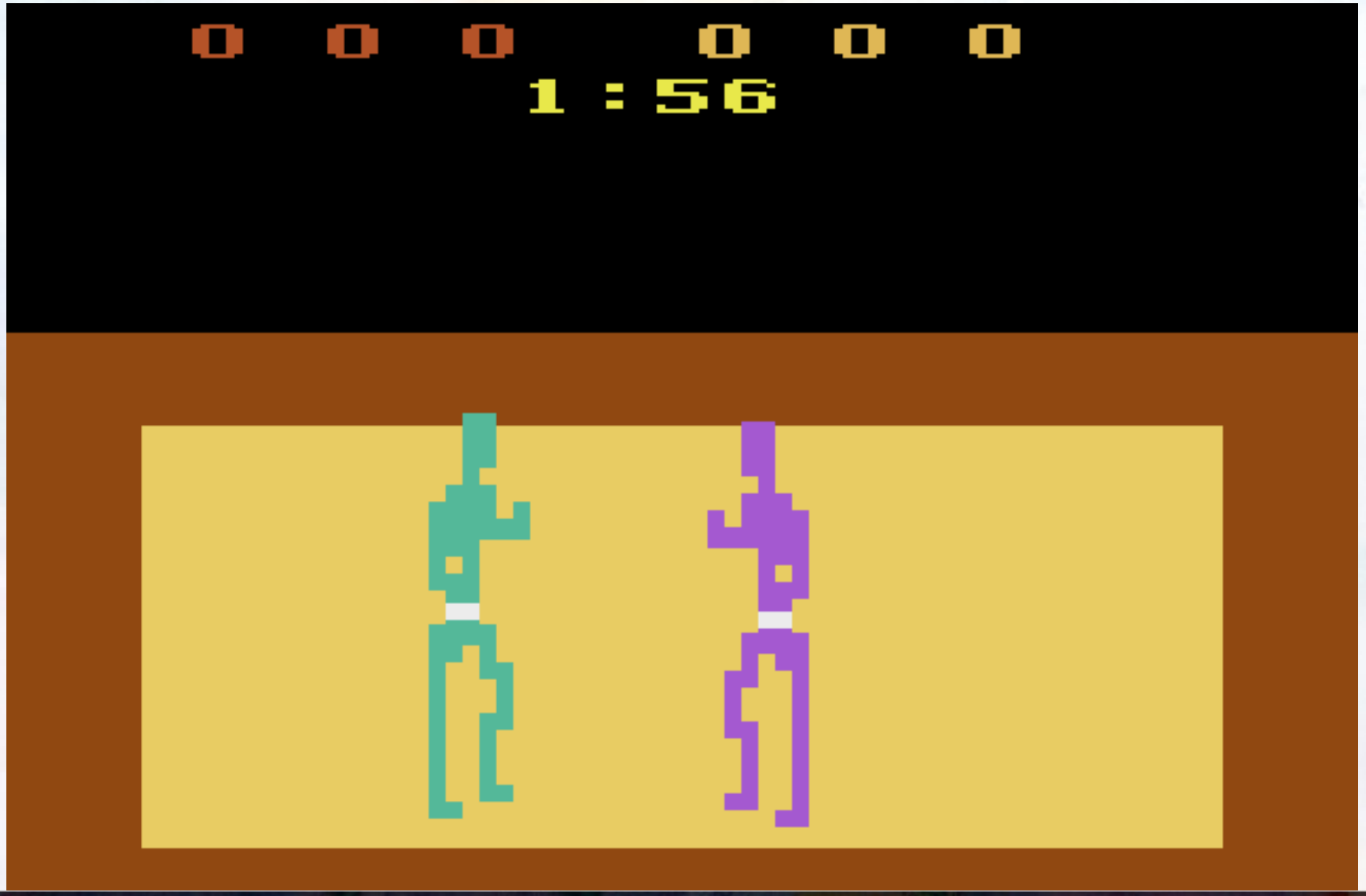
Paredão / Break Out



Mortal Combat



Karate

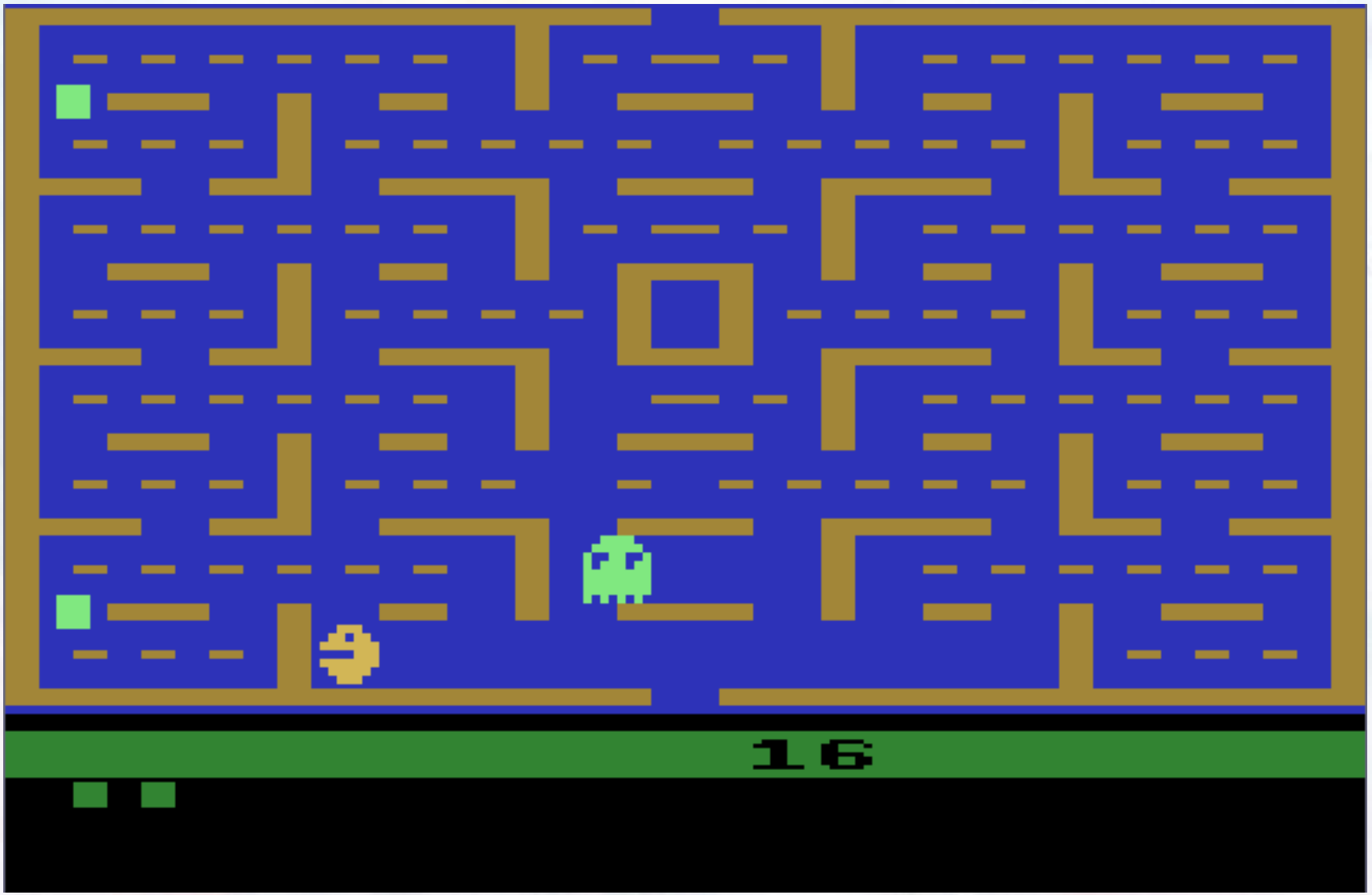


Pimball

Jogos de Corrida / Enduro

Keystone Kapers

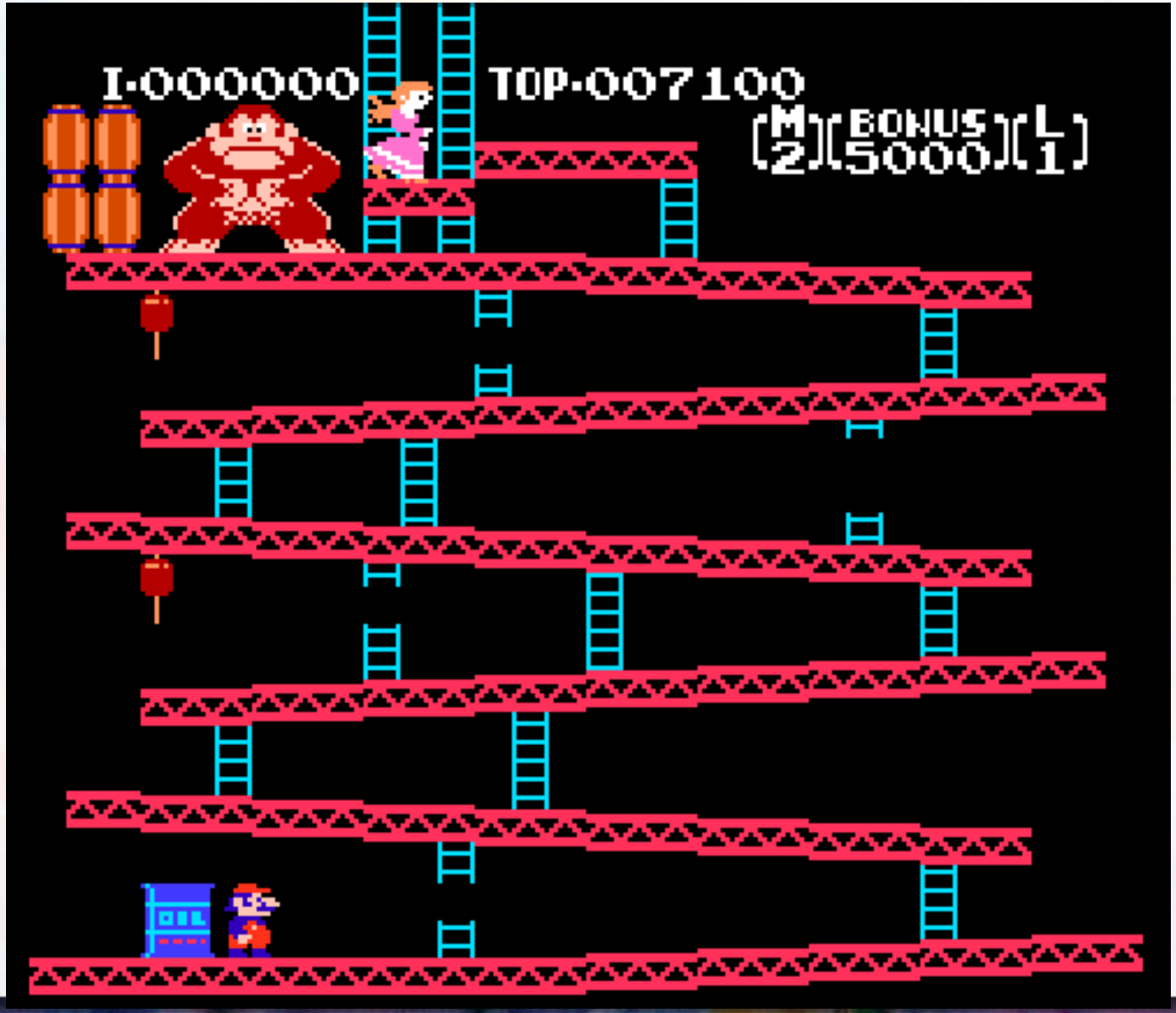
Pac-man



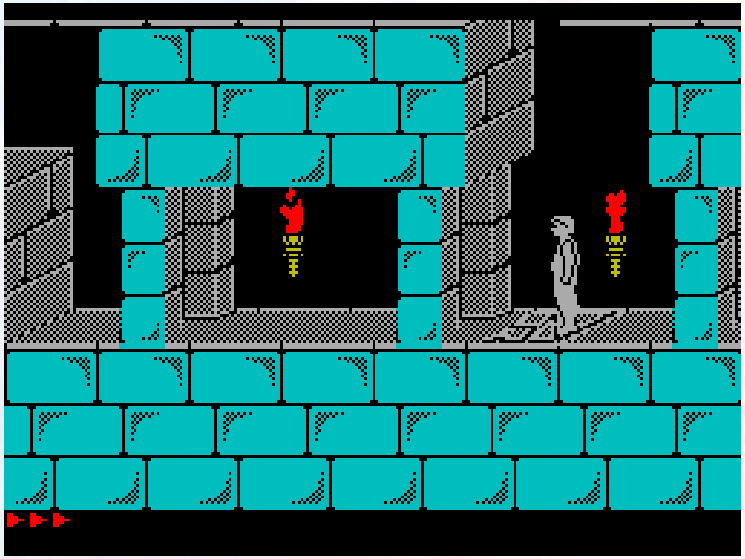
Pitfall!

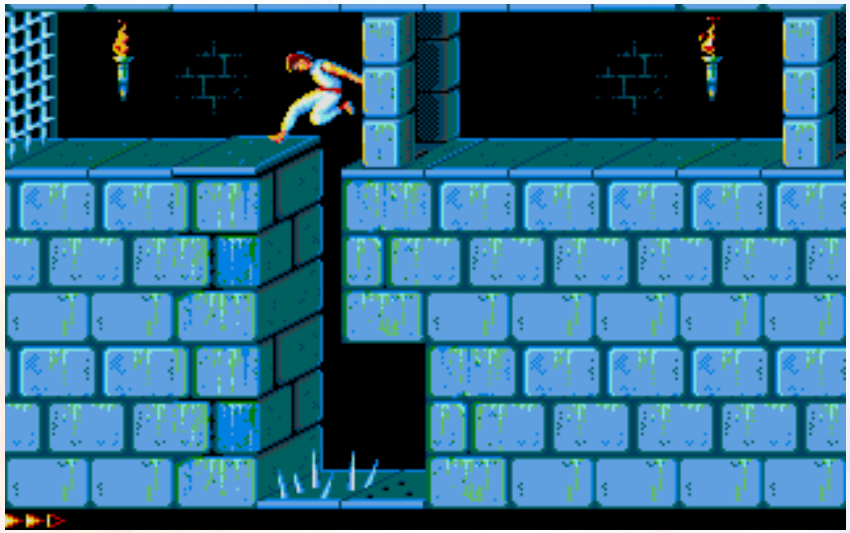
River Raid

Donkey Kong



Príncipe da Pérsia

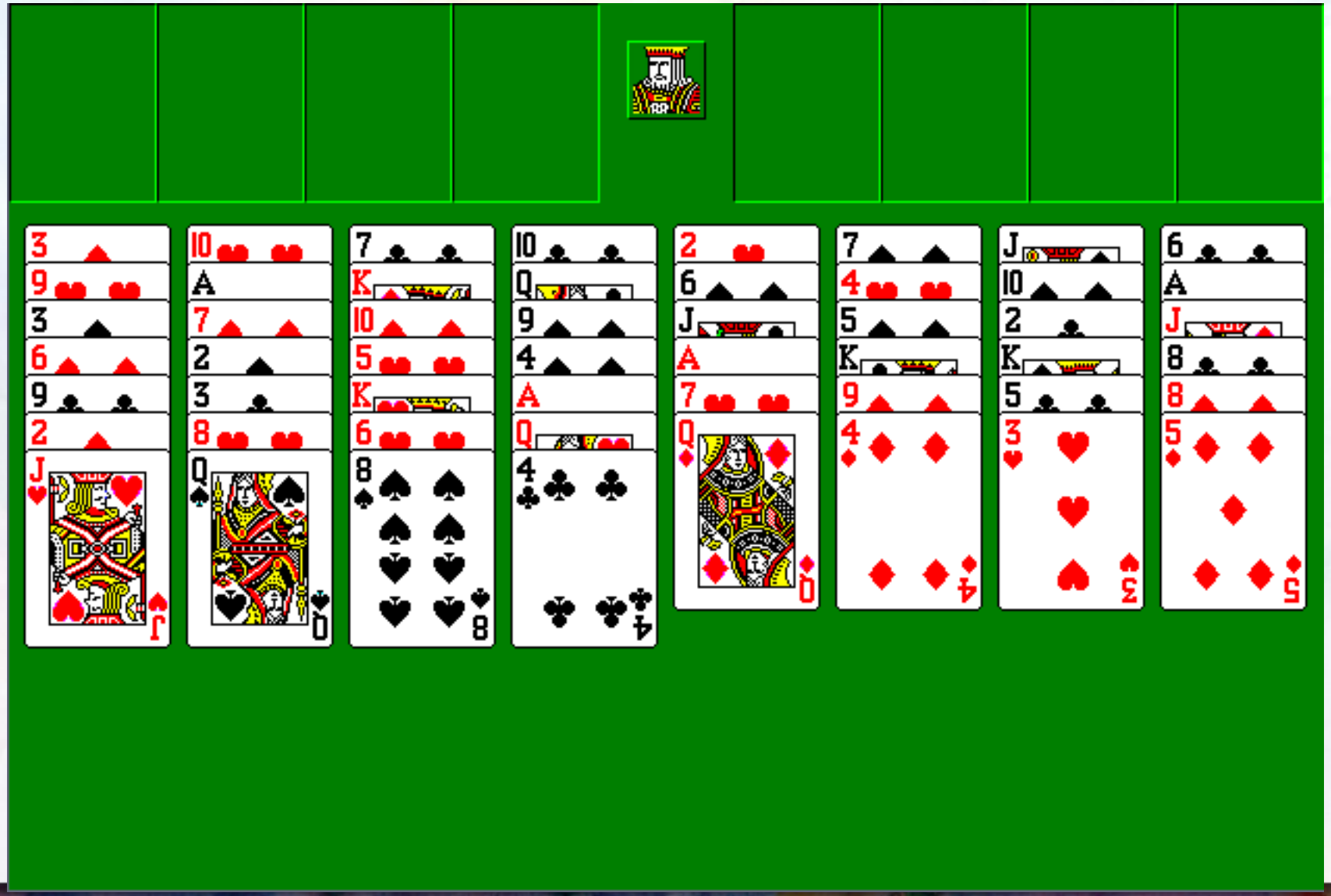




Wolfenstein 3D / DOOM / Quake

Simple Logic Games

Card Games



Tetris


Your level: 0
Full lines: 1
SCORE 60
H E L P
7:Left
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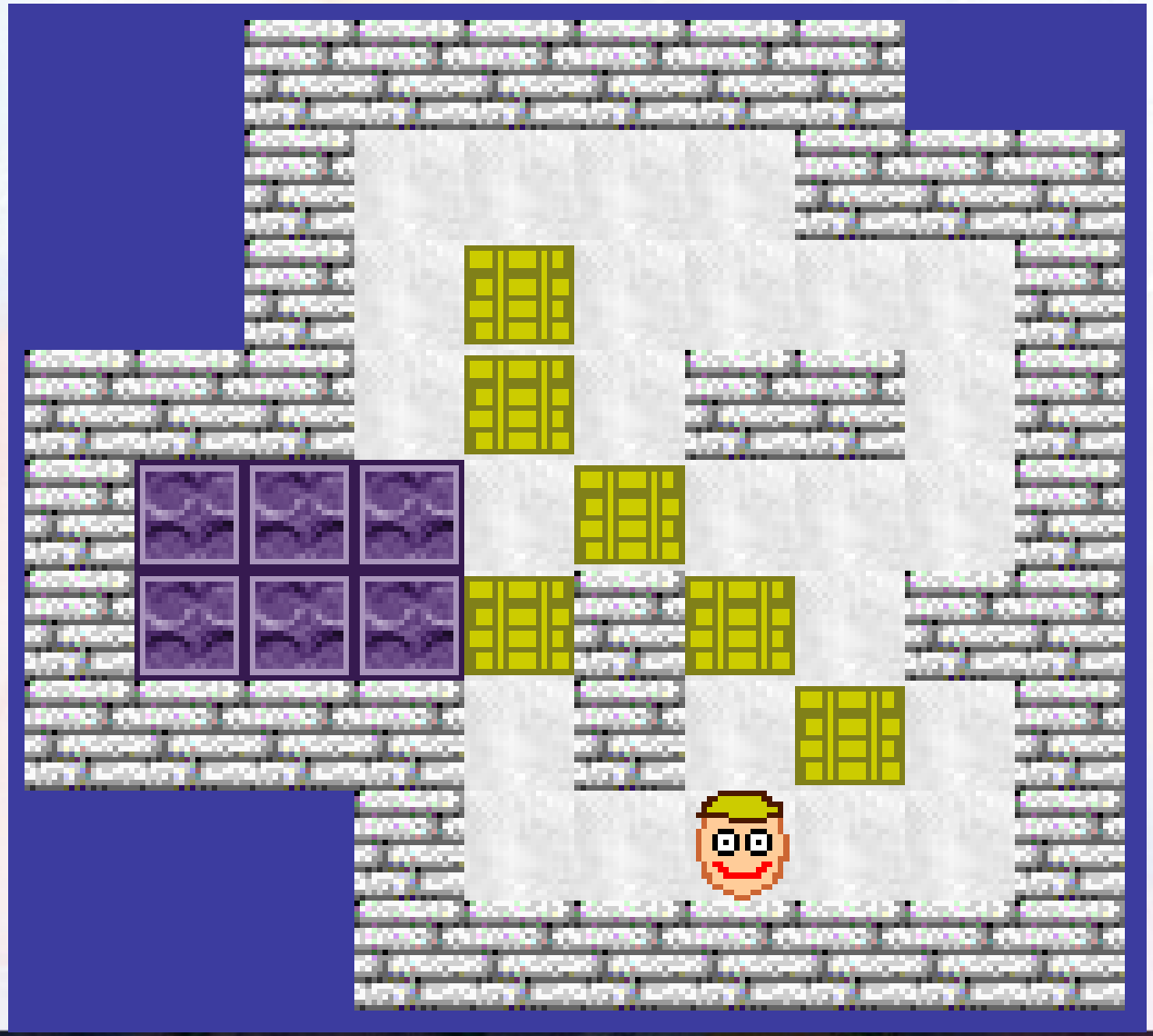
8:Rotate
1:Draw next
6:Speed up
4:Drop
SPACE:Drop
Next:
STATISTICS
1
0
1
1
0
2
1
Σ : 6
Play TETRIS !

Puzzle Games

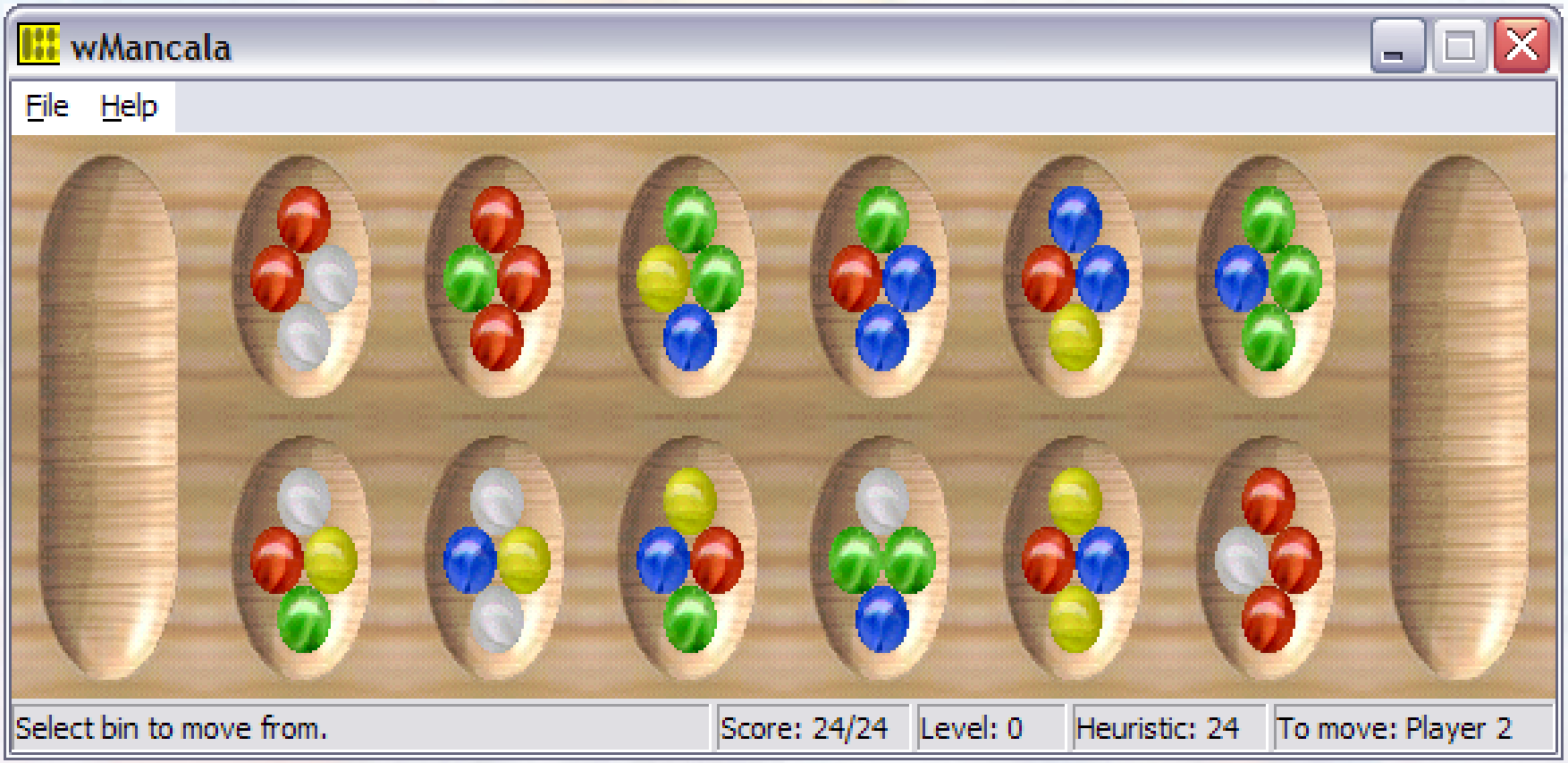
Rush Hour


EXIT
Level 1 Beginner
Rush Hour
www.G5.dk
Help the red beetle to EXIT.
About

Sokoban

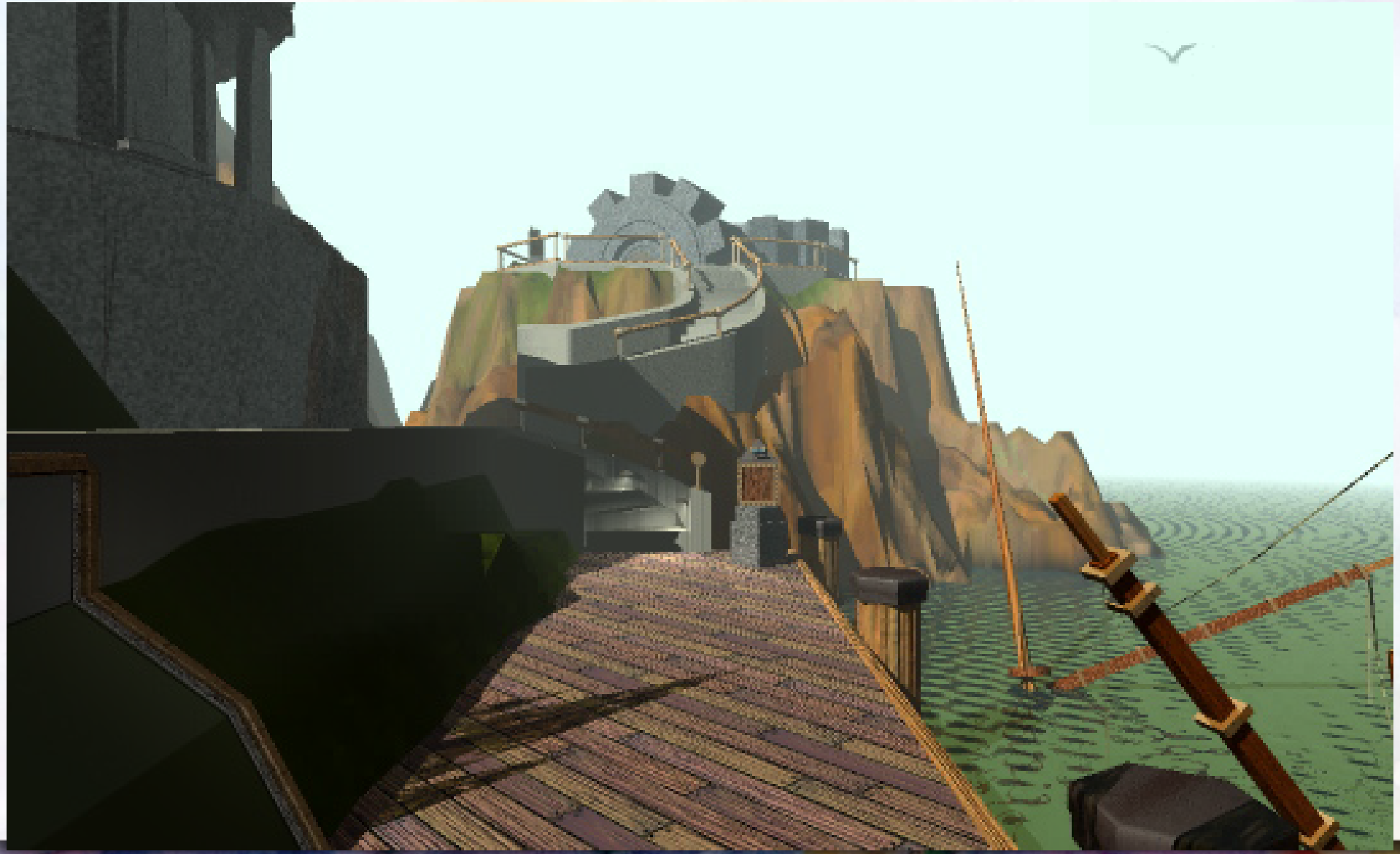


Mancala / Kalaha



Adventure Games

Myst



Out of Order

Carmen Sandiego

Decision Making and Business Games

Limonade

Limonade

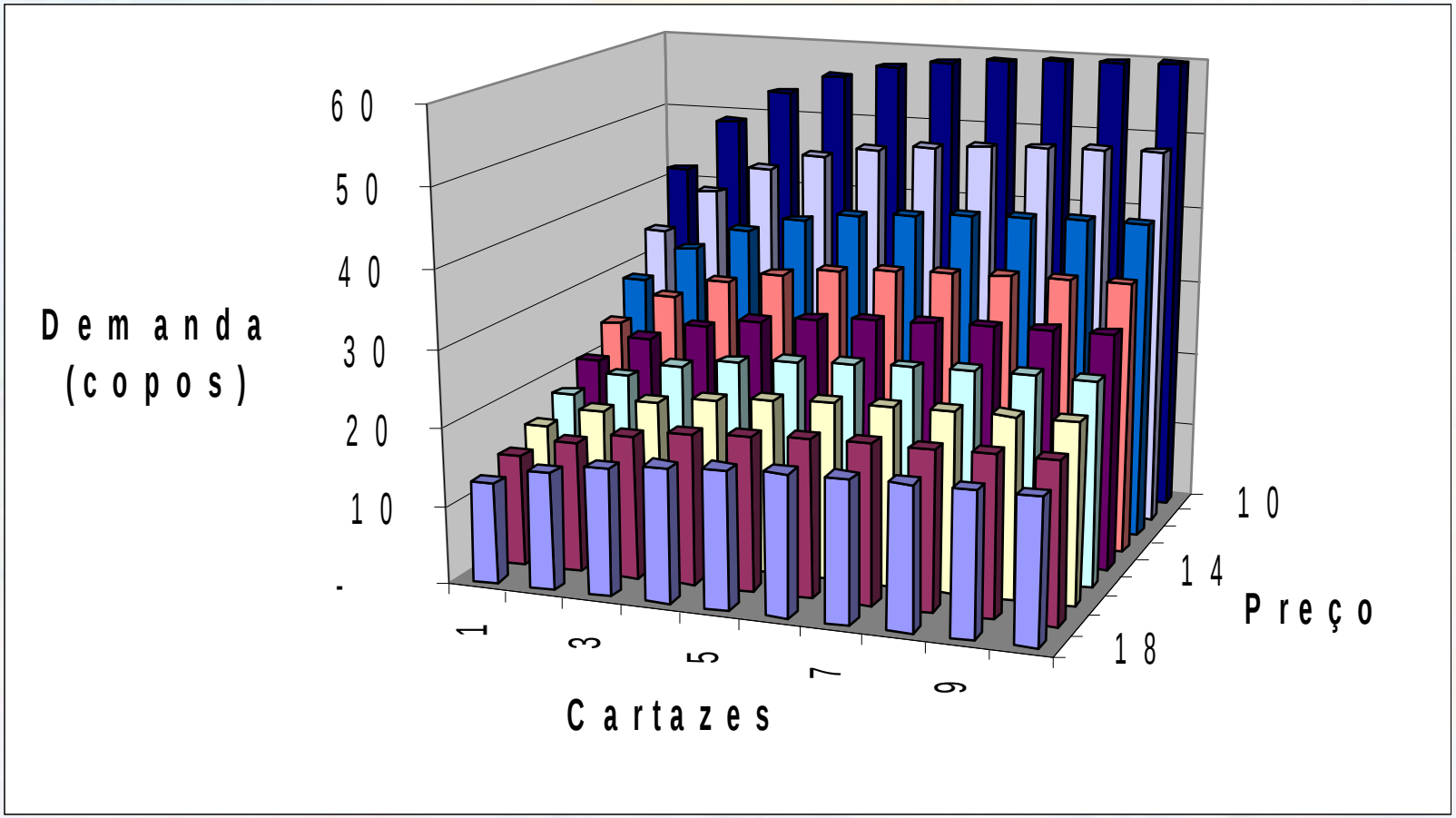

LEMONSVILLE WEATHER REPORT
SUNNY


LEMONSVILLE WEATHER REPORT
CLOUDY


LEMONSVILLE WEATHER REPORT
THUNDERSTORMS!

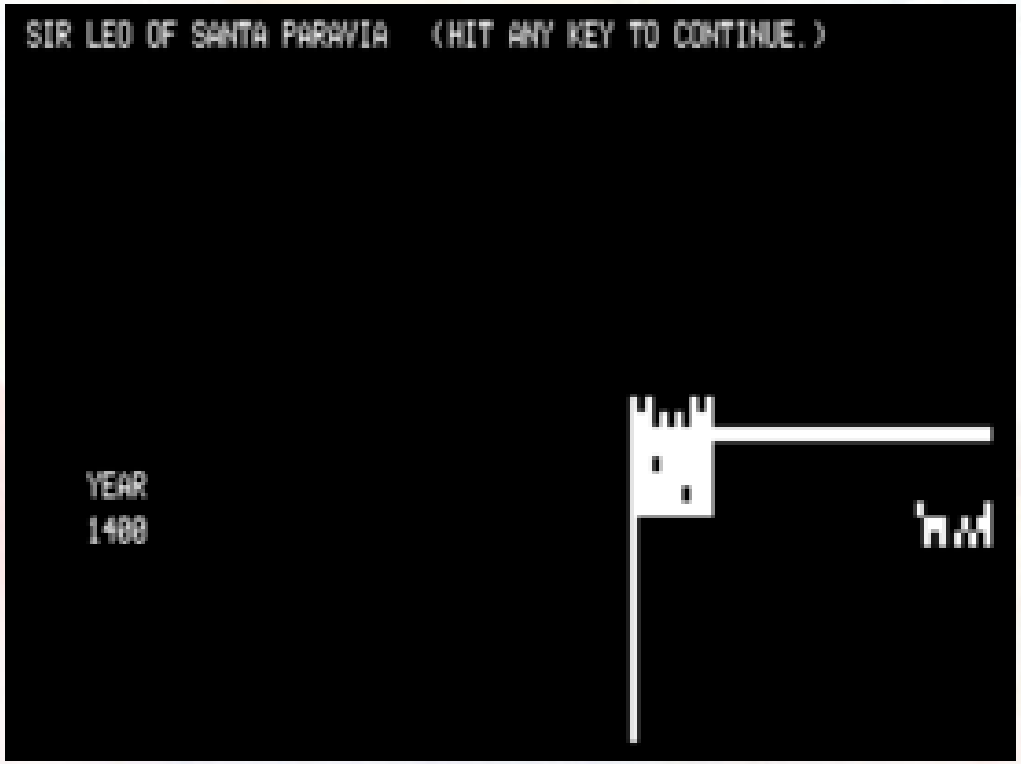

LEMONSVILLE WEATHER REPORT
HOT AND DRY

Model behind Lemonade



(Simone Santanchè, 2002)

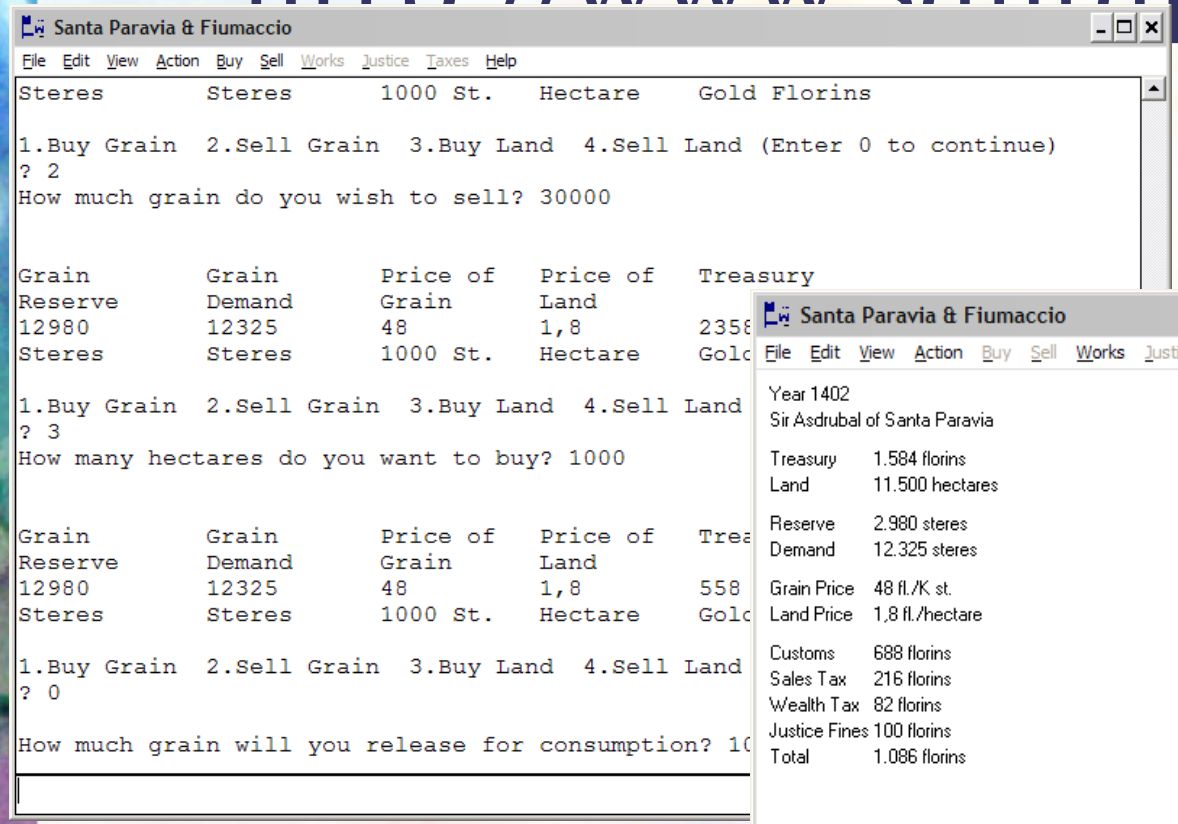
Santa Paravia

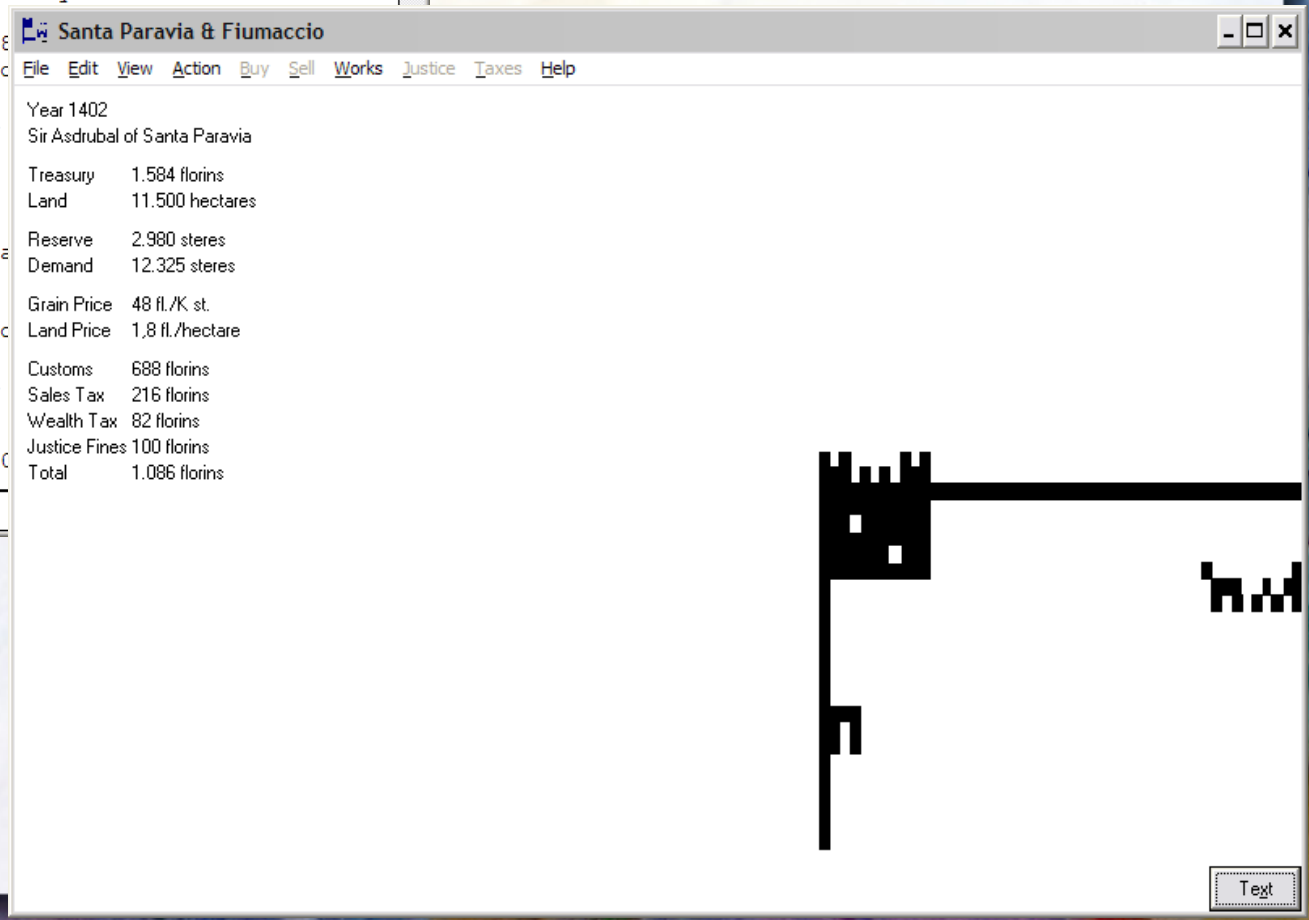


Santa Paravia

```
                SIR FIUMIUS OF FIUMACCIO

RATS ATE 12% OF YOUR GRAIN RESERVES!

GOOD WEATHER                    FINE HARVEST
                              (15277 STERES)

GRAIN RESERVE (STERES) :              17460
GRAIN DEMAND  (STERES) :               5880
GRAIN PRICE  (1000 ST) :              42.68
LAND PRICE    (HECTARE) :                2.3
LAND OWNED    (HECTARE) :               5350
LAND PERMIT  (7500+HA) :                 NO
TREASURY      (FLORINS) :               1195
YOU MUST RELEASE BETWEEN 20% AND 80% OF
YOUR RESERVES.

PLEASE TYPE : "Z" FOR THE MINIMUM
              "X" FOR THE MAXIMUM
              "D" FOR THE DEMAND
               OR A NUMBER BETWEEN
                  3493 AND 13969
YOUR CHOICE :
```

Santa Paravia online - http://www.santaparavia.com





Mercante

http://www.ic.unicamp.br/~santanche/teaching/alg/alg-mercante.html

Why someone develops Games?

Picture by Dan and Fern Treacy [https://www.flickr.com/photos/treacy/2666434799]

Faith:
Make
people
Happy \o/

When games don't help?

Two Sides of the Question
Waste of Time

Condor - Madrigal

When games help?

Global Game Jam 2014

Global Game Jam 2014

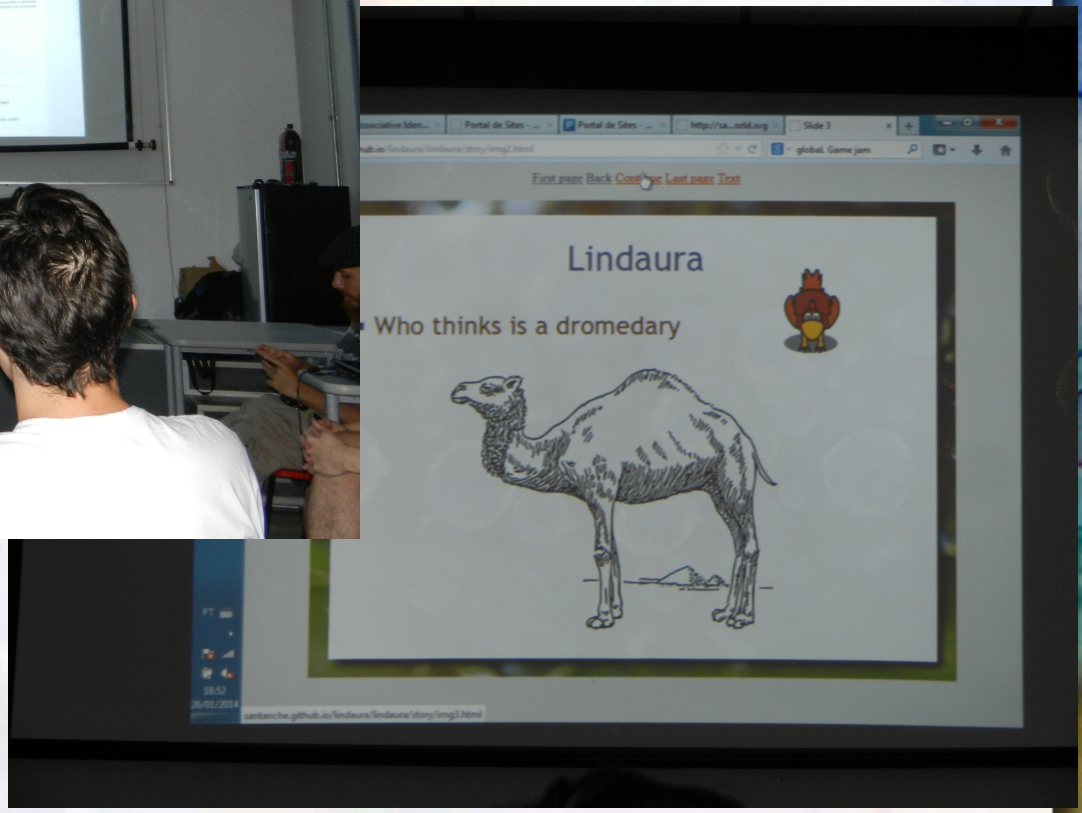
Global Game Jam 2014

Global Game Jam 2014

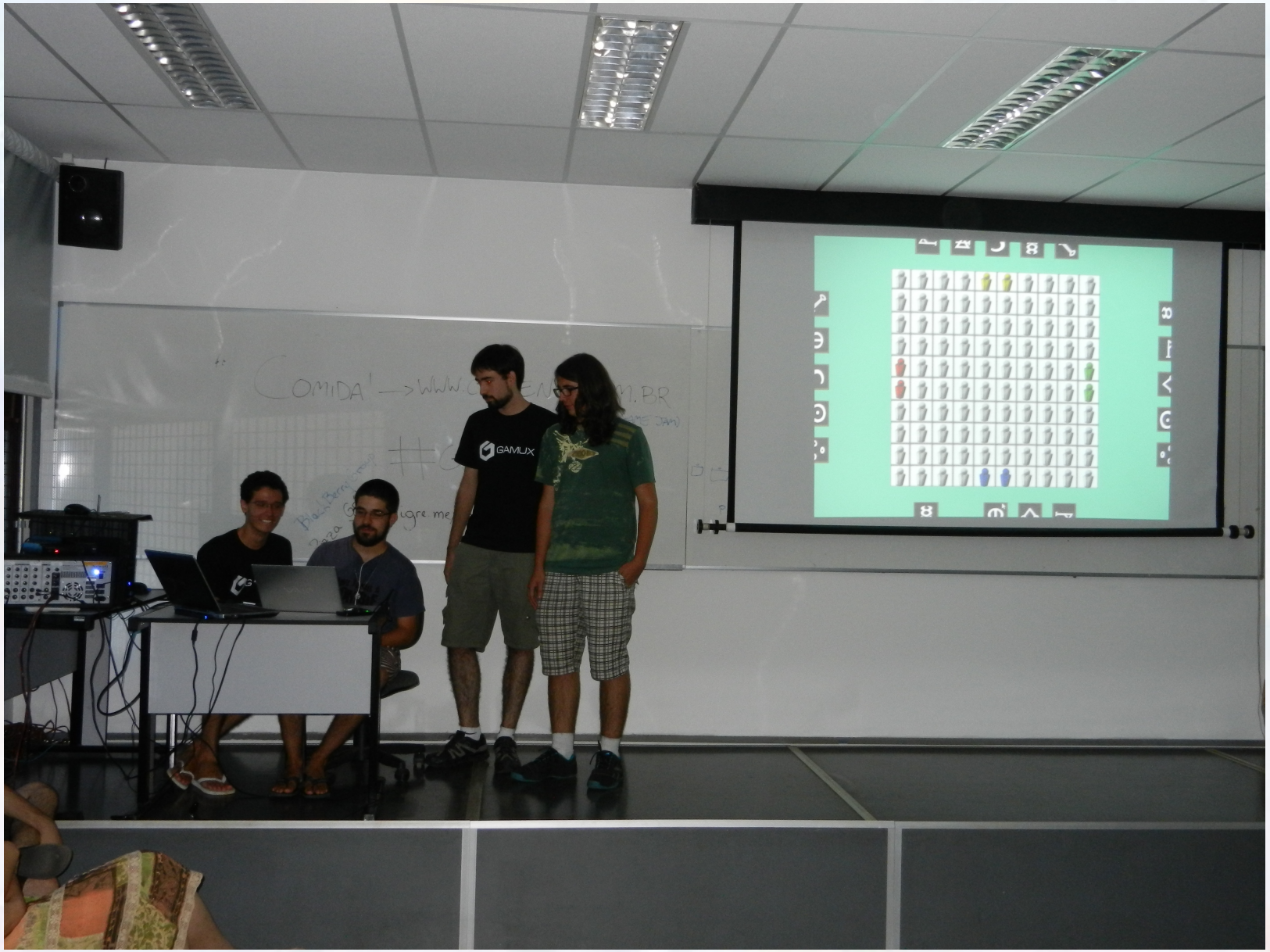
Global Game Jam 2014

Global Game Jam 2014

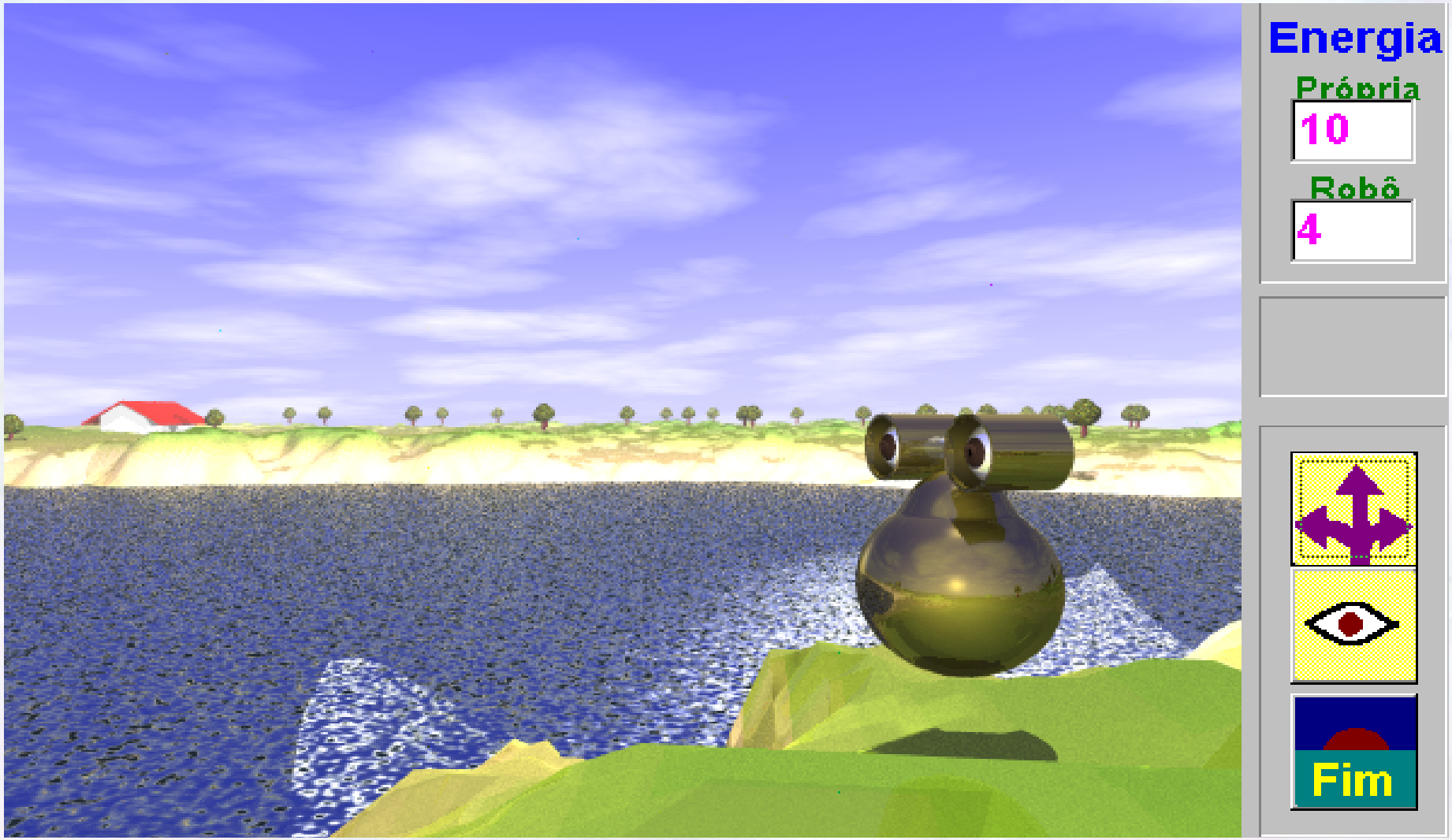
Global Game Jam 2014



Global Game Jam 2014



Work Together
Amigoles



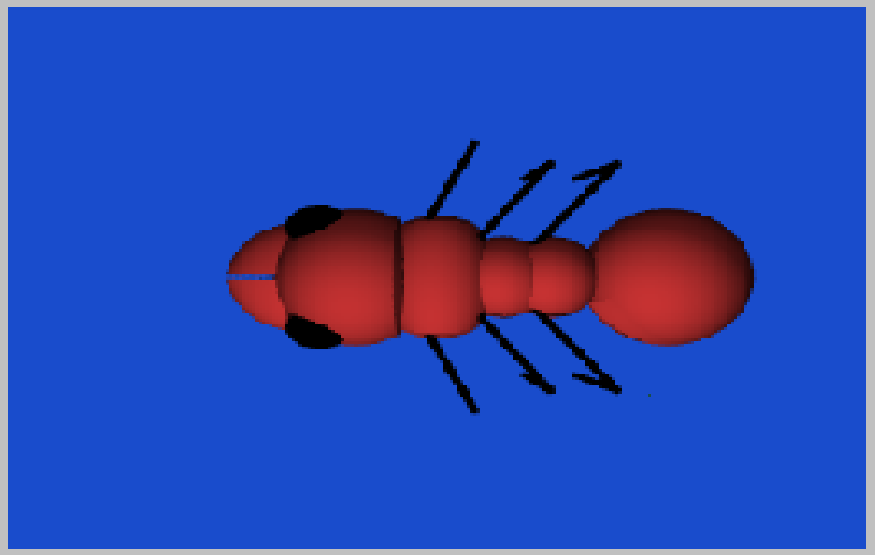
Para onde você quer ir?

- Margem inferior do lago
- Trilha em direção ao campo - parte 2
- Lado direito do lago

Mapa

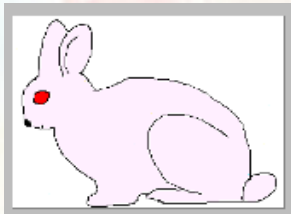
Você encontrou aqui:

Formiga



Pergunta: Você viu por aí alguém com um mapa?

A formiga disse:
Tenho trabalhado muito, mas consegui ver alguém com um pedaço do mapa,
o seu predador é o falcão.



Nome: Coelho

Classe: mamífero

Habitat: o campo

Número de patas: 4

Predador: Cobra

- ○ Anda
- ○ Arrasta
- ◉ Pula
- ○ Nada
- ○ Voa

- ◉ Herbívoro
- ○ Carnívoro
- ○ Onívoro

Banca do Quincas

http://logames.sourceforge.net/

Projeto Jogos & Objetos de Aprendizagem

SOURCEFORGE.NET®

Lançamento - Jogo Banca do Quincas

Este é um jogo de simulação onde você deve administrar uma banca que vende produtos. Seu objetivo no jogo é tentar obter a maior renda possível com a venda de seus produtos. Para isso você terá que usar seus conhecimentos de matemática, mais um pouco de intuição.

O desafio é conseguir avaliar a quantidade certa de produtos a ser fabricada para a venda, como também um preço que atraia seus clientes. Preste atenção na variação do tempo, porque ela afeta os seus negócios.

- Jogue on-line
- Faça o download do Jogo
- Licença de uso e créditos
- Equipe e contato

Este jogo é também um objeto de aprendizagem e foi um dos vencedores do Concurso RIVED 2008. Ele faz parte de um projeto de pesquisa mais amplo que envolve a construção de jogos dentro de objetos de aprendizagem. Leia o nosso artigo publicado no Simpósio Brasileiro de Informática na Educação e participe do nosso projeto open-source.

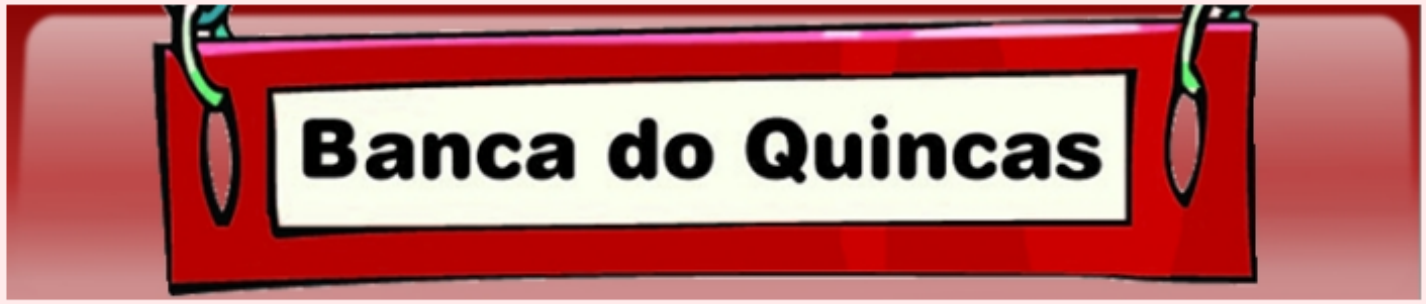
Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

file:///C:/Andre/pesquisa/temas/banca-quincas/B

Google

Geladinho



Instruções Configurar Jogar

Concluído

Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

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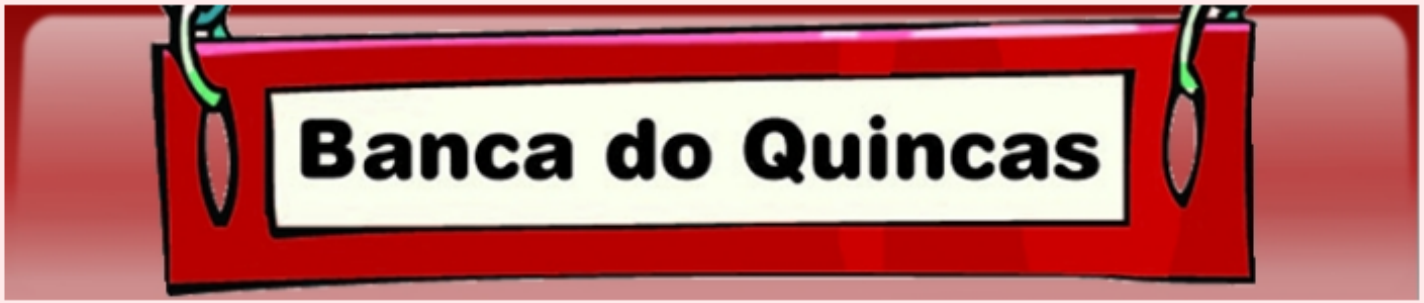
Geladinho



	A	B	C	D	E	
1	SALDO DINHEIRO INICIAL	10			CLIMA	PROI
2					ENSOLARADO	
3	SALDO DINHEIRO ATUAL	10			NUBLADO	
4					CHUVOSO	
5	PRODUTO VENDER	GELADINHO				
6						
7	MATERIA PRIMA	VALOR UNIT.	QUANT. MISTURA			
8	LIMÃO;LIMÕES;(uni)	0.2	1			
9	COLHER DE AÇUCAR;COLHERES D...	0.1	2		DETERMINAÇÃ...	
10	COPO DE ÁGUA;COPOS DE ÁGUA;(uni)	0.1	1			
11	SAQUINHO;SAQUINHOS;(uni)	0.2	1		PESSOAS PRO...	
12						
13	PREÇO MÁXIMO	2			UNIDADES PER...	
14						
15	QUANTIDADE MÁXIMA PESSOAS	20				
16						
17	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxxxx			
18					PROBABILIDAD...	PROI
19	OPERAÇÃO				SAZONALIDADE	

Instruções Configurar Jogar

Concluído

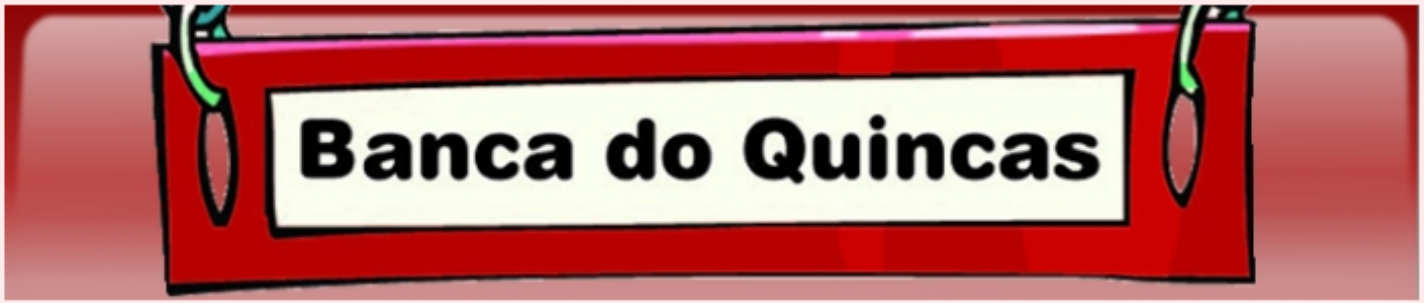
Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

file:///C:/Andre/pesquisa/temas/banca-quincas/B

Google

Geladinho



TEMPO CORRENTE

Hoje o tempo está quente e ensolarado.

Continuar Ajuda

Concluído

Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

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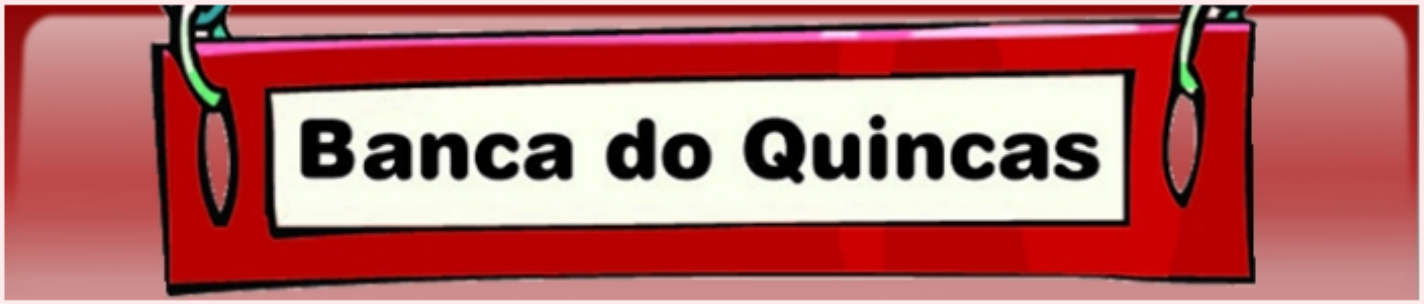
Geladinho



COMPRA DE INGREDIENTES

Saldo | Receita | Estoque

LIMÃO (uni): 0
COLHER DE AÇUCAR (gr): 0
COPO DE ÁGUA (uni): 0
SAQUINHO (uni): 0

Itens	Preço	Quantidade a Comprar	Custo
LIMÃO (uni)	0.2	5	1.00
COLHER DE AÇUCAR (gr)	0.1	10	1.00
COPO DE ÁGUA (uni)	0.1	5	0.50
SAQUINHO (uni)	0.2	5	1.00
Total:			3.50

Calcular Comprar Ajuda

Concluído

Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

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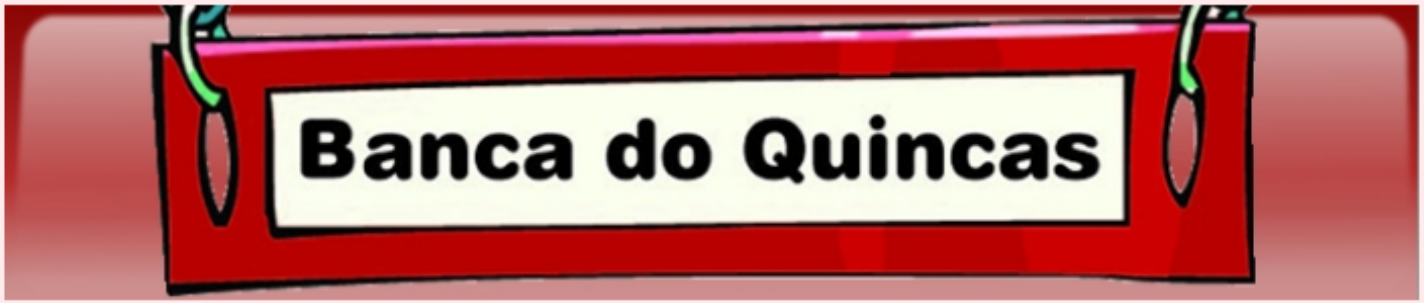
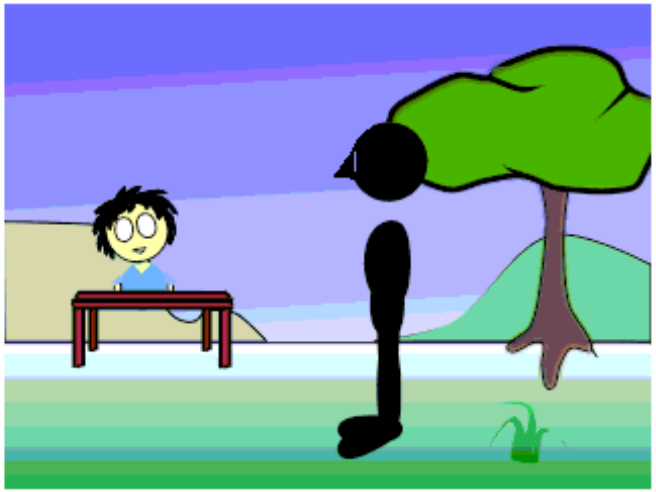


VENDENDO



Continuar Ajuda

Concluído

Banca do Quincas - Mozilla Firefox

Arquivo Editar Exibir Histórico Delicious Favoritos Ferramentas Ajuda

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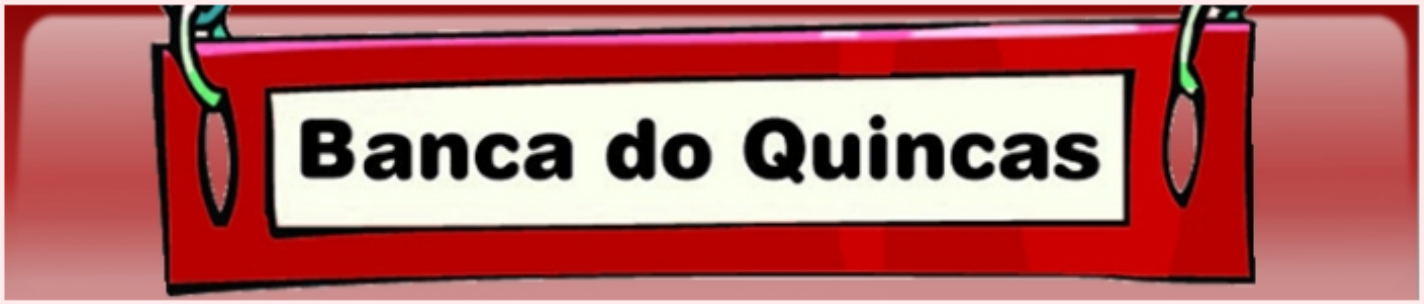


RESULTADO DA RODADA DE NÚMERO: 1

Você concluiu mais um dia de vendas.
Verifique abaixo os resultados obtidos e informações úteis sobre seu desempenho nesta rodada.

Estoque Atual		Resultado das Vendas	
LIMÃO (uni)	0	Pessoas procuraram:	10
COLHER DE AÇUCAR (gr)	0	Unidades vendidas:	5
COPO DE ÁGUA (uni)	0	Rendimento:	R$ 10.00
SAQUINHO (uni)	0	Saldo Financeiro:	R$ 16.50

Perdas

Unidades perdidas: 0

Continuar Ajuda

Concluído

Extremes and Flight Simulator

Build and Play

Can Play Games and Build Games be part of the same process?

What are the boundaries?

Faith

Games make people **Happy \o/**

and make people **Grow** *

Things I am looking for

- Creative thinking
- Tools for thinking
- Active engaging games

Games in Education

Why do we need to reproduce classes?

Problem-based Learning

- “uma estratégia instrucional em que estudantes se confrontam com problemas contextualizados e pouco estruturados e empenham-se em encontrar soluções significativas.” (Rhem, 1998)

Meta-Modelo
Abordagens

- Diferentes abordagens derivam de um meta-modelo comum:
  - Problem Based Learning (PBL)
  - Project Based Learning
  - Case Based Learning (CBL)
  - WebQuest

Dissociation of Game Purpose and Learning Purpose

- Practical Experience:
  - Info2000 – Uma Aventura Espacial

Piaget

- Developmental psychologist
- Kids as active thinkers
  - Little scientists

Papert

- "A criança deve programar o computador, não o inverso."

  – Seymour Papert

- "E ao ensinar o computador a ‘pensar’, a criança embarca numa exploração sobre a maneira como ela própria pensa. Pensar sobre modos de pensar faz a criança tornar-se um epistemólogo, uma experiência que poucos adultos tiveram."

  – Seymour Papert

Papert e Computational Thinking

- "O computador não é usado somente como instrumento, mas essencialmente de maneira conceitual."

  – Seymour Papert

Papert and LOGO

- Online LOGO
  - http://www.calormen.com/jslogo/

Computational Thinking

- “It represents a universally applicable attitude and skill set everyone, not just computer scientists, would be eager to learn and use.”
- “Thinking like a computer scientist means more than being able to program a computer. It requires thinking at multiple levels of abstraction.”

(Wing, 2006)

Tools for Thinking

I feel like a caveman who had a dream of drawing in a paper with a pencil.

Picture by kasiQ kmjw [https://www.flickr.com/photos/38464962@N02/6580525445]

Components

We compose more than software

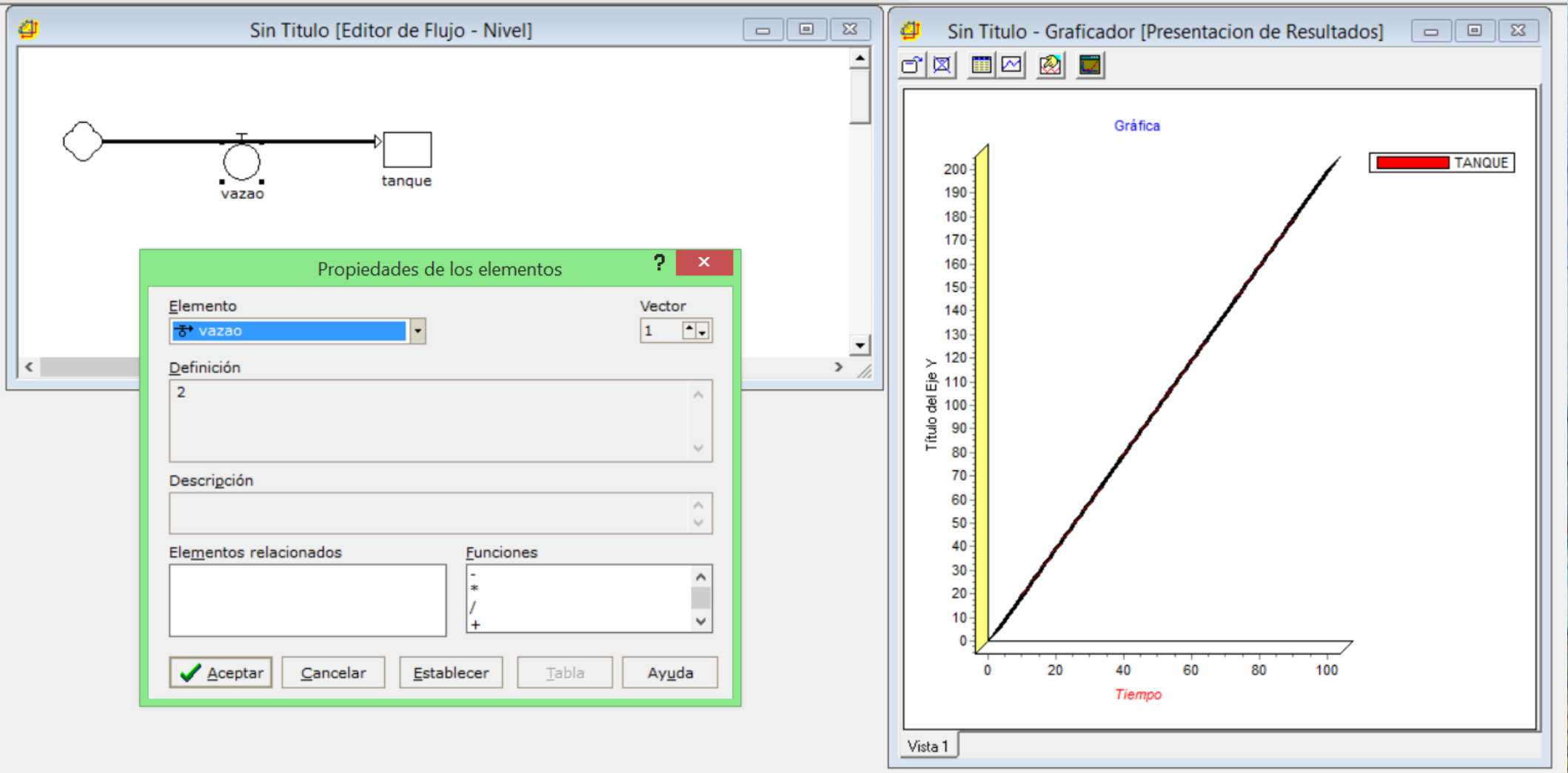
100 forms to tell the same thing

- Fluid Dynamics
- Math with robes

Proportions

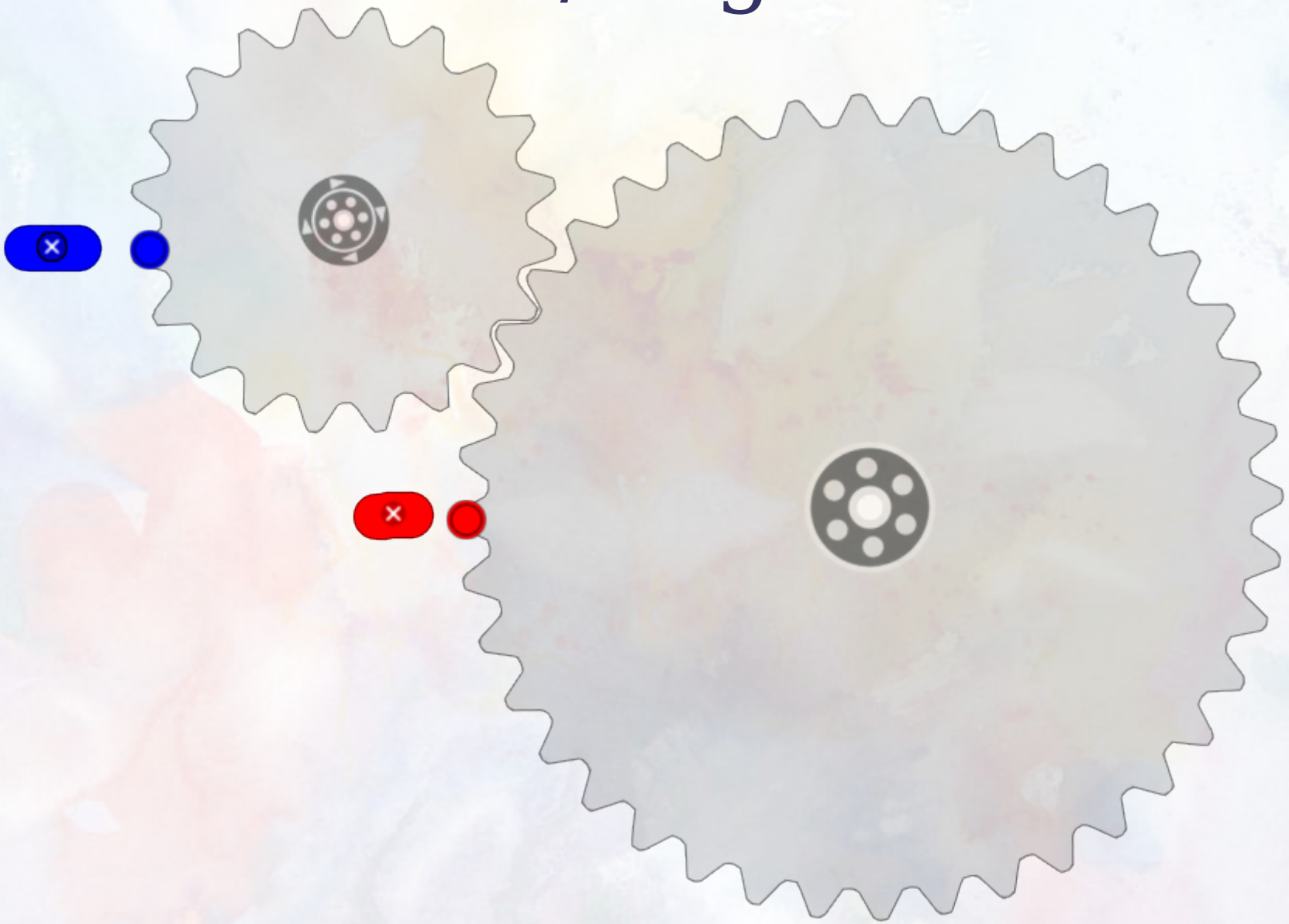
- How to learn the interpretation of:
  - Y = 2 * X

Evolución


Sin Titulo [Editor de Flujo - Nivel]
vazao
tanque
Propiedades de los elementos
Elemento
vazao
Vector
1
Definición
2
Descripción
Elementos relacionados
Funciones
-
*
/
+
Aceptar
Cancelar
Establecer
Tabla
Ayuda
Sin Titulo - Graficador [Presentacion de Resultados]
Gráfica
TANQUE
Título del Eje Y
Tiempo
Vista 1

Fluid Experiment

Phun / Algodoo



Predator x Prey

Autômato Celular

- Máquina abstrata
- Espaço celular
- Tempo discreto
- Regras baseadas na vizinhança

Jogo da Vida
Game of Life

- Inventado por John Horton Conway em 1970
- Regras

a) Menos de 2 vizinhos → morre

b) Mais de 3 vizinhos → morre

c) 2 ou 3 vizinhos → continua vivo

d) 3 vizinhos → nasce

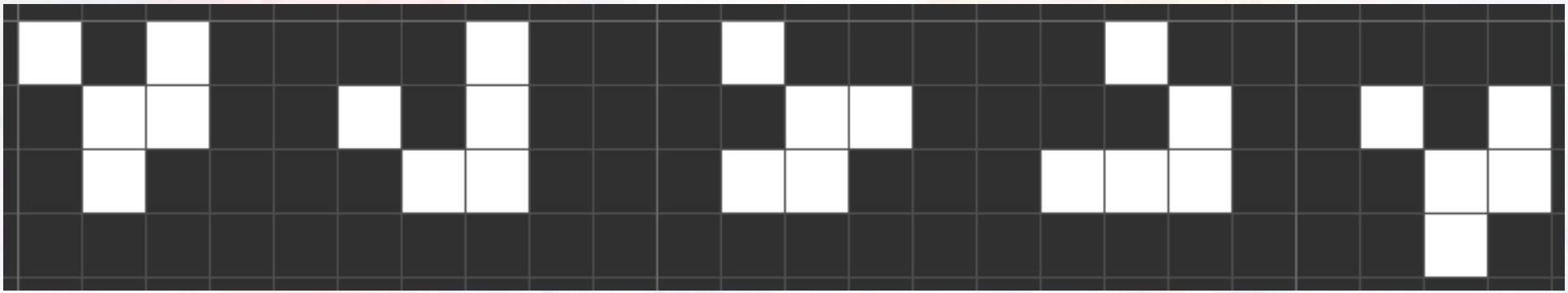
Golly

http://golly.sourceforge.net

Padrões Espaçonave

Glider

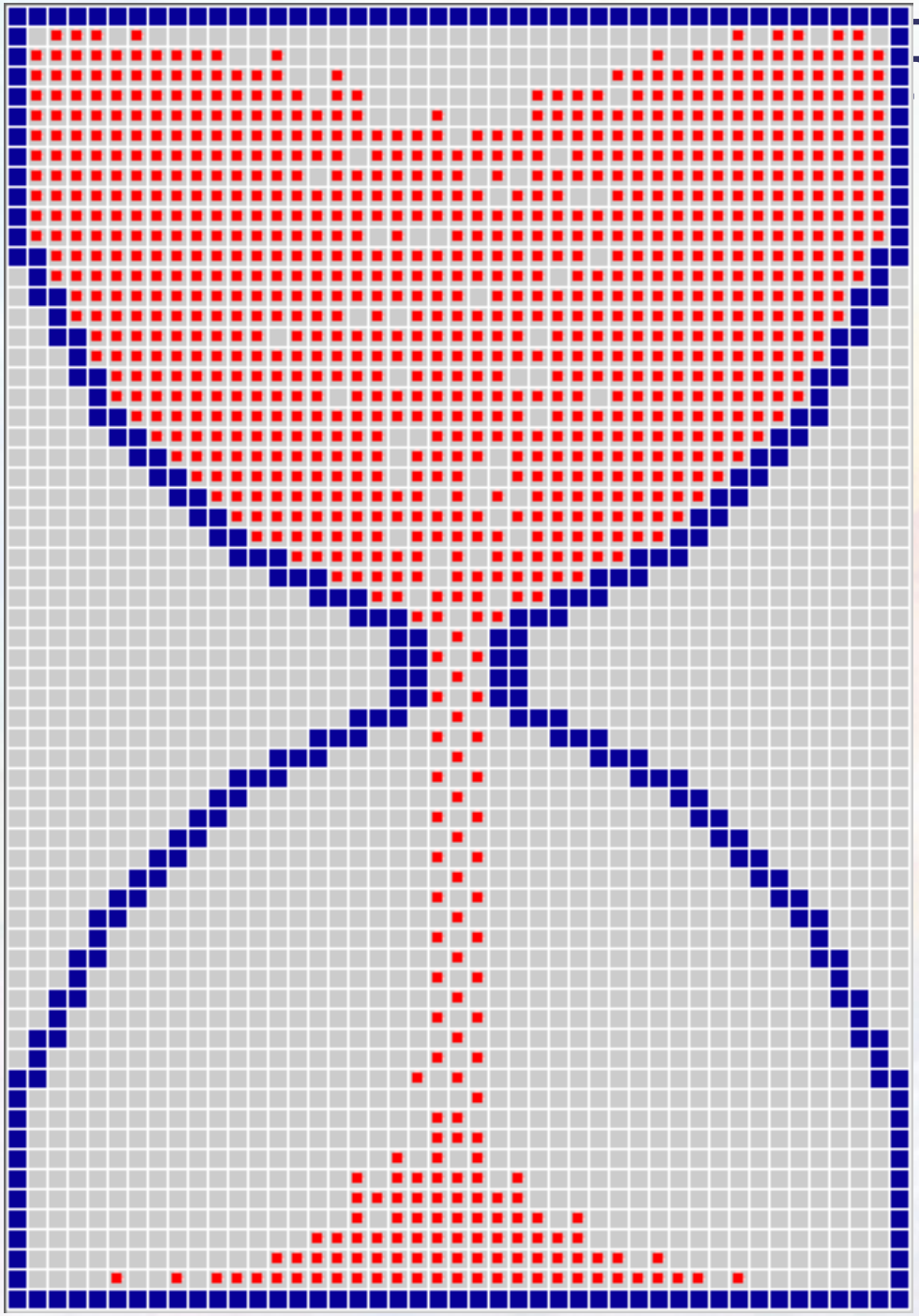
Richard K. Guy – 1970



Worldmaker

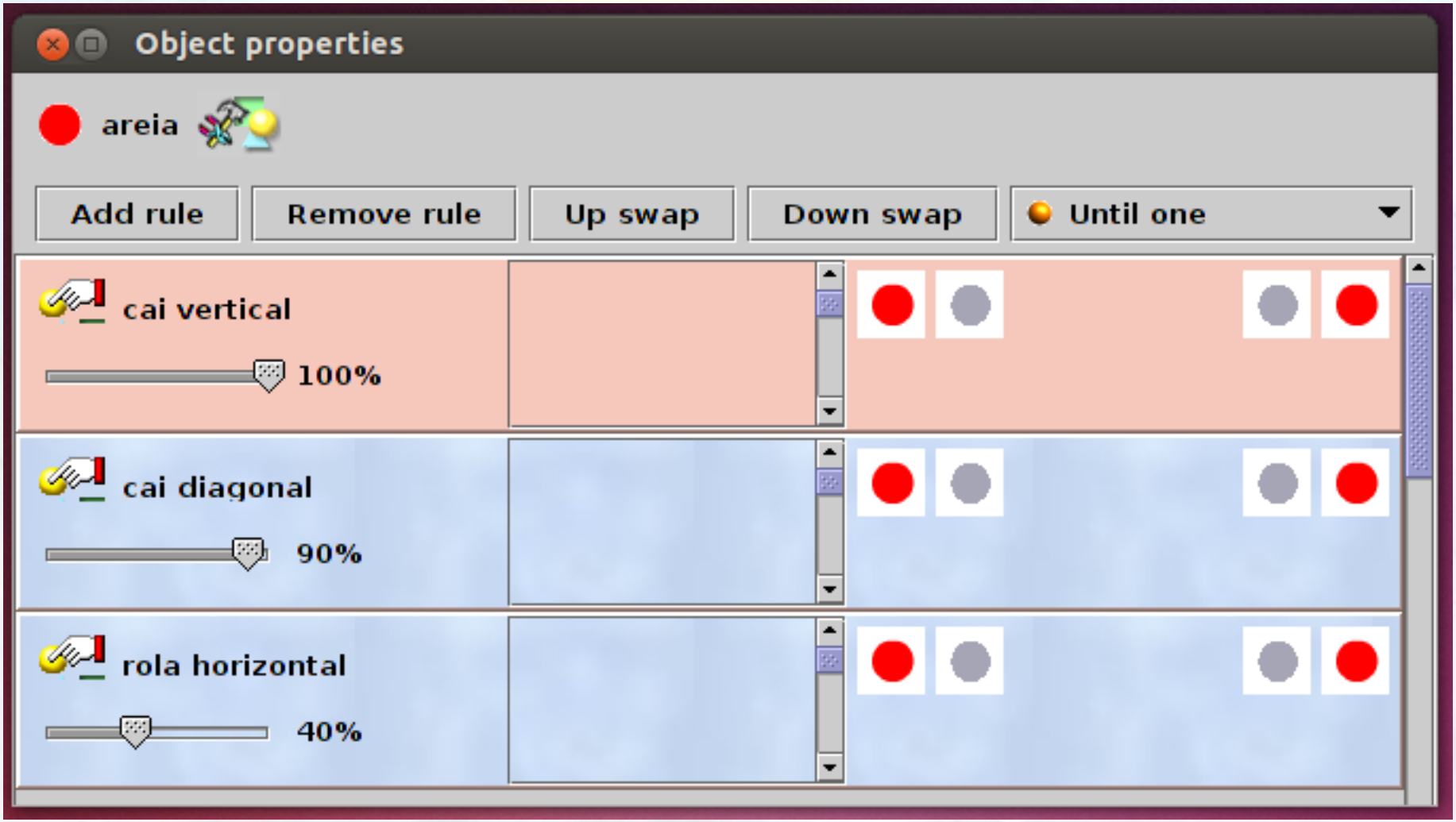
Centre for Information Technology in Education (CITE)
University of Hong Kong

http://worldmaker.cite.hku.hk

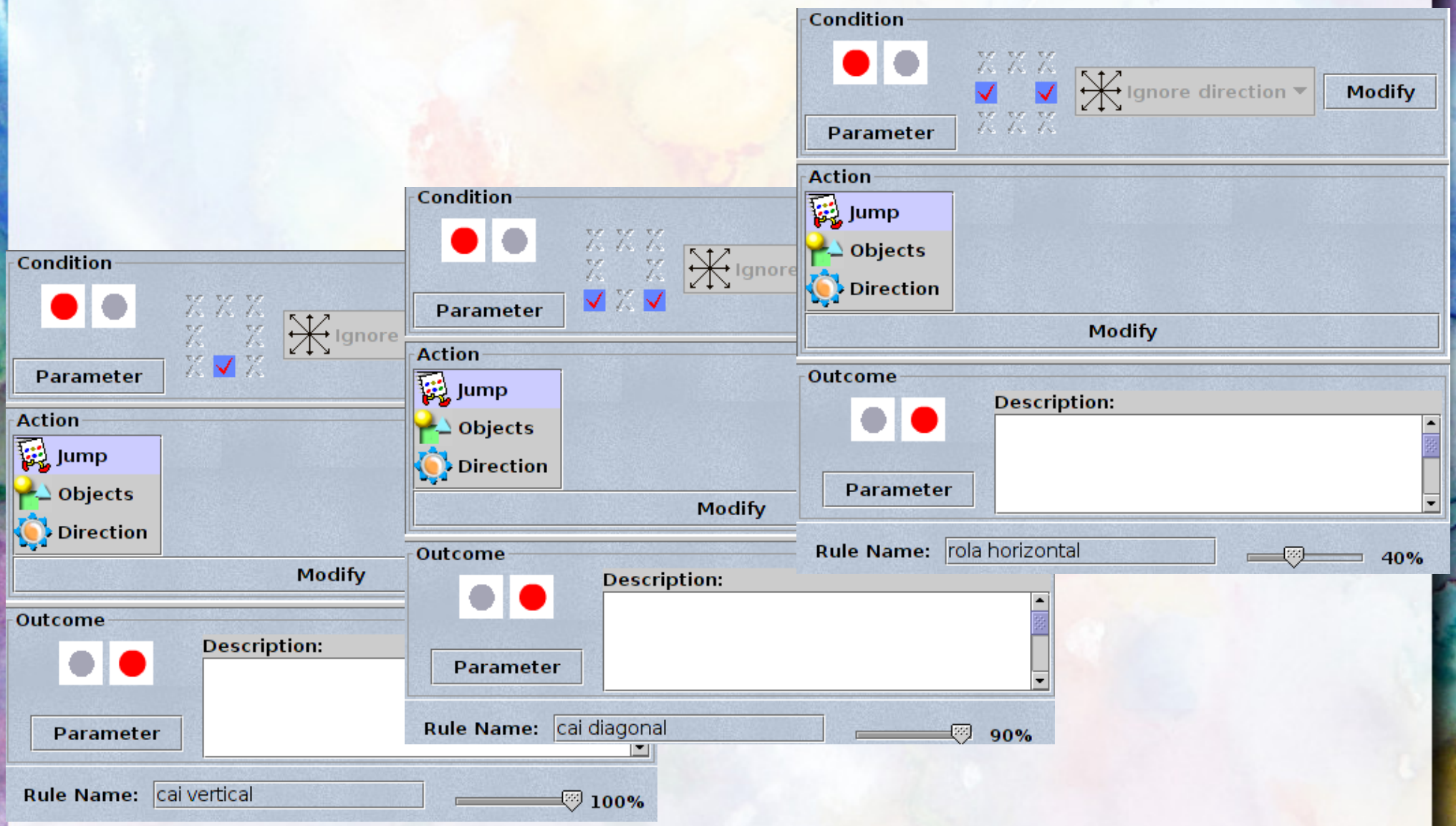


Relógio de Areia Worldmaker

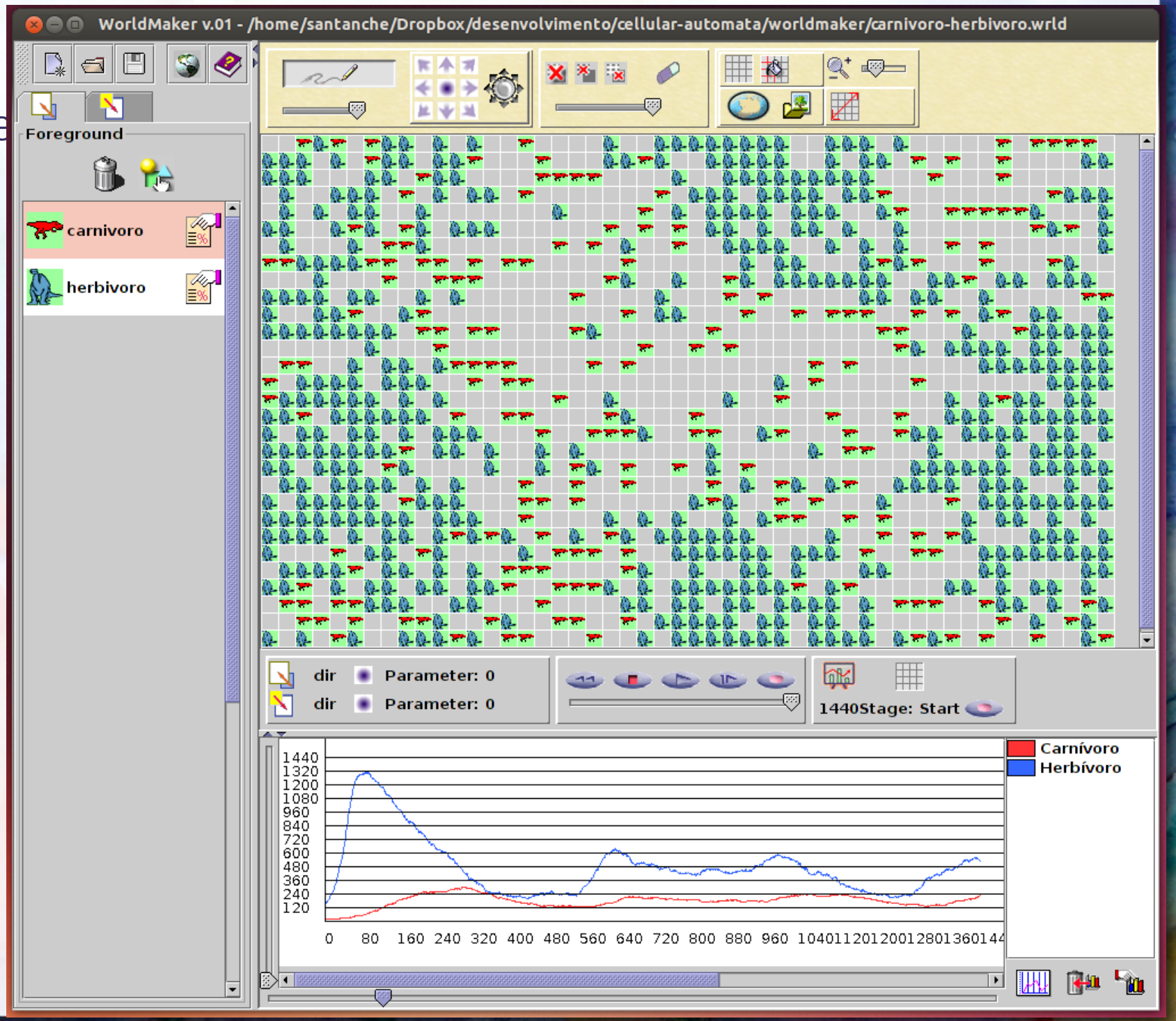
Relógio de Areia
Worldmaker



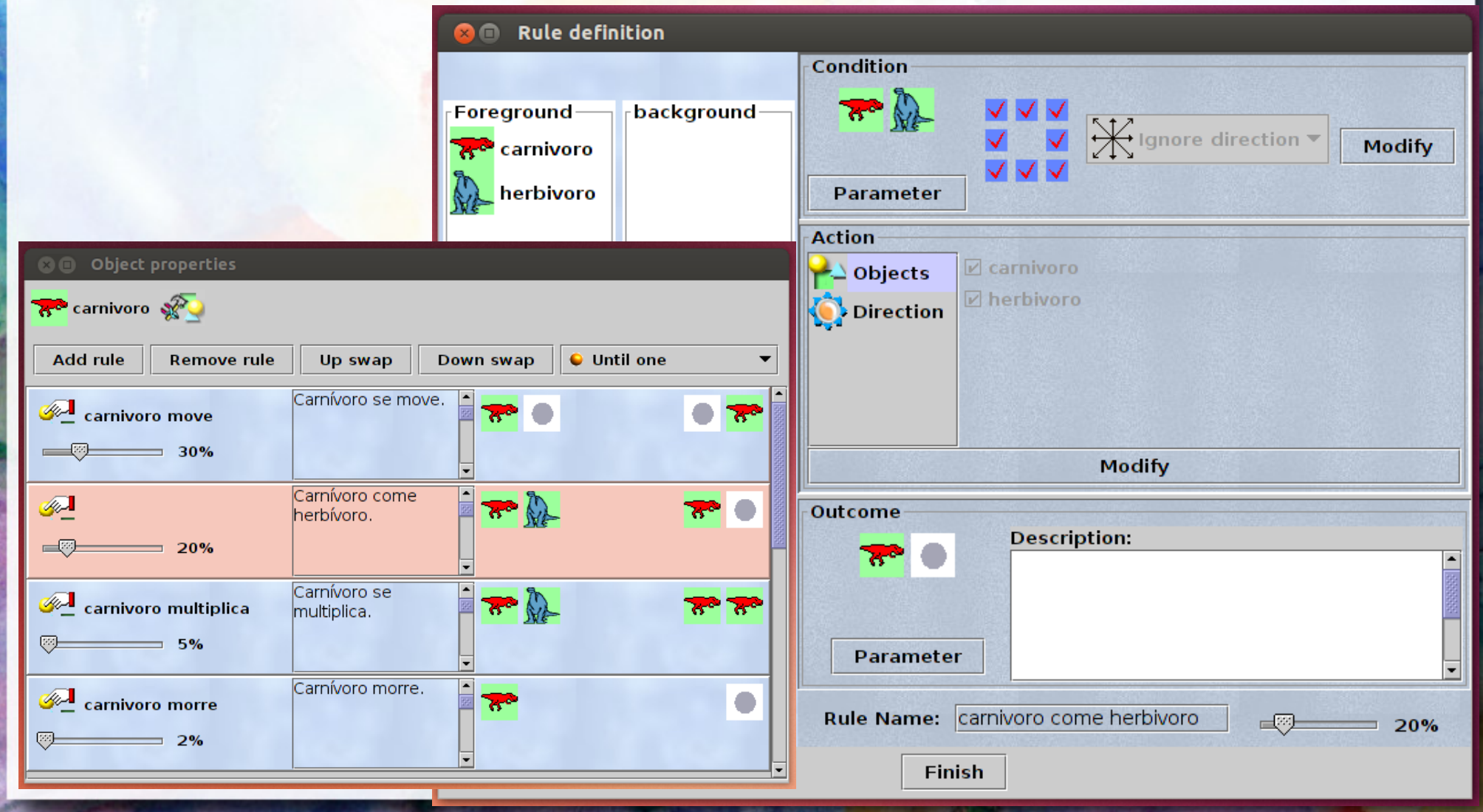
Relógio de Areia Worldmaker



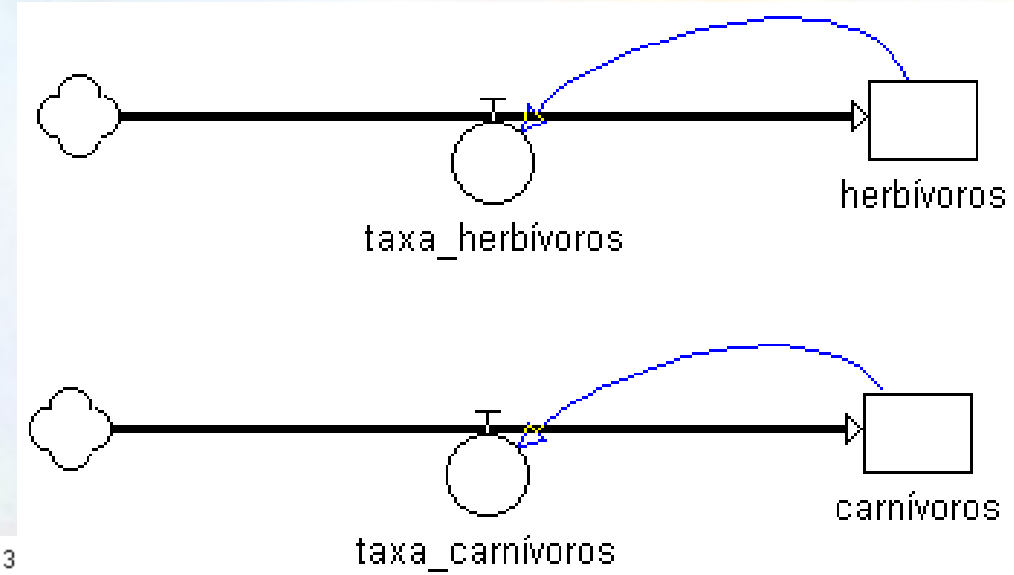
Worldmaker Predator x Prey

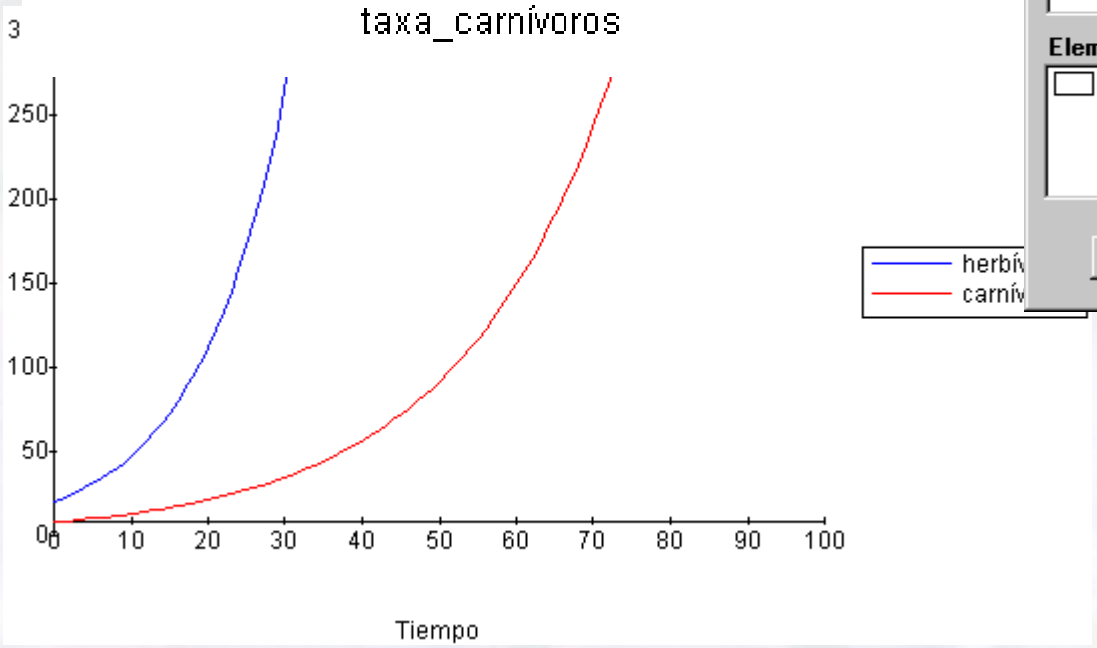


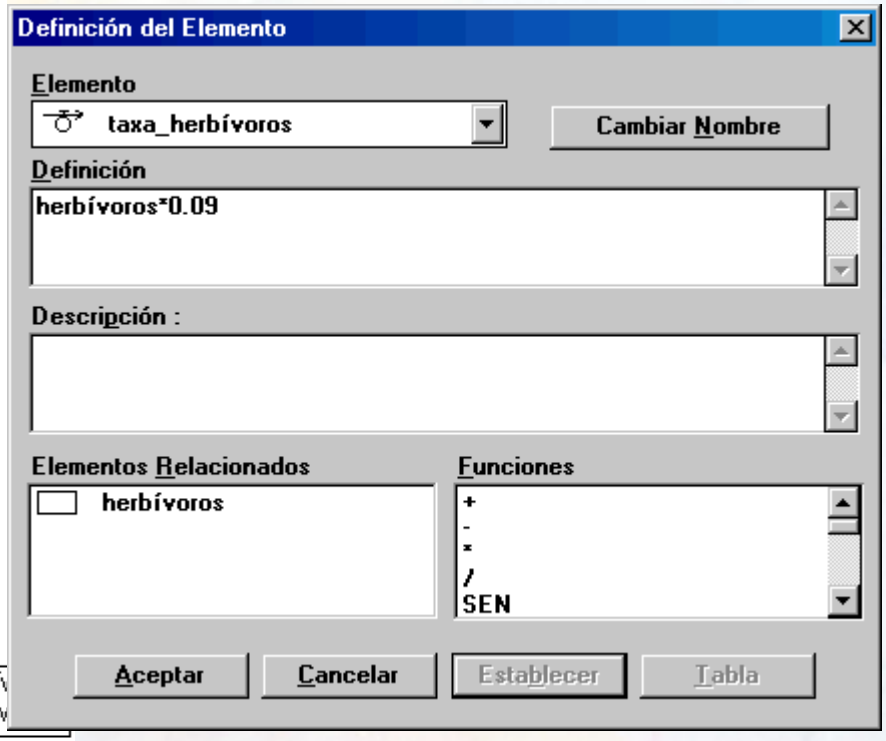
Worldmaker
Carnívoros × Herbívoros



Predator x Prey - Evolución





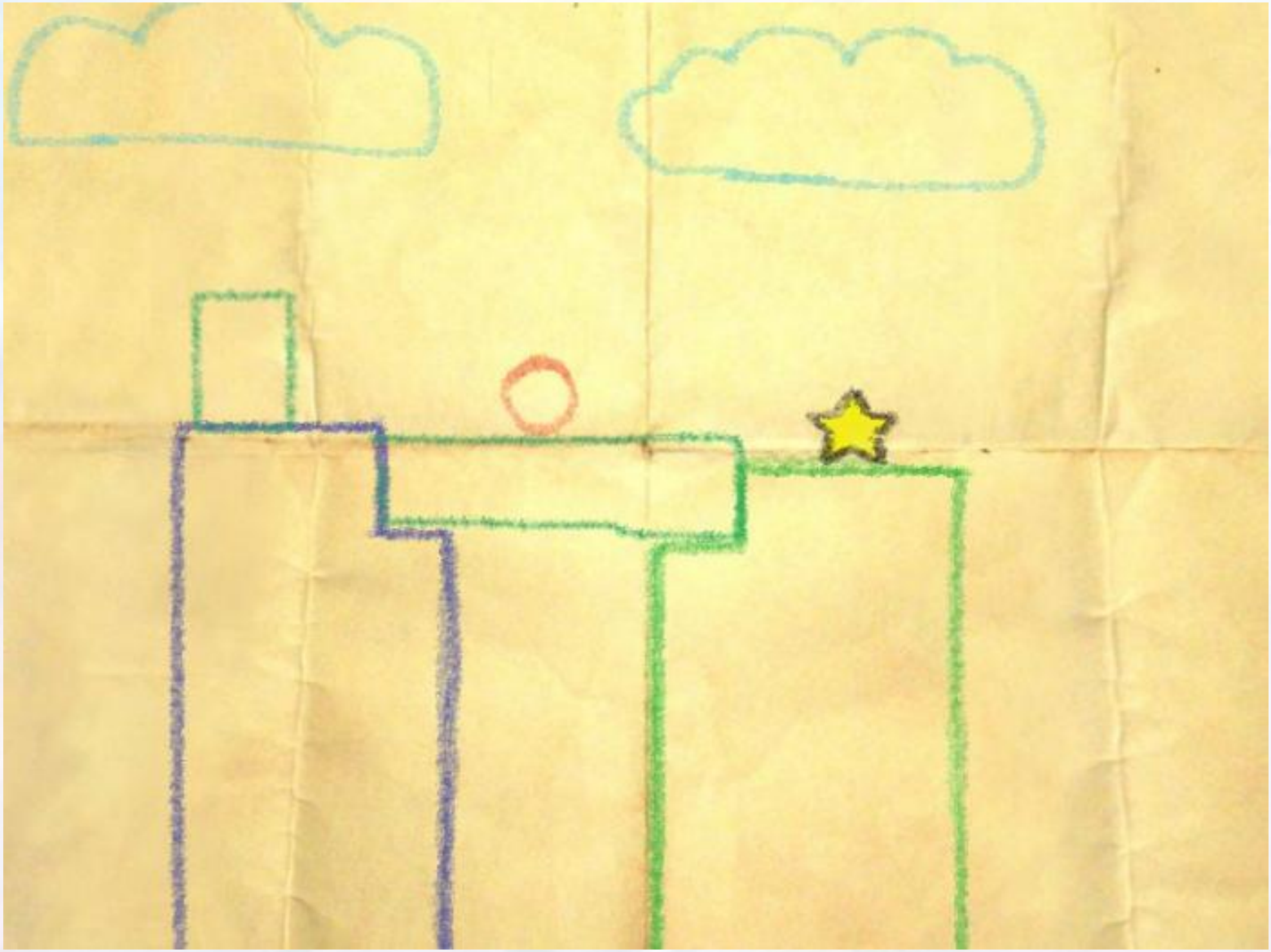


The Incredible Machine

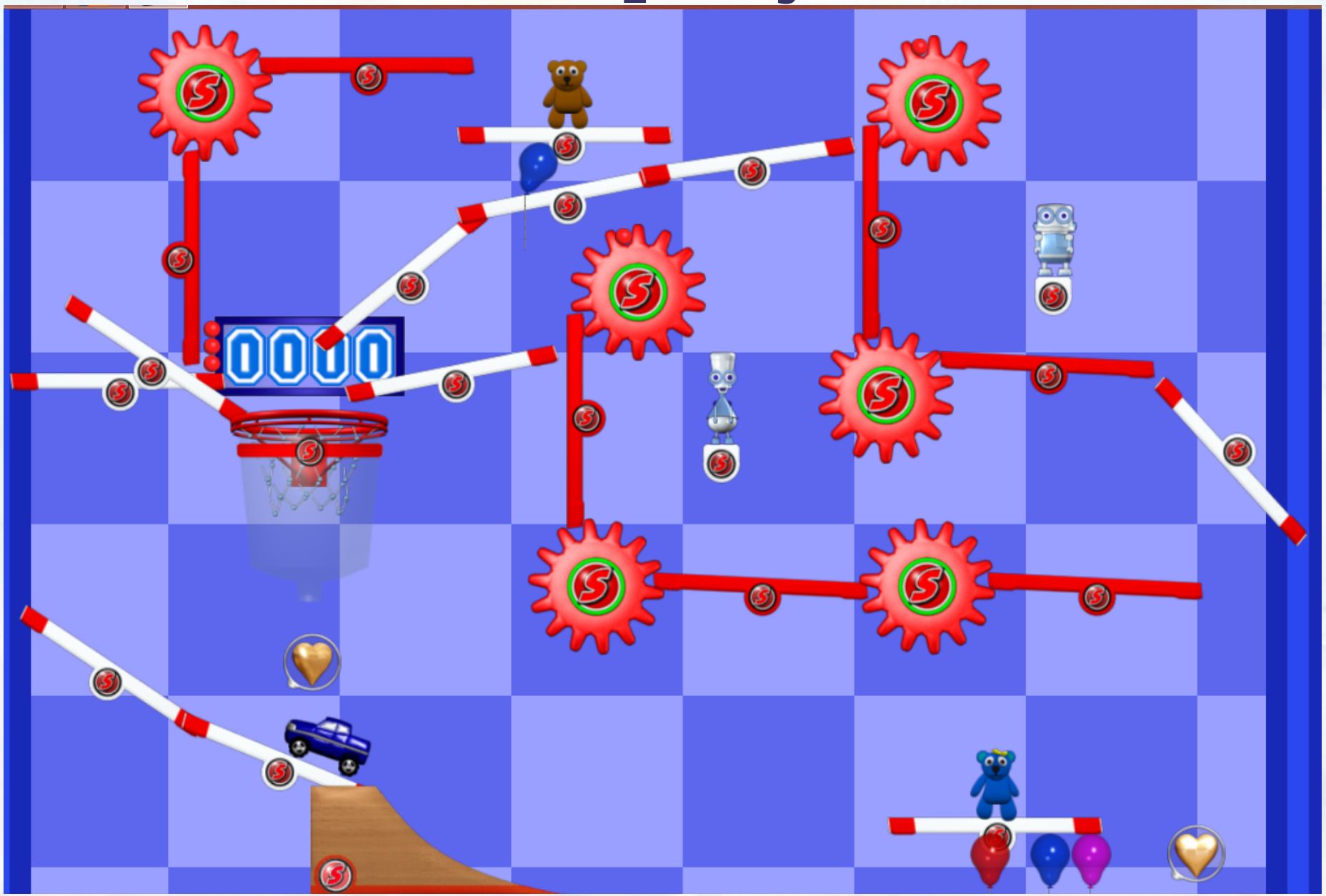
The Incredible Machine

Crayon Physics

http://www.crayonphysics.com

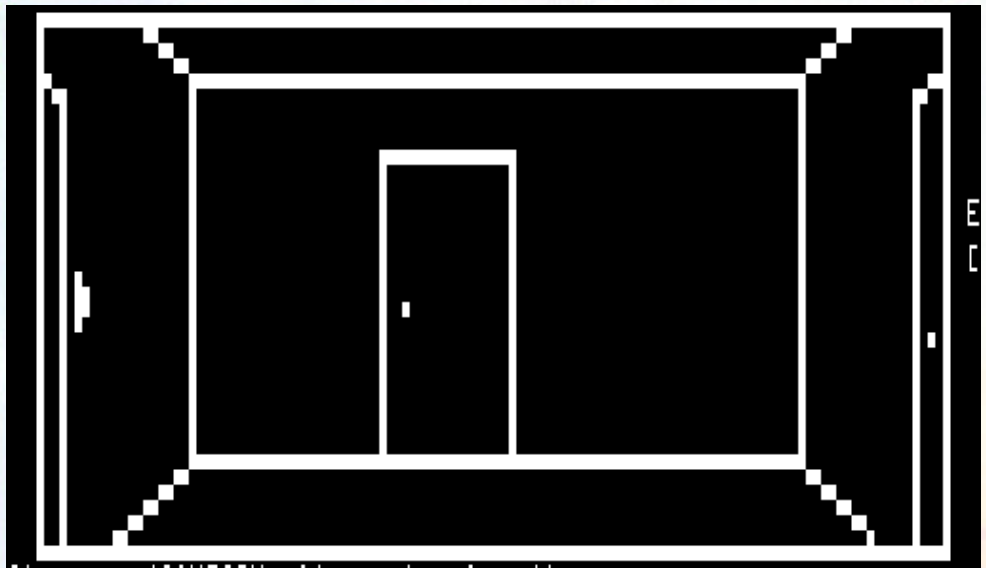


SoupToys

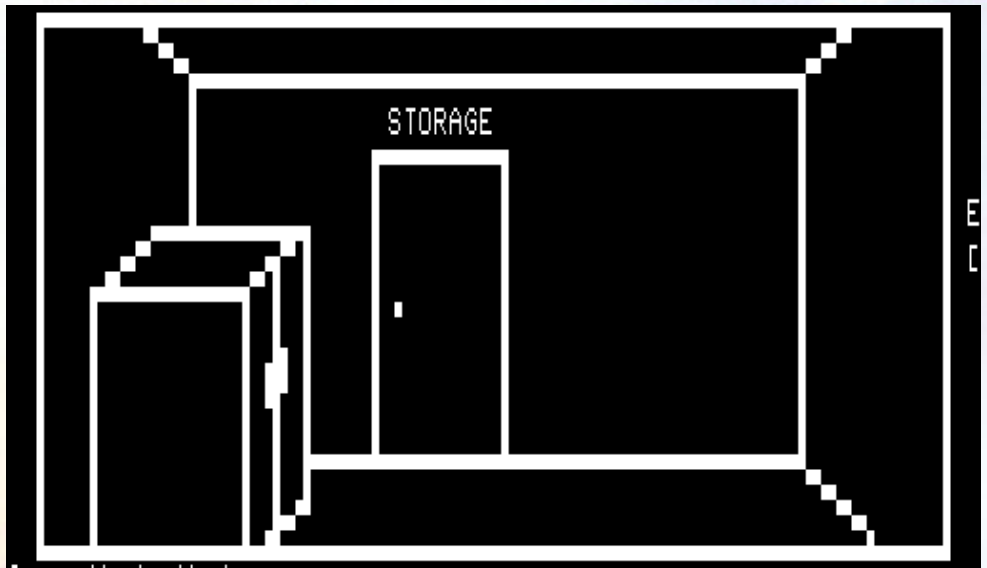


My Secret Door

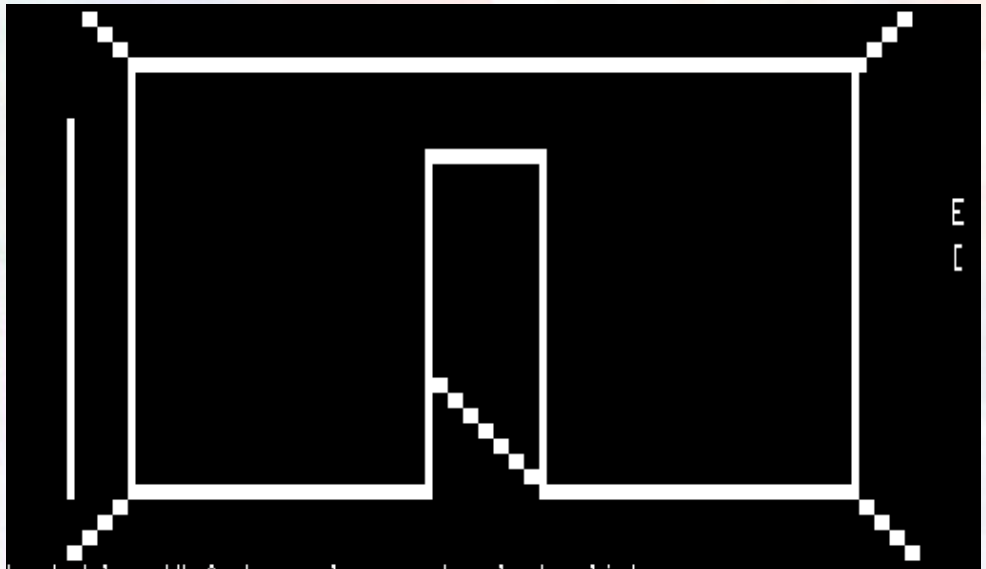
Inspiration



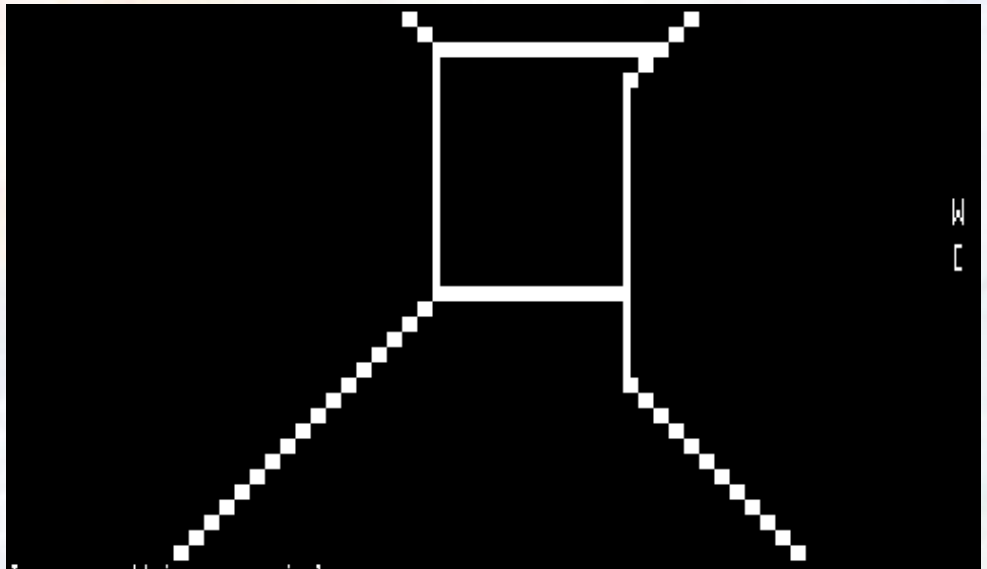
It says: 'CAUTION: Air vents closed'
Your command? TURN RIGHT
I see an obvious exit.
Your command?



I can't do that.
Your command? TURN RIGHT
I see an obvious exit.
Your command?



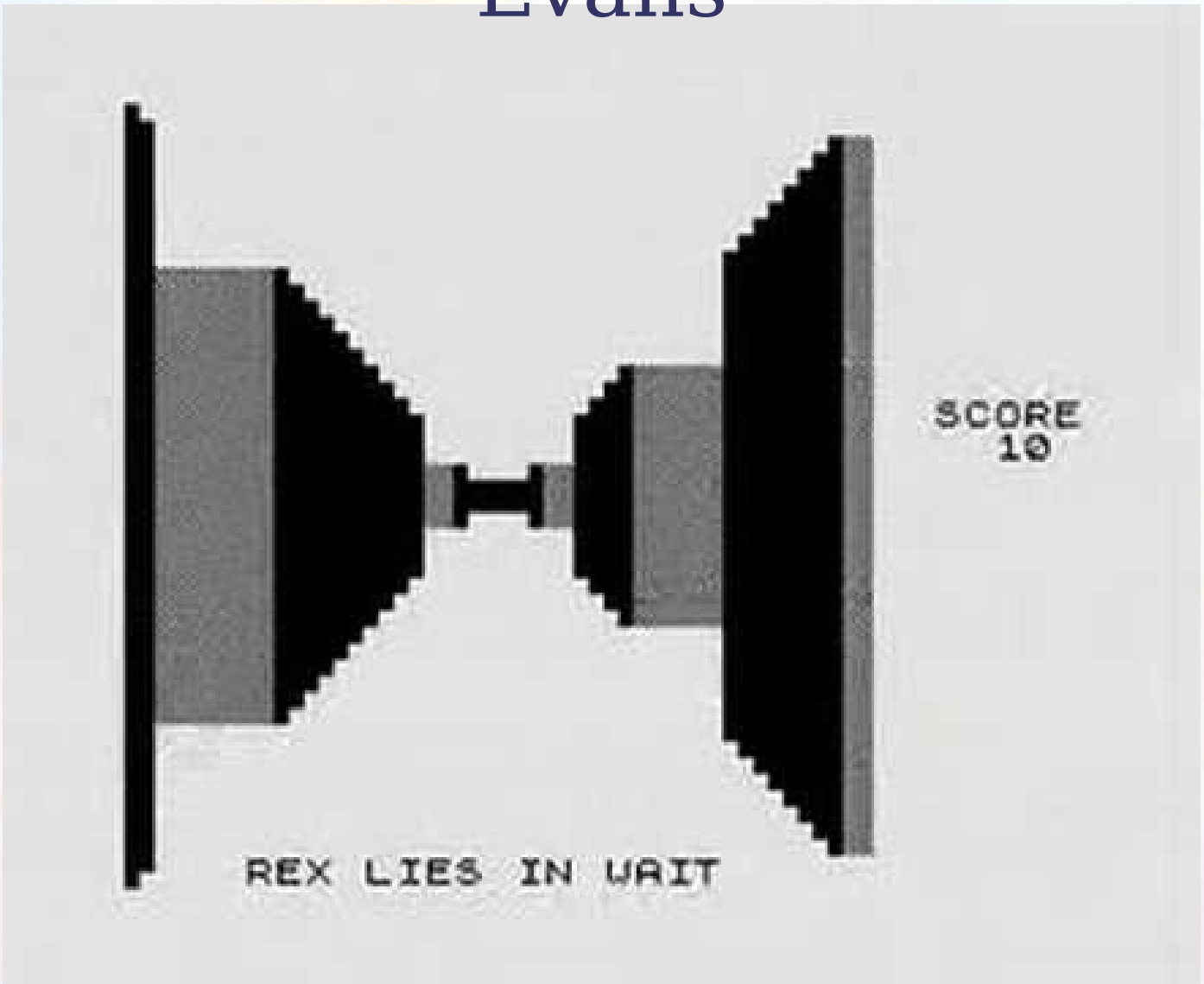
bomb blows!" A door slams and a lock clicks.
Your command? TURN RIGHT
I see an exit.
Your command?



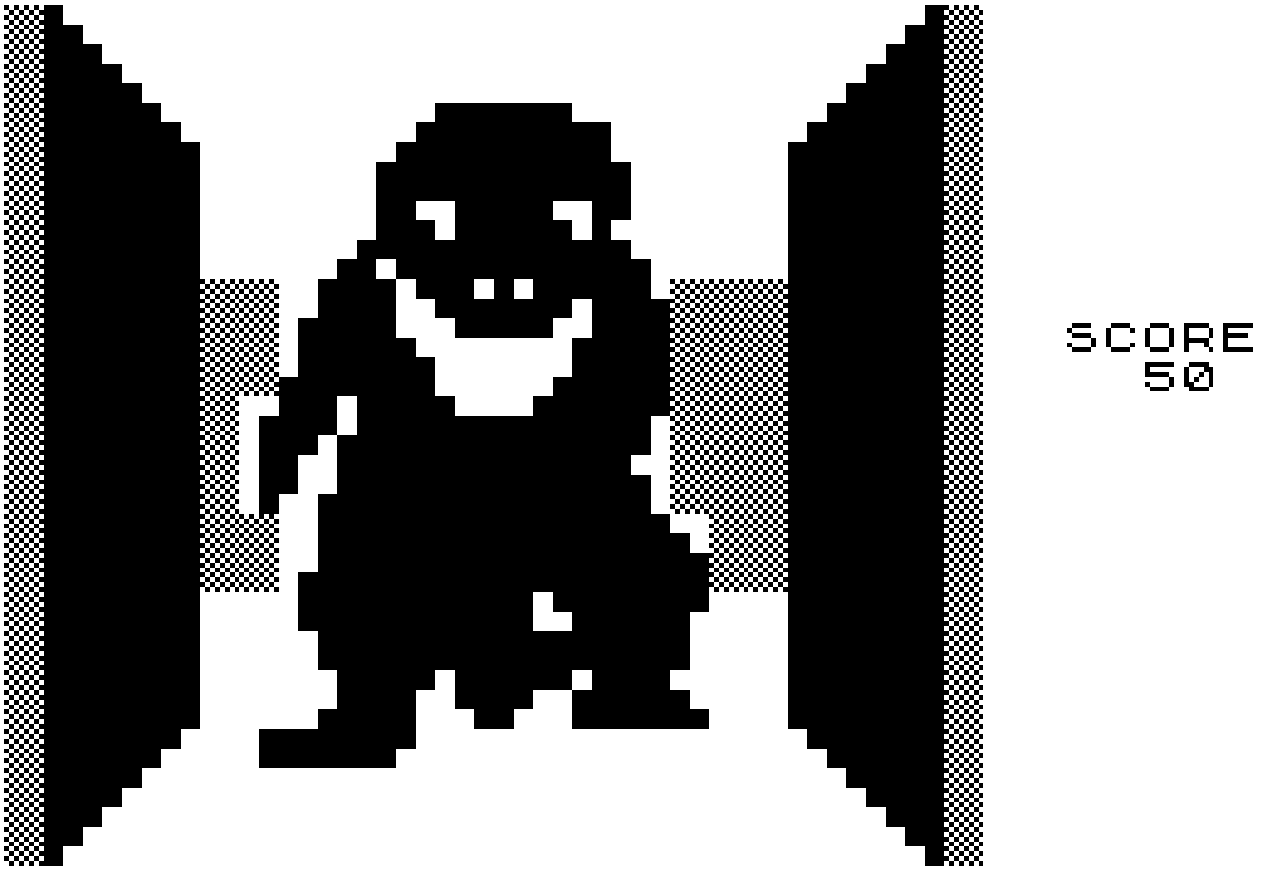
I see nothing special.
Your command? TURN RIGHT
I see an exit.
Your command?

Inspiration

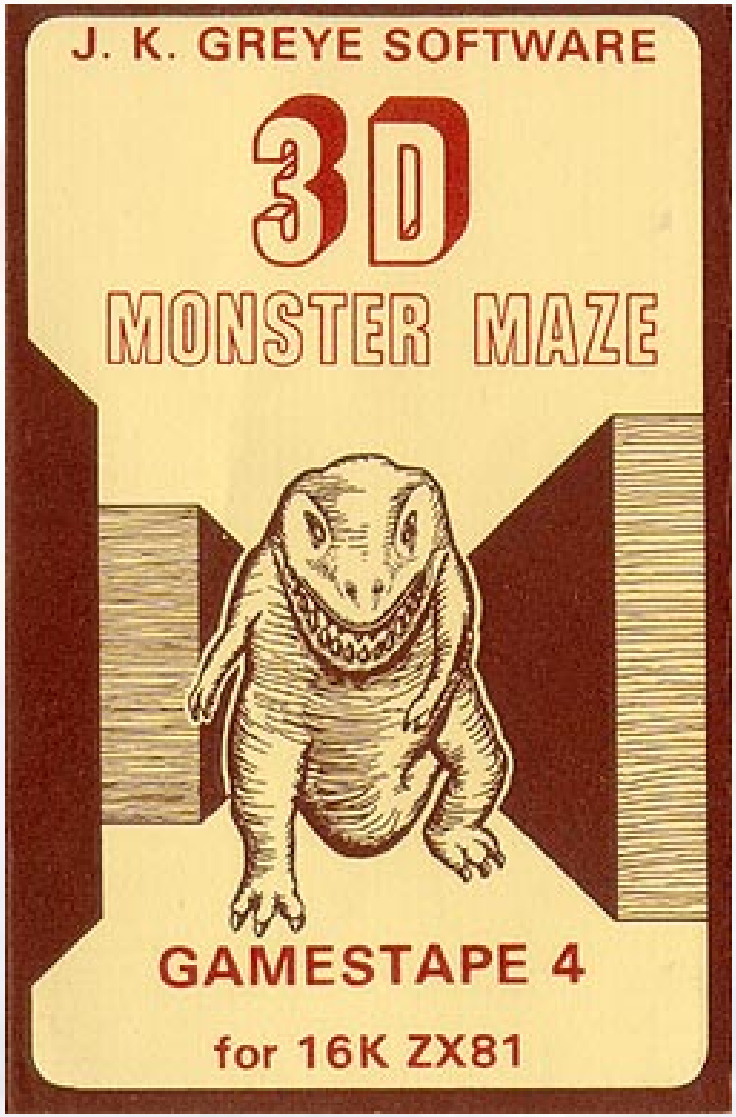
3D Monster Maze – ZX-81 - Malcolm Evans



Inspiration
3D Monster Maze

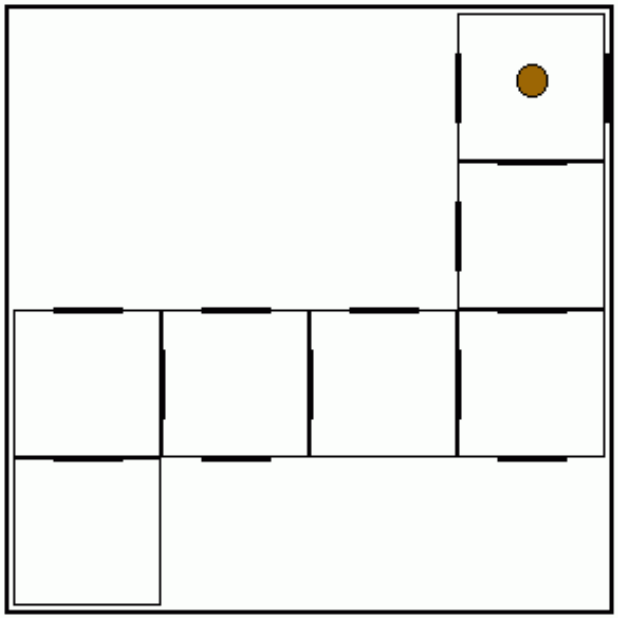


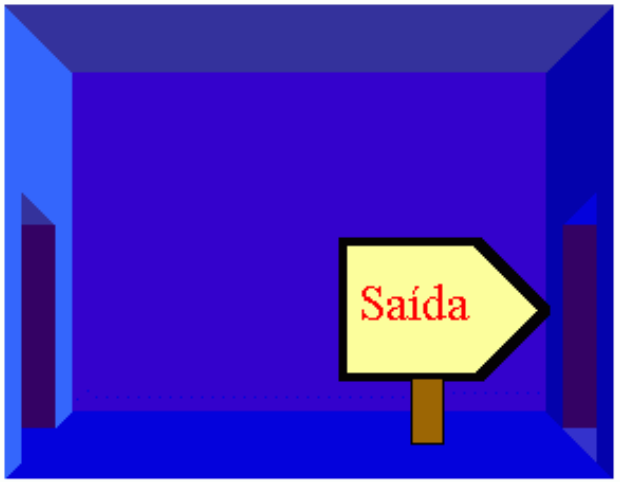
3D Monster Maze Tape Cover!

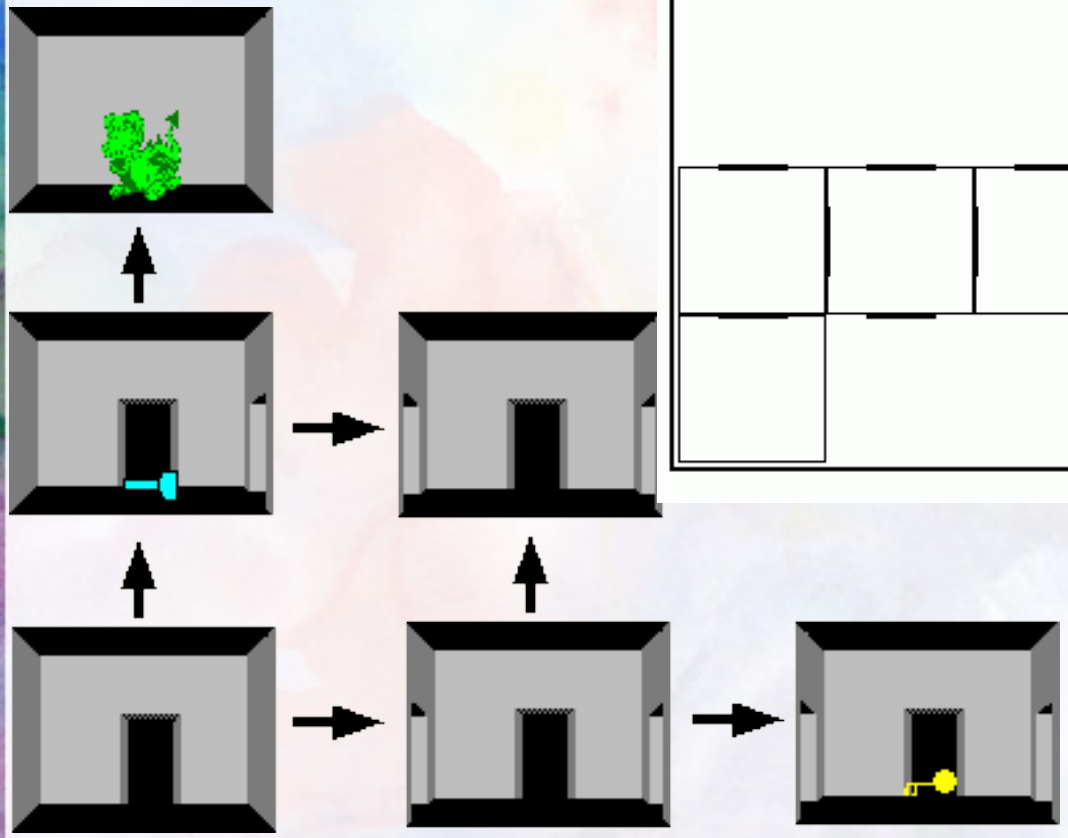


Castelo de Cristal

Aqui é a saida, mas a porta está trancada! Para que você possa sair, precisa encontrar 3 chaves.







Aperte <ENTER>

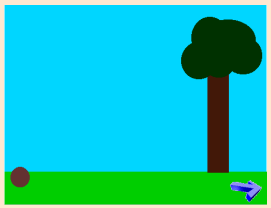
Origens
Casa Mágica

- Ambiente de autoria educacional
- Propicia a colaboração entre professores e alunos em projetos
- Abordagem baseada em componentes
- Projetado para autores não especialistas

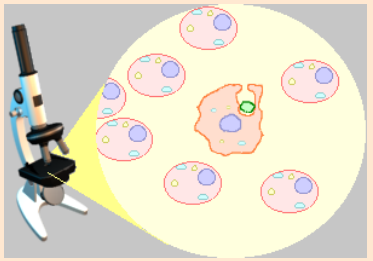
Pieces of the House Application

composition of

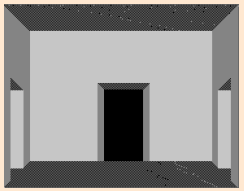
Place



Place



Place



composition of

Component

Component

Component

Casa Mágica 1

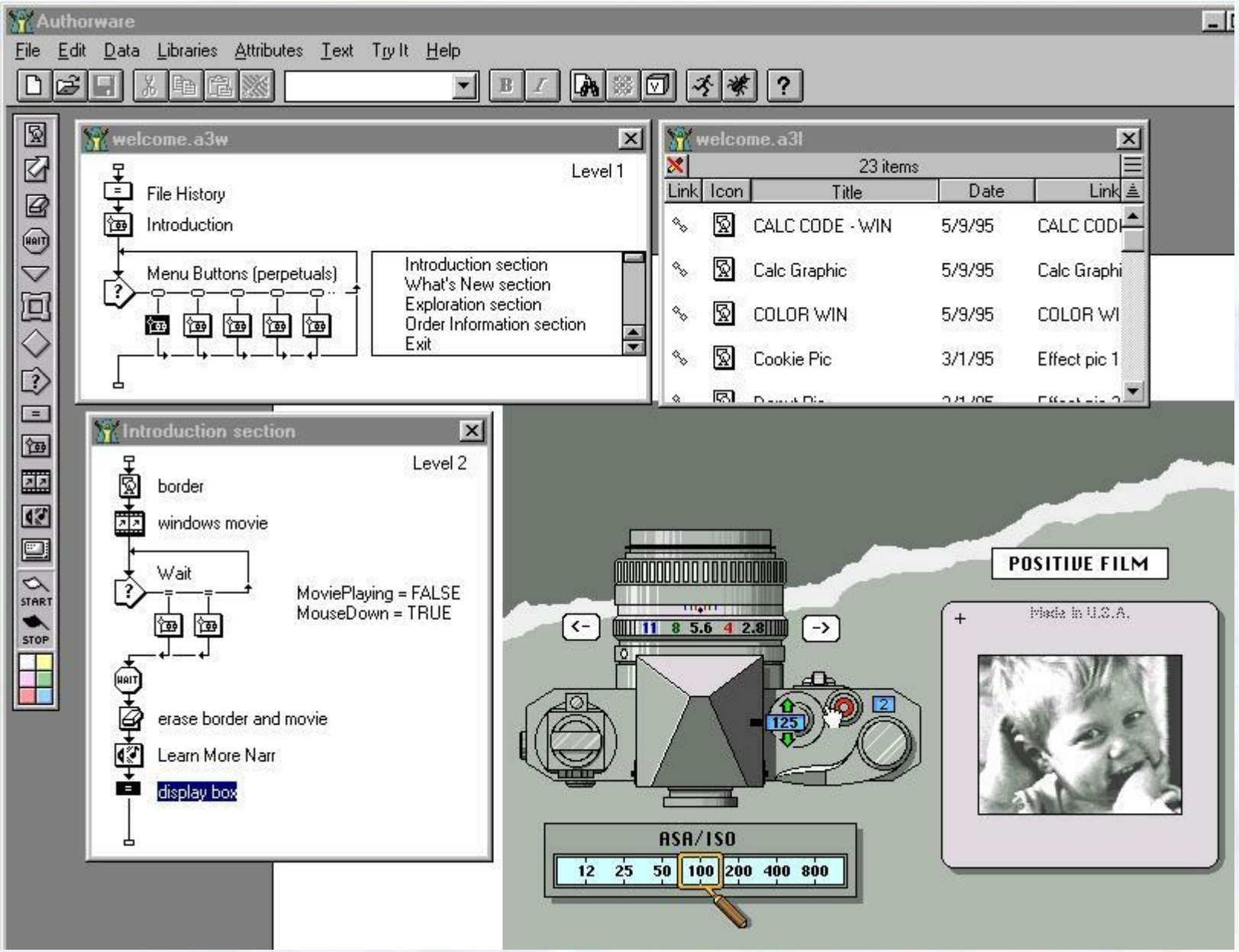
- Project started in 1994.
- In 1997 new version rewritten from scratch adopting Java.
- In 2002 it was integrated with Anima.
- Won: Concurso Nacional de Software Tecnológico e Educacional 1994, MEC

Casa Mágica

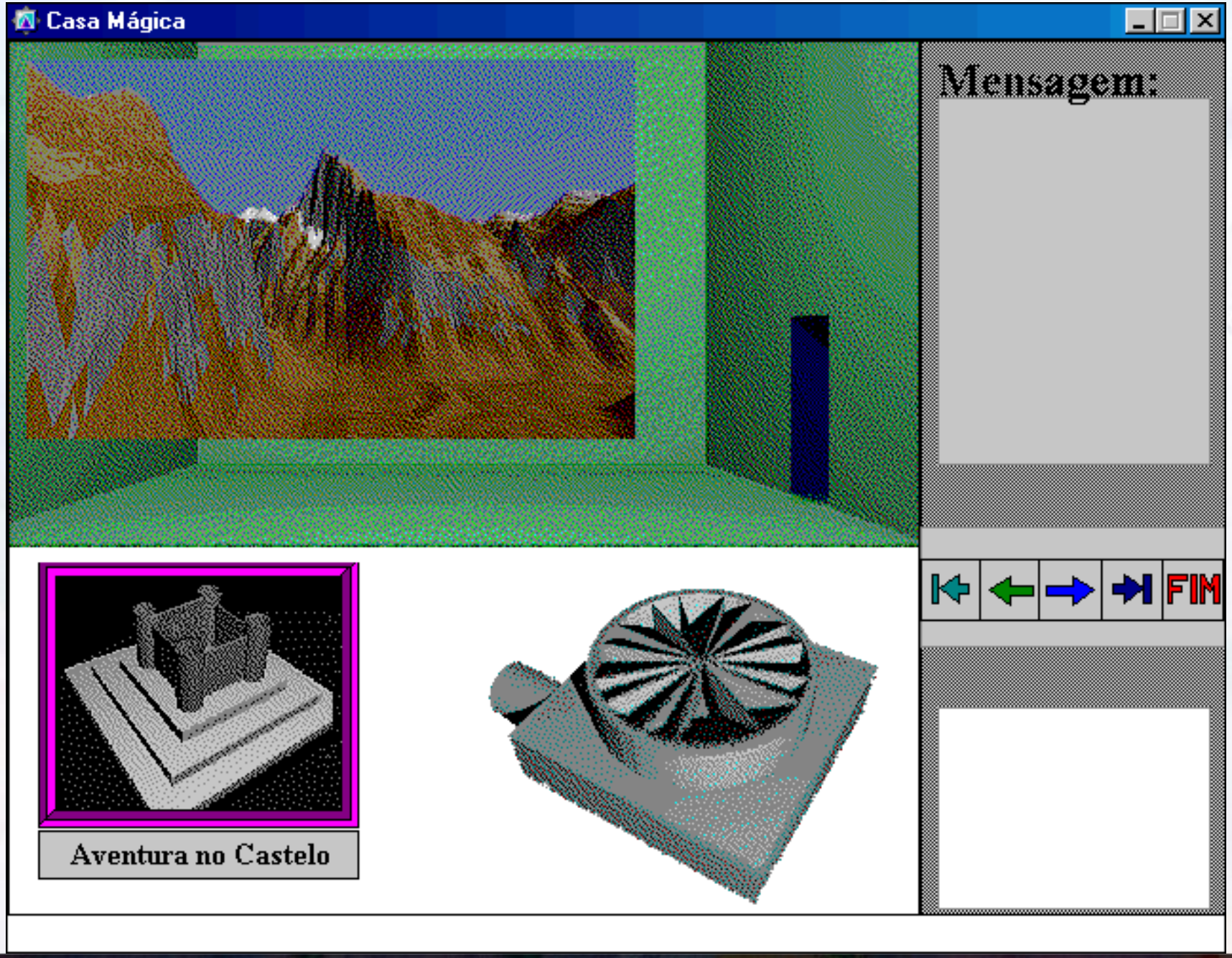
- Authoring
- Components
- Narrative
  - places

Authoring - Authorware

Multimedia Authoring Using Authorware
by Edward Chow
http://cs.uccs.edu/~cs525/awm/awm.ht



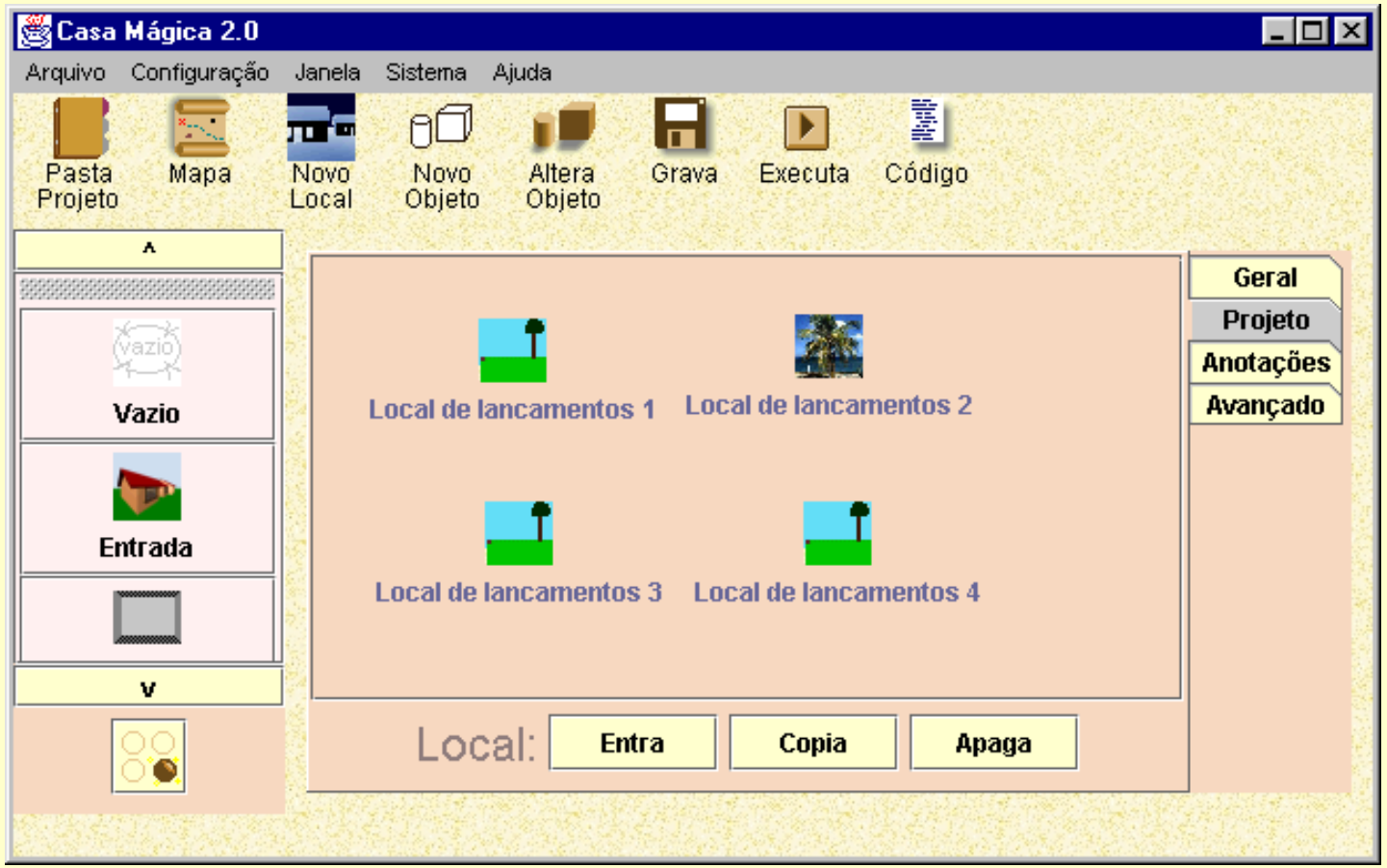
Casa Mágica 1



Magic House 2

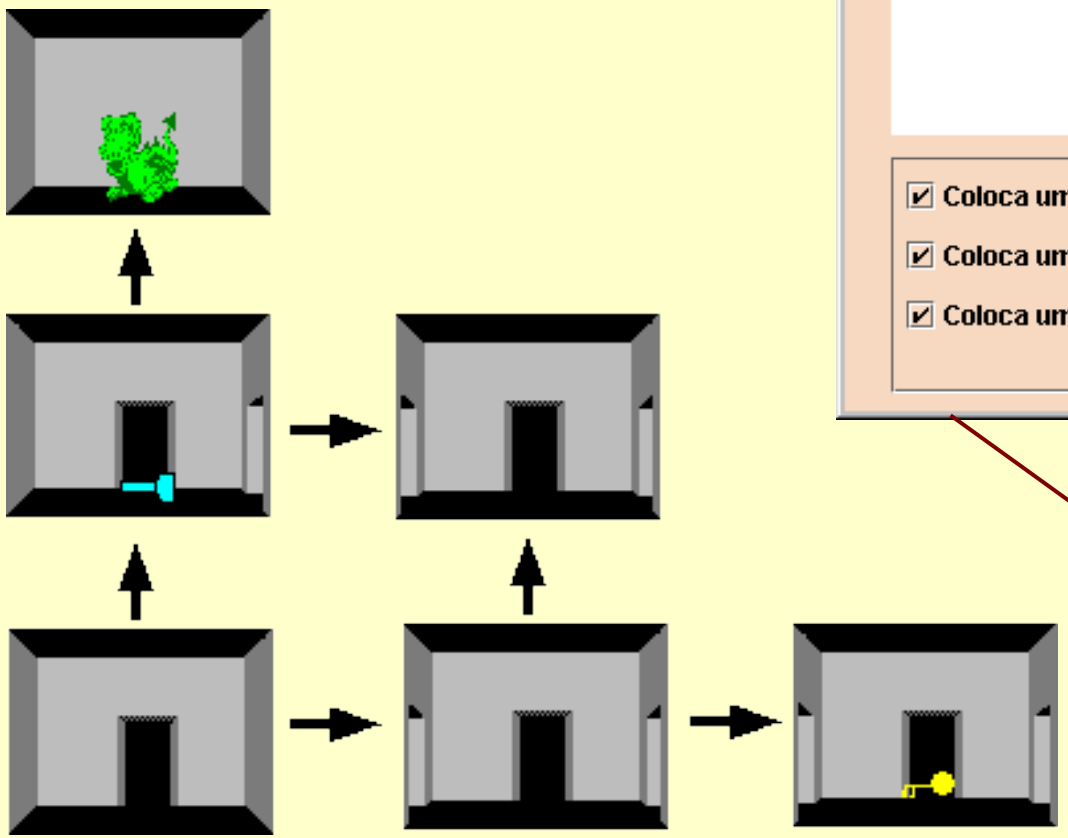
Casa Mágica

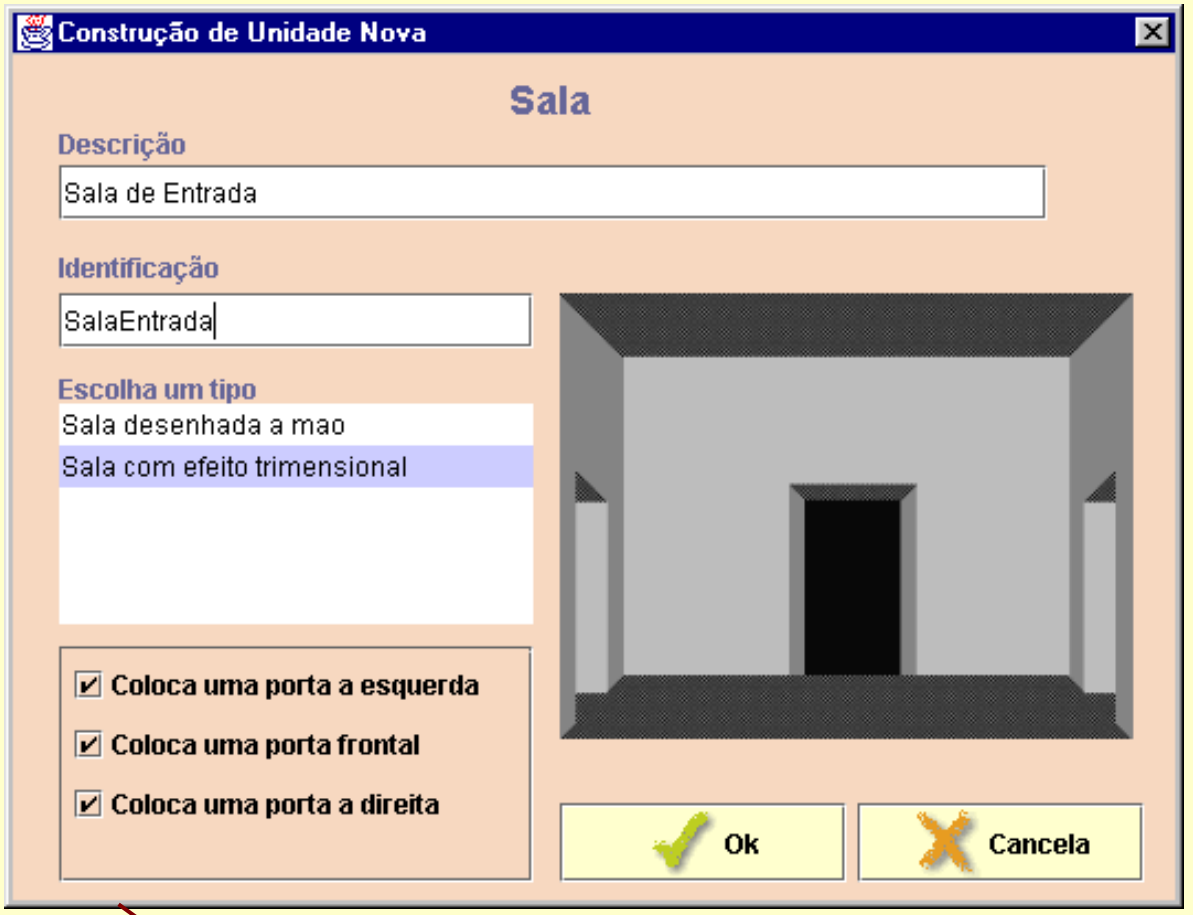
Constitui-se em um ambiente para construção de aplicações educacionais que combina os recursos de uma ferramenta de autoria com recursos que permitem a construção e exploração de modelos de estudo.



Casa Mágica

Locais de um Mundo interligados por Passagens

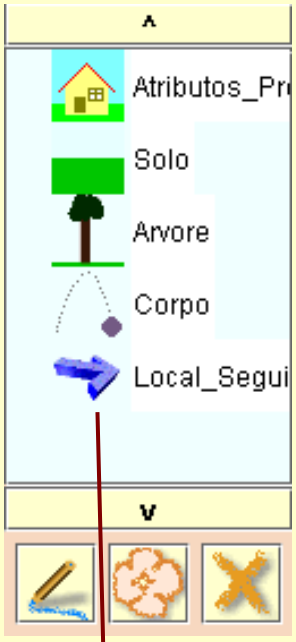


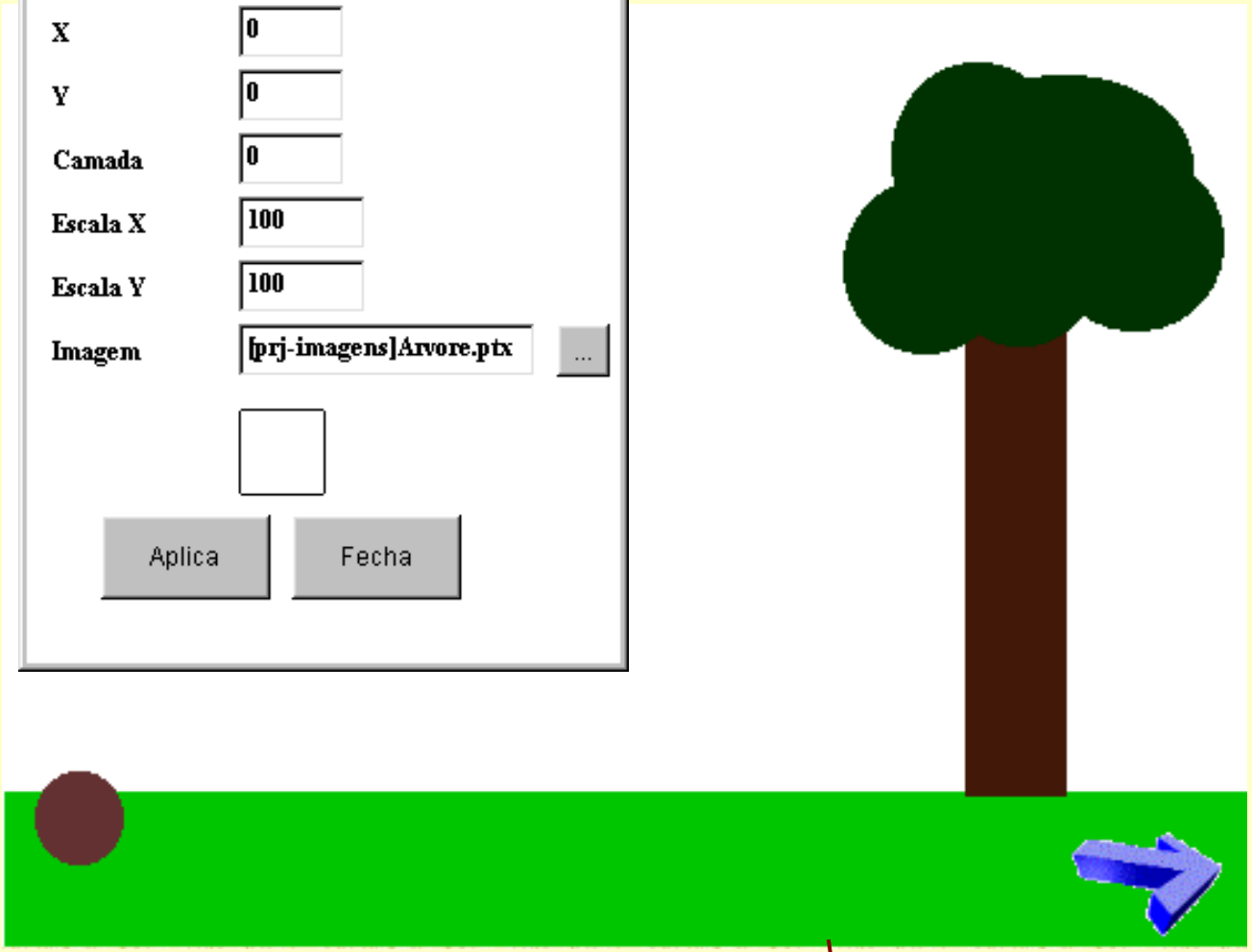


Assistente para construção de Locais

Casa Mágica

Visor





Objetos do Local

Local

Classes

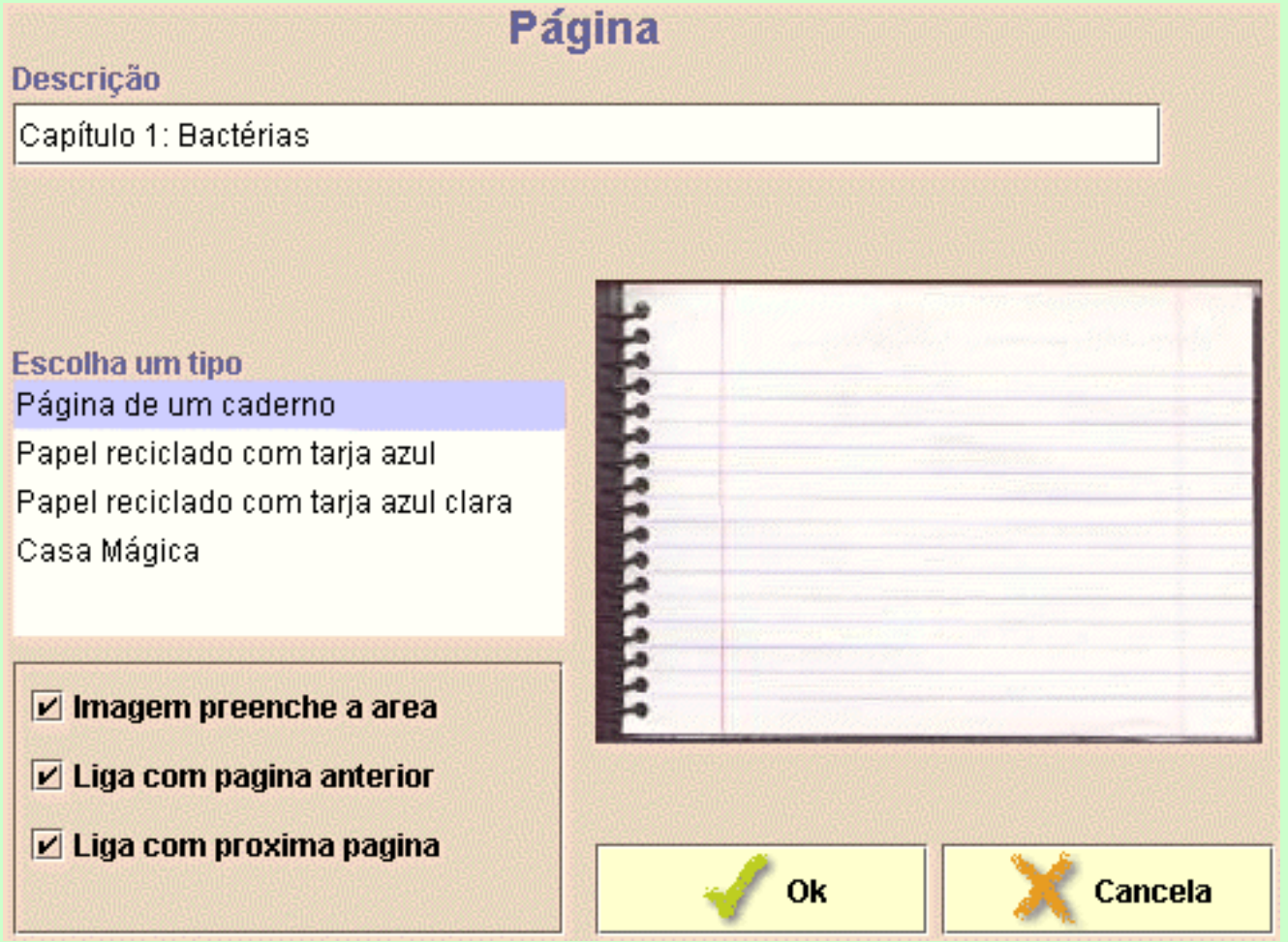
Escolhendo a Metáfora de Trabalho

- A construção dos ‘locais’, na segunda versão do sistema Casa Mágica, inicia-se com a escolha de uma metáfora sobre a qual o modelo será concebido:
  - Facilita a concepção da idéia
  - Traduz um direcionamento em que o trabalho será desenvolvido

Assistentes

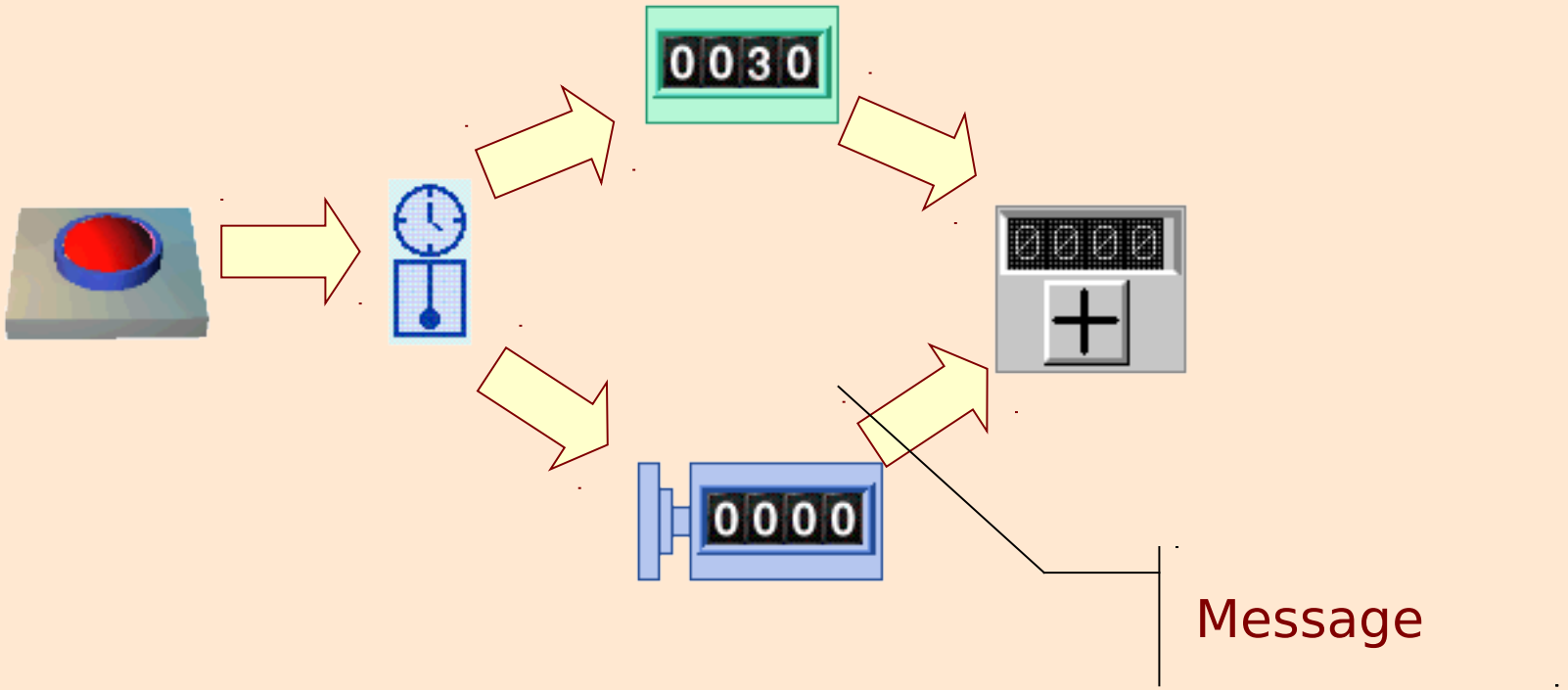
Utilizando os assistentes, o autor monta os blocos básicos de organização do cenário.

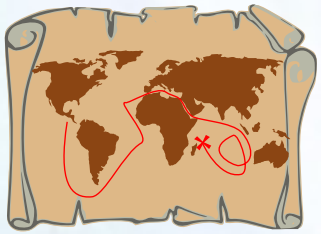
Assistentes



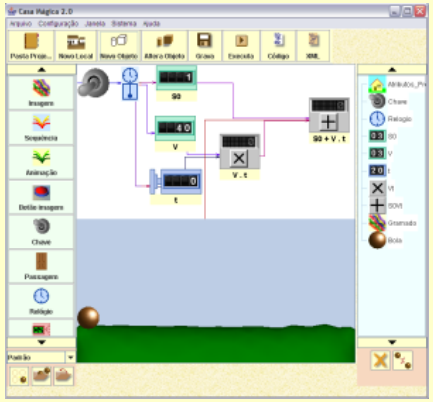
Composition

- Based on combination of linked components that interchange messages.

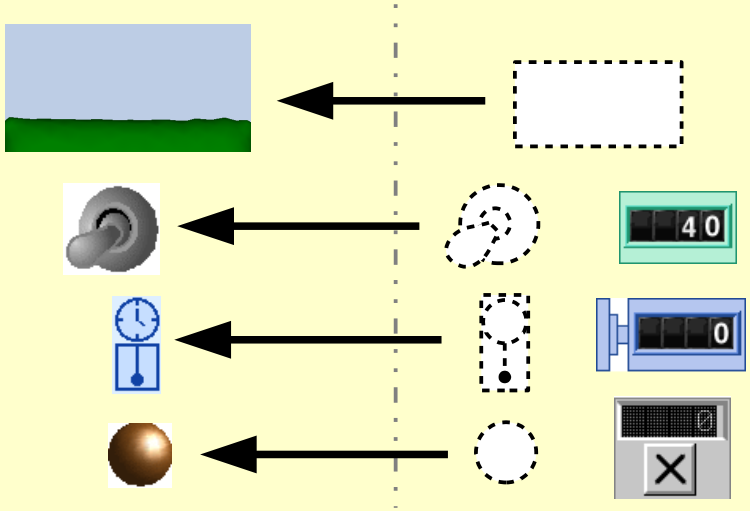




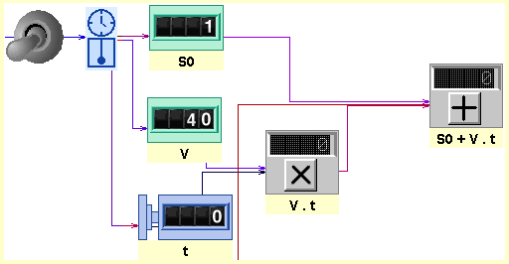
Casa Mágica



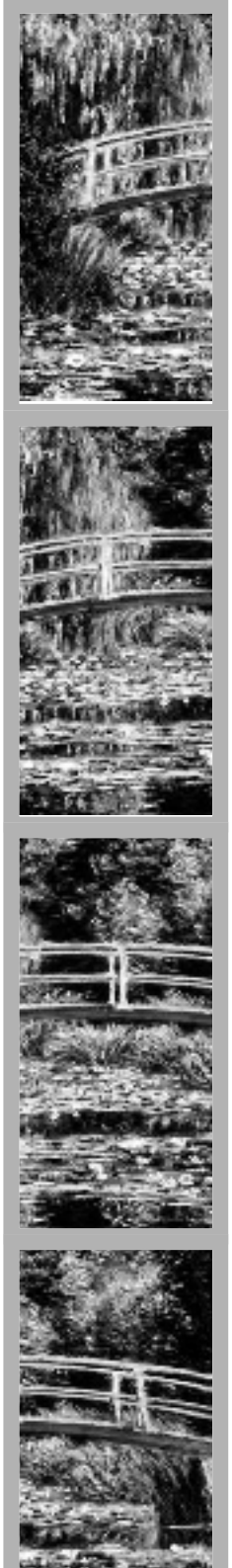
Autoria



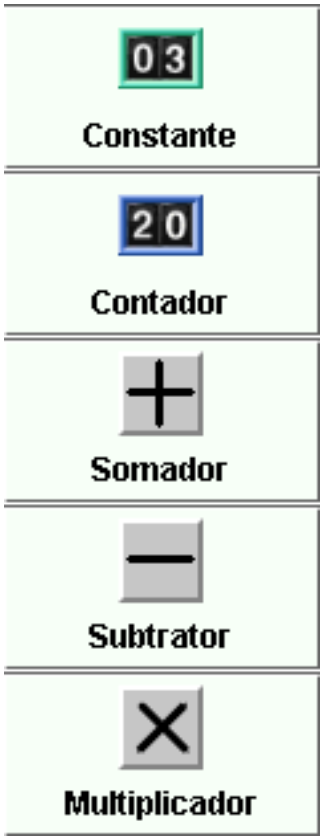
Conteúdo Objetos



Composição de Objetos

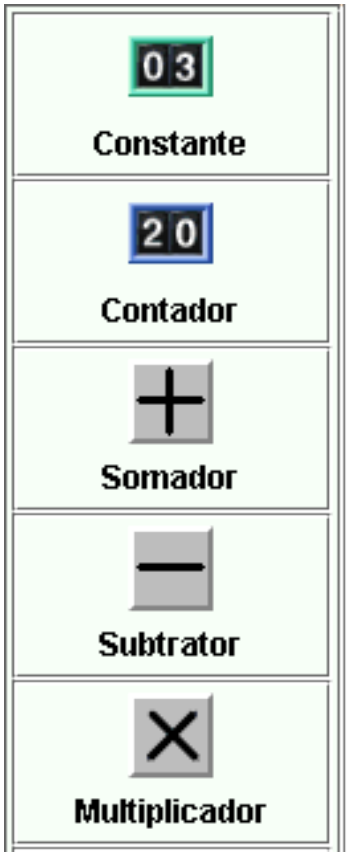


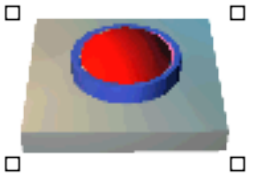
Composição

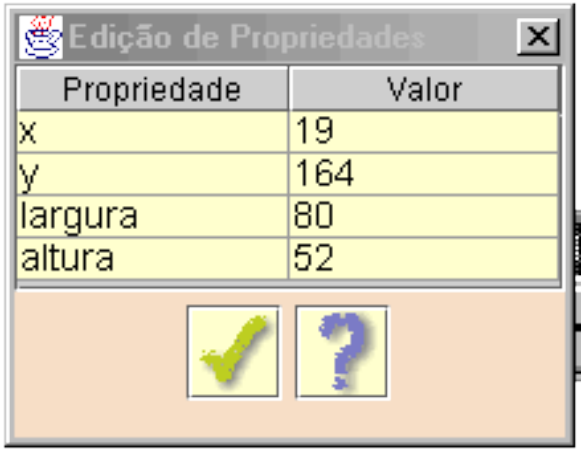


Em uma ferramenta de produção, como o Casa Mágica, o autor dispõe de uma barra de componentes para elaborar sua composição. Estes componentes são baseados em classes de objetos.

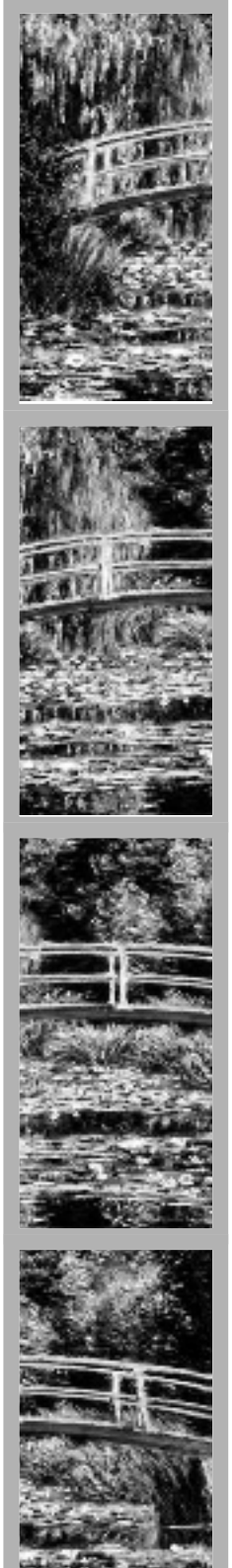
Composição



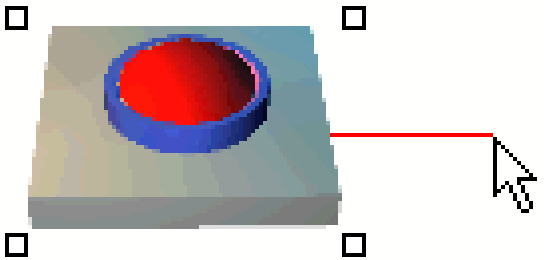


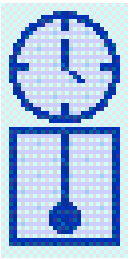


Ele seleciona os componentes e os configura conforme sua necessidade.

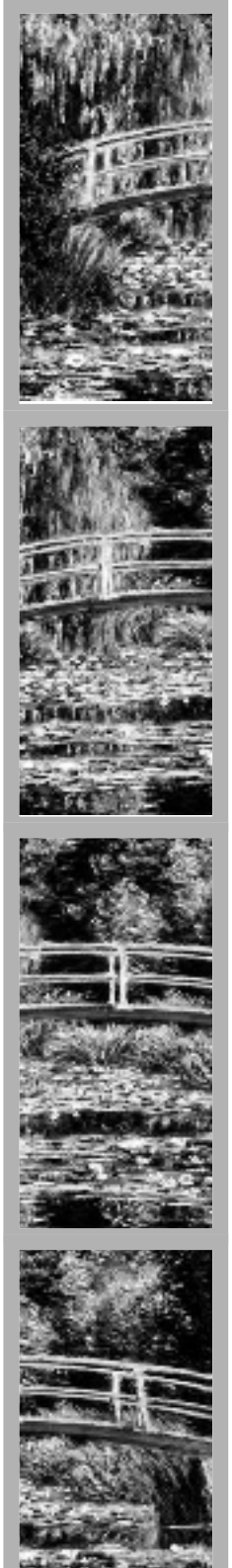


Composição

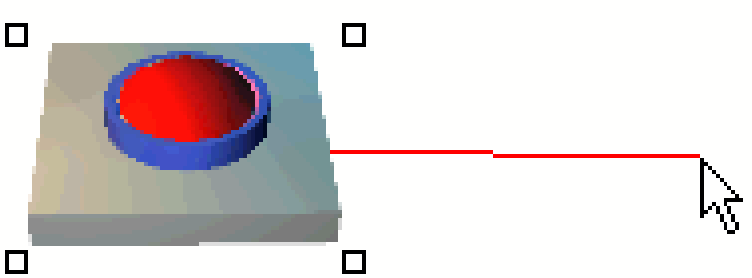


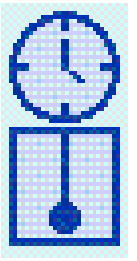


Os componentes são interligados.

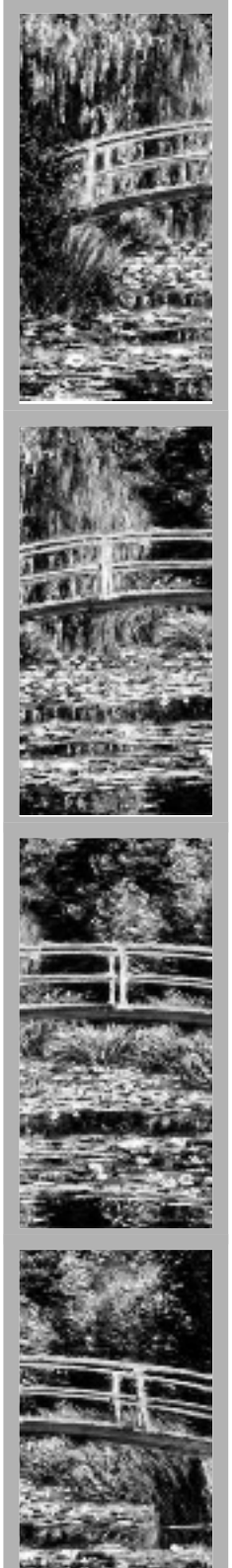


Composição

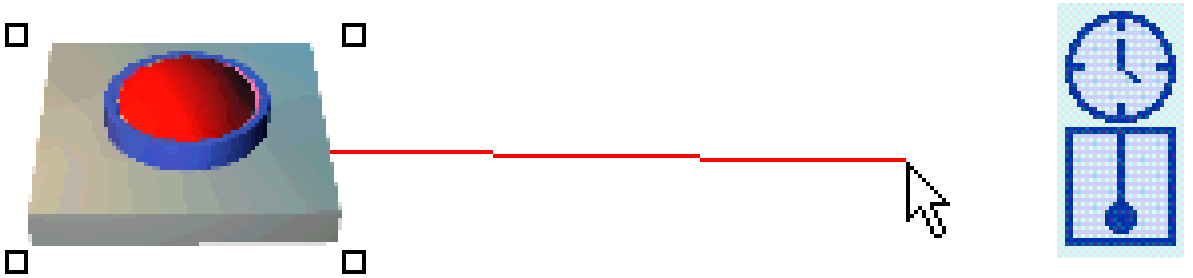




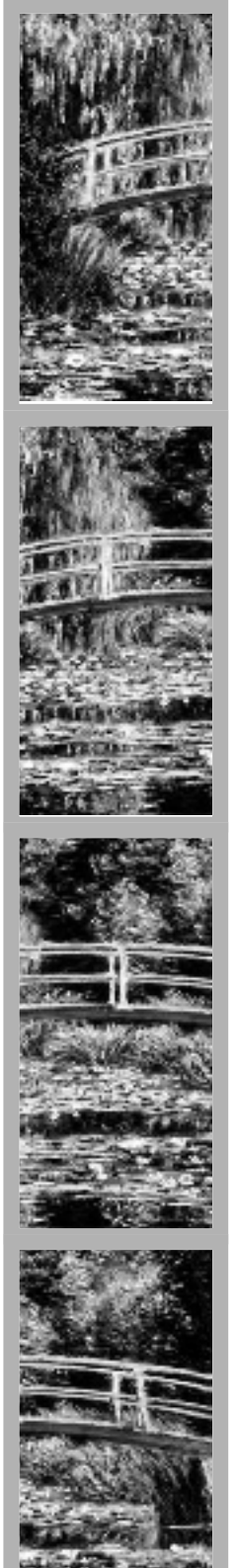
Os componentes são interligados.



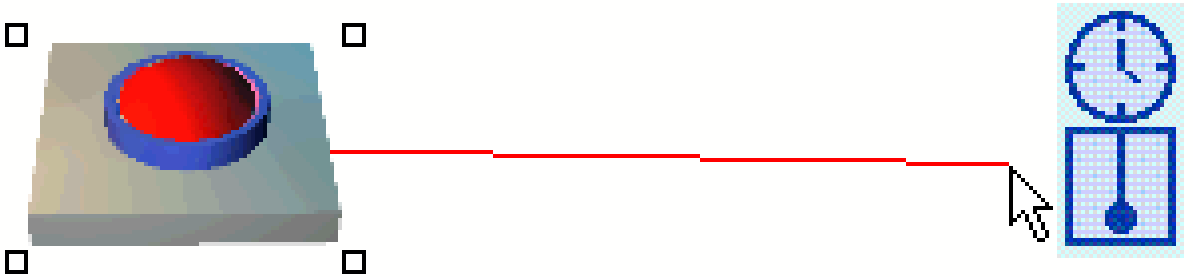
Composição



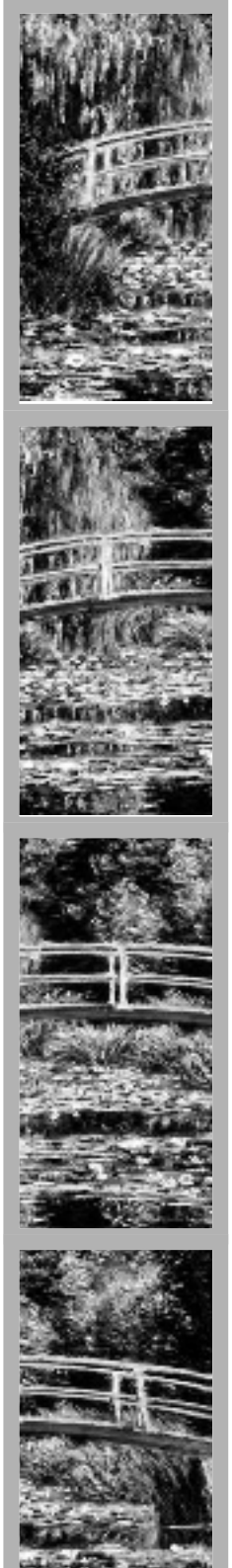
Os componentes são interligados.



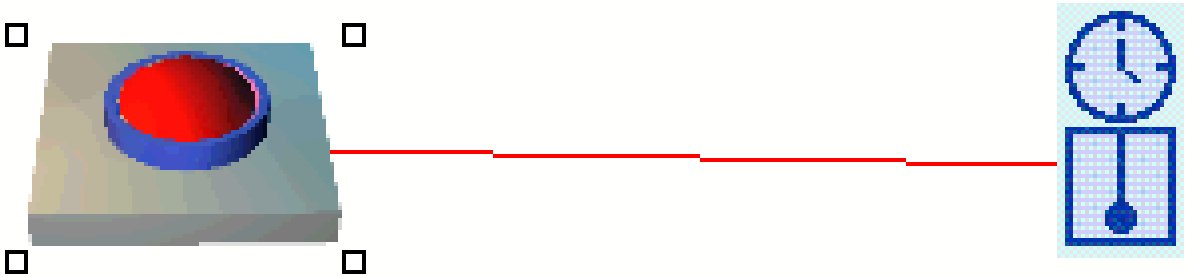
Composição



Os componentes são interligados.

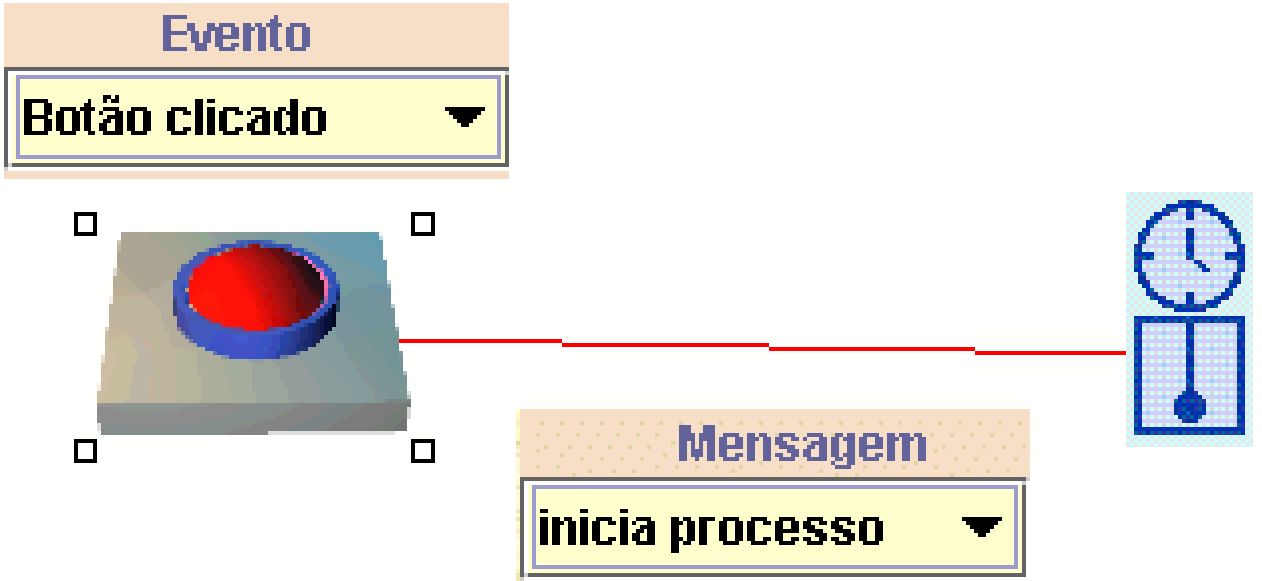


Composição

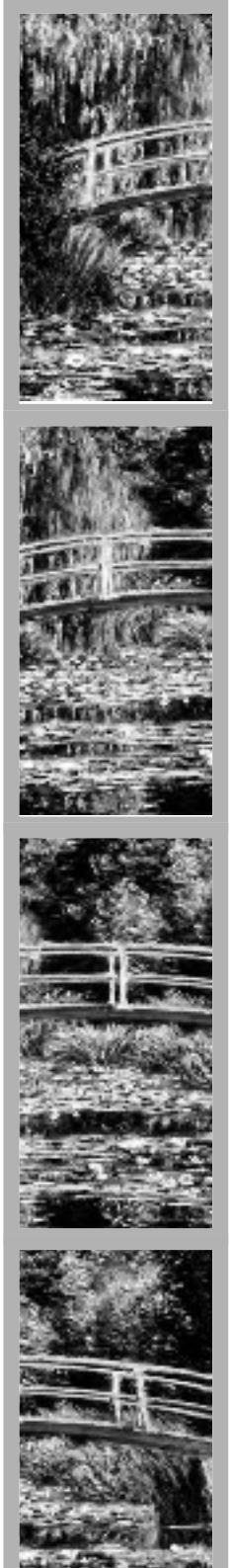


Os componentes são interligados.

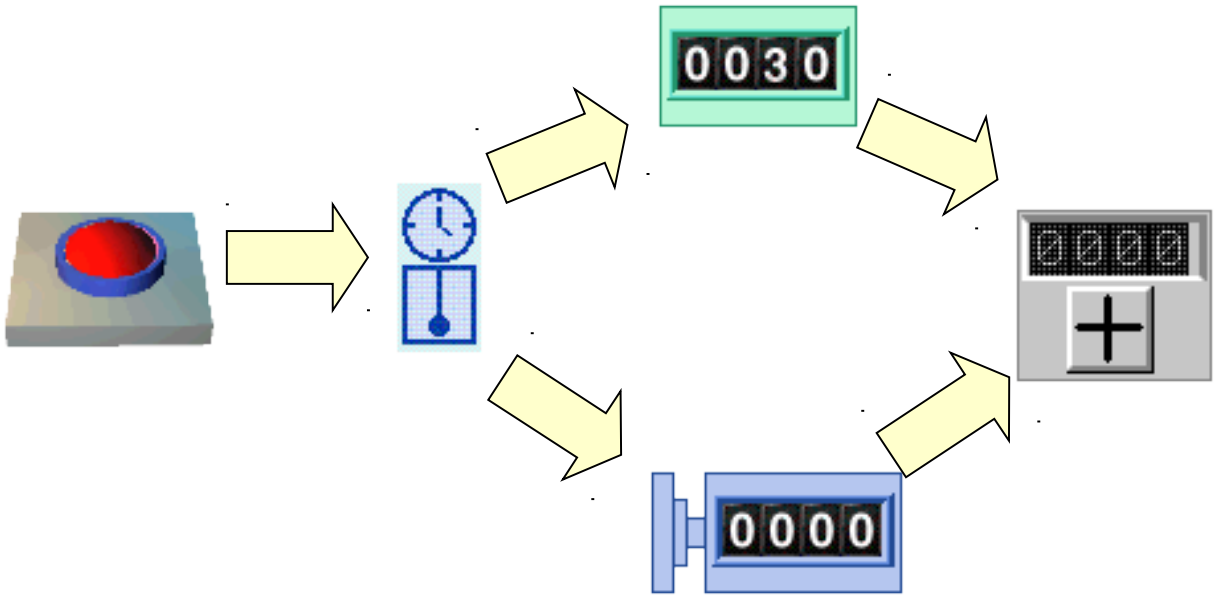
Composição



O autor seleciona o evento que dispara o processo e a mensagem que será enviada de um objeto a outro.



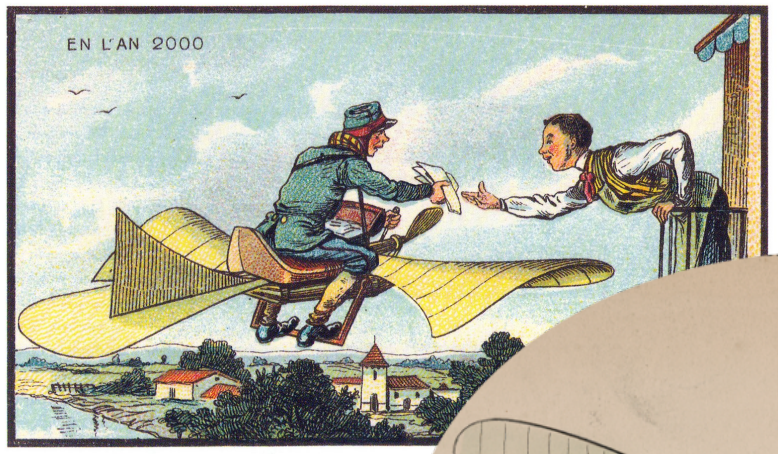
Composição



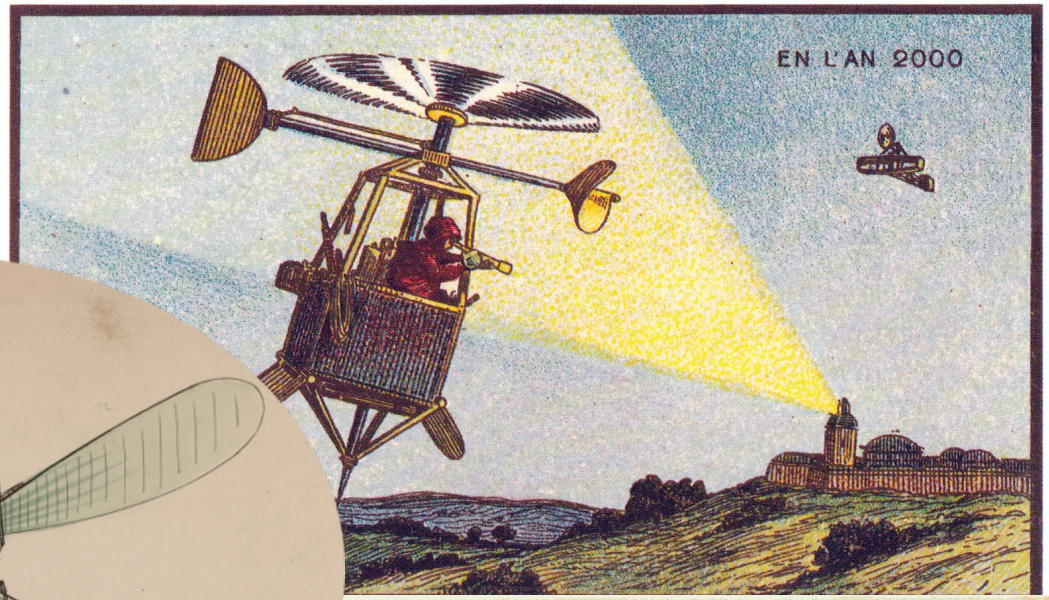
A aplicação que resulta da rede de interligações entre os objetos é a composição.

Composing Everything

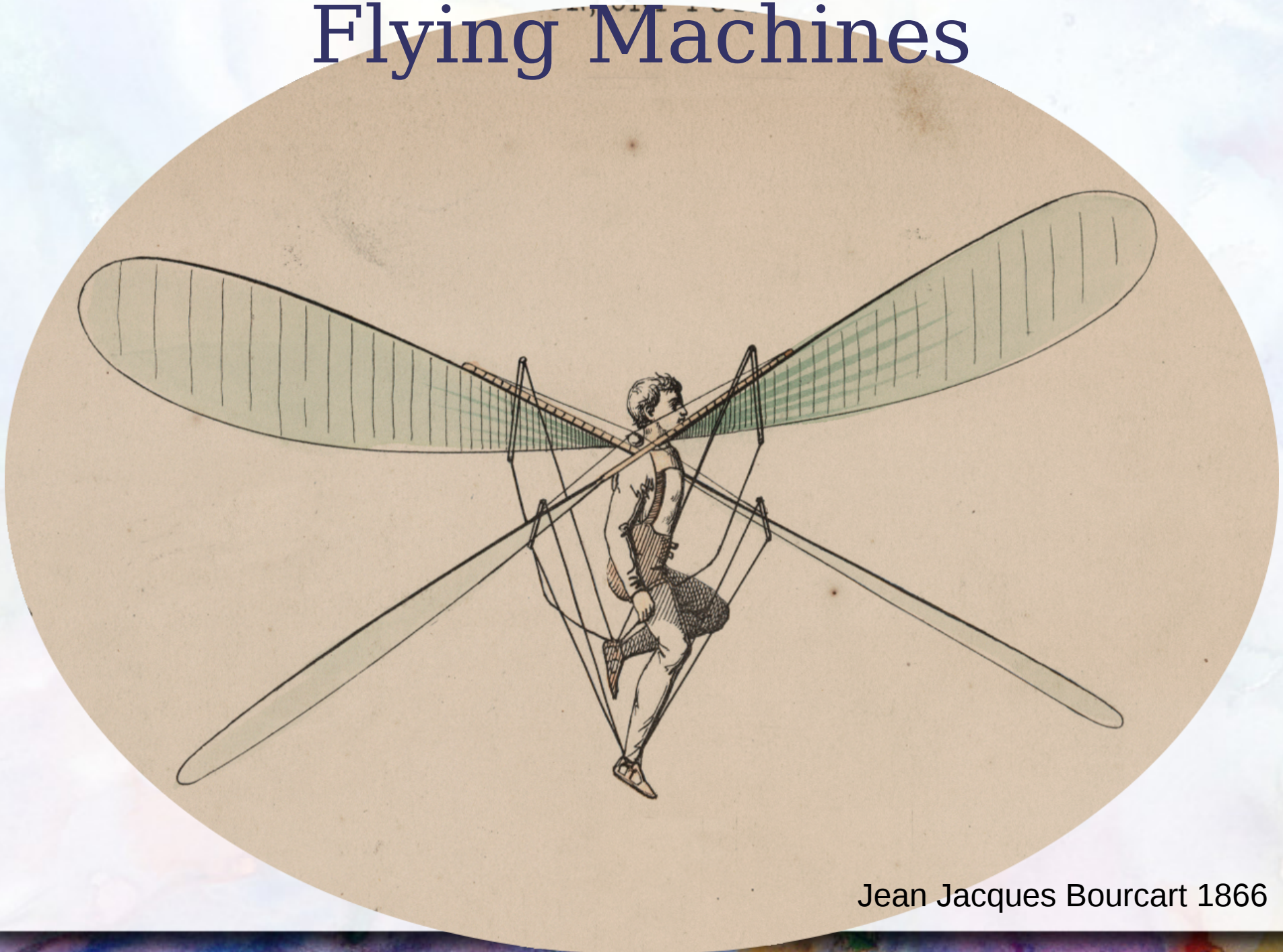
Flying Machines



The Rural Postman

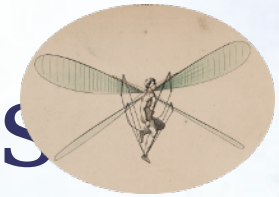


Flying Machines



Jean Jacques Bourcart 1866

Flying Machines



Pequenos Autores

- “[...] as coisas pequenas caem dentro das fendas.” (Koning-Bastiaan)

Traduzido do original em inglês: “[...] the small stuff falls through the cracks.” (Koning-Bastiaan)

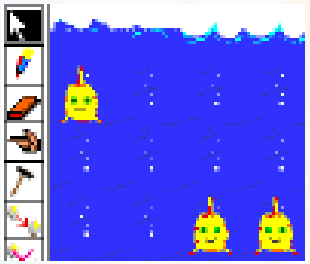
Dream of Composing Everything

ESCOT

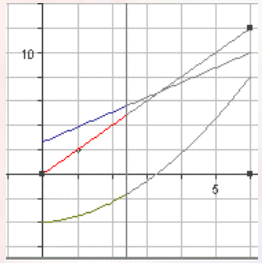
- ESCOT – *Educational Software Components of Tomorrow* (http://www.escot.org/)
  - proposta para integração e reuso de *software* educacional baseada em componentes;
  - integra diversas ferramentas educacionais;
  - linguagem padrão – Java;
  - define protocolo padrão para comunicação entre os componentes.

ESCOT

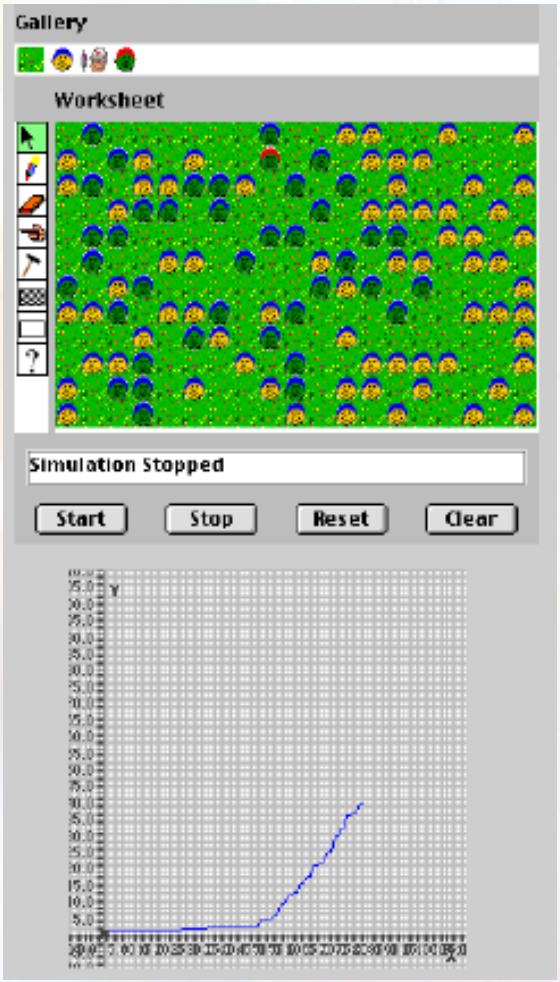
AgentSheets



MathWorlds



E-Slate



ESCOT

- “No futuro, as idéias para atividades educacionais específicas vão converter-se em software tão fácil quanto a escrita de um documento: O processo de desenvolvimento será substituído por um processo de edição, criação e manipulação de ‘aplicações editáveis’. Estas aplicações consistirão em objetos computacionais de alto nível, disponíveis como blocos tangíveis de construção.” [Roschelle et al. 1999]

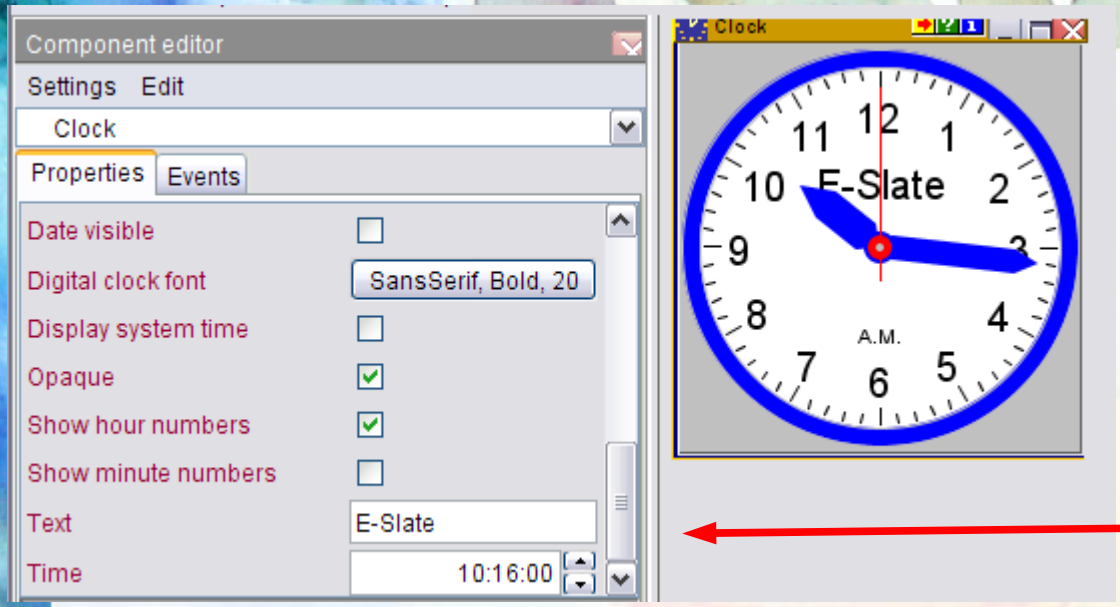
E-Slate

- O E-Slate é um ambiente para a construção de micromundos por meio da combinação de componentes de software.

(versão antiga do E-Slate)

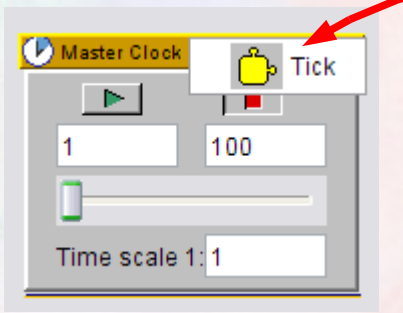
E-Slate

Inserção e configuração de componentes

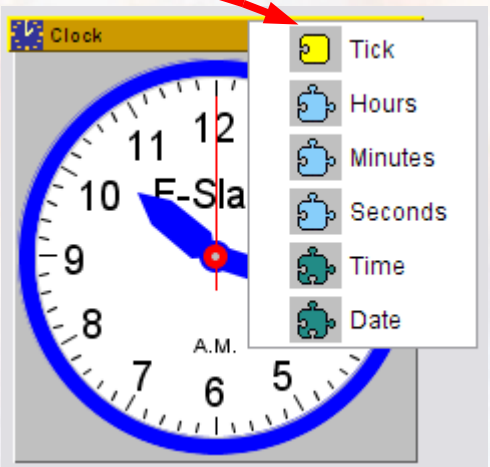


painel de configuração

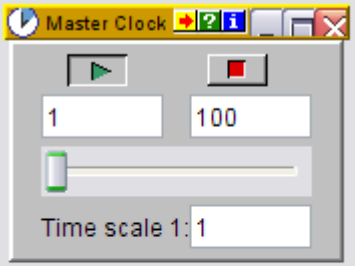
conexões compatíveis



componente Master Clock



componente Clock



Composição final

(a cada pulso do Master Clock o Clock incrementa o horário)

Ligação entre componentes

E-Slate

- Os componentes podem ser diretamente combinados em páginas Web e seu comportamento pode ser descrito através de uma linguagem de script baseada no LOGO.

Componente Mapa com agente

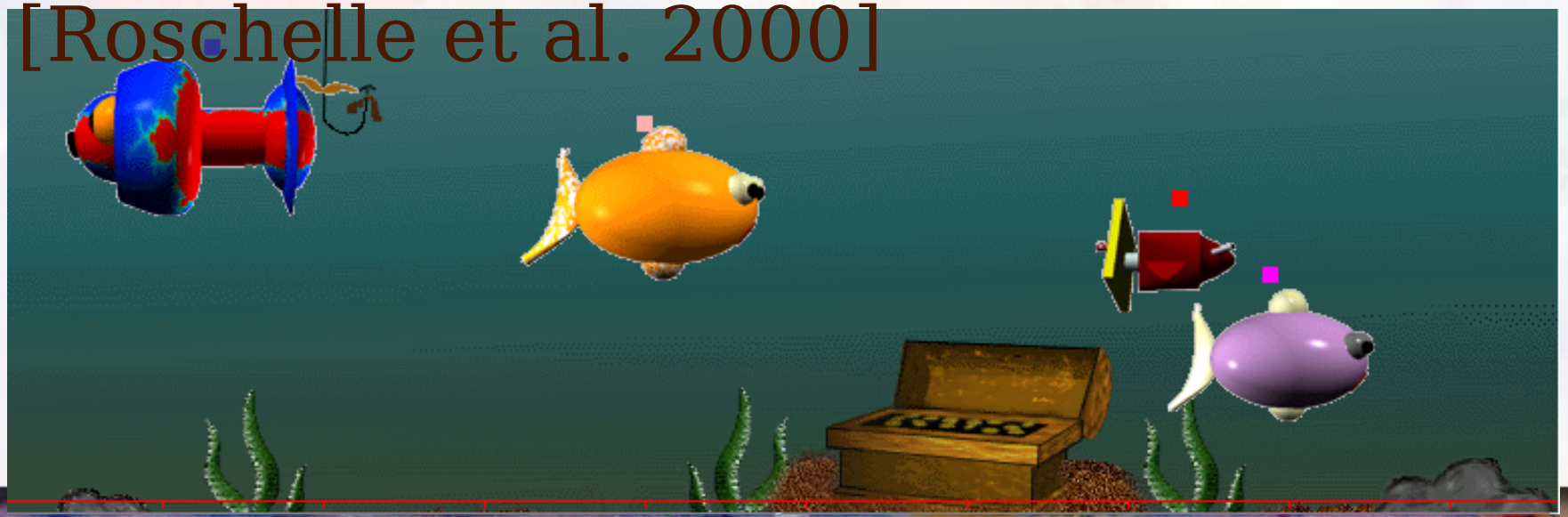
Linguagem baseada no LOGO move agente

Componente Agente

(versão antiga do E-Slate)

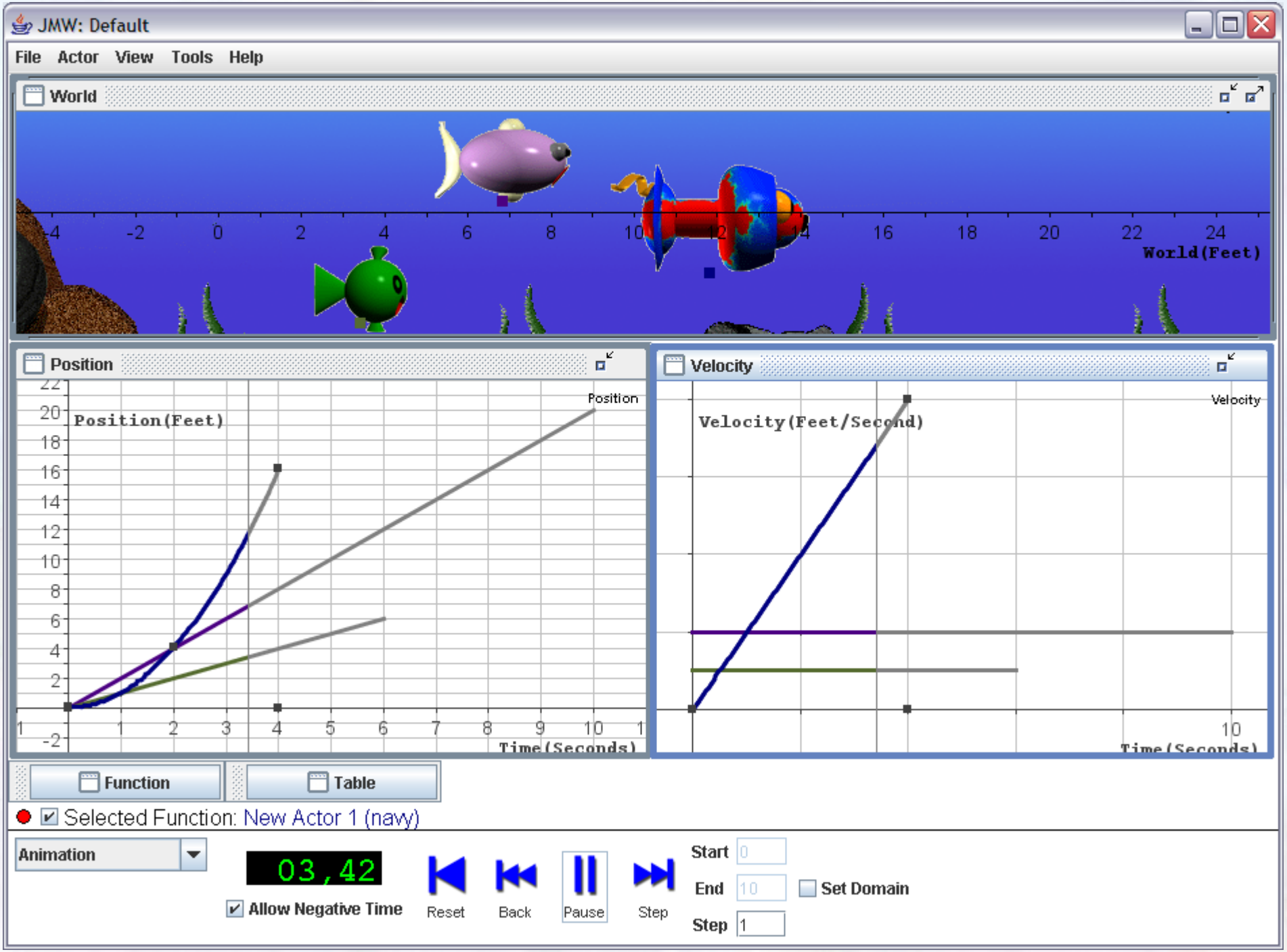
SimCalc e MathWorlds

- “[...] provê uma coleção de componentes de software, incluindo um conjunto de mundos de animação e uma variedade de gráficos. Os atores nos mundos (como um palhaço, ou um pato) movem-se de acordo com funções matemáticas.” [Roschelle et al. 2000]



SimCalc e MathWorlds

- “Os gráficos mostram essas funções matemáticas e permitem aos alunos editarem diretamente as funções.” [Roschelle et al. 2000]


JMW: Default
File Actor View Tools Help
World
-4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24
World(Feet)
Position
Position(Feet)
Position
Time(Seconds)
Velocity
Velocity(Feet/Second)
Velocity
Time(Seconds)
Function
Table
Selected Function: New Actor 1 (navy)
Animation
03,42
Allow Negative Time
Reset
Back
Pause
Step
Start 0
End 10
Set Domain
Step 1

SimCalc e MathWorlds

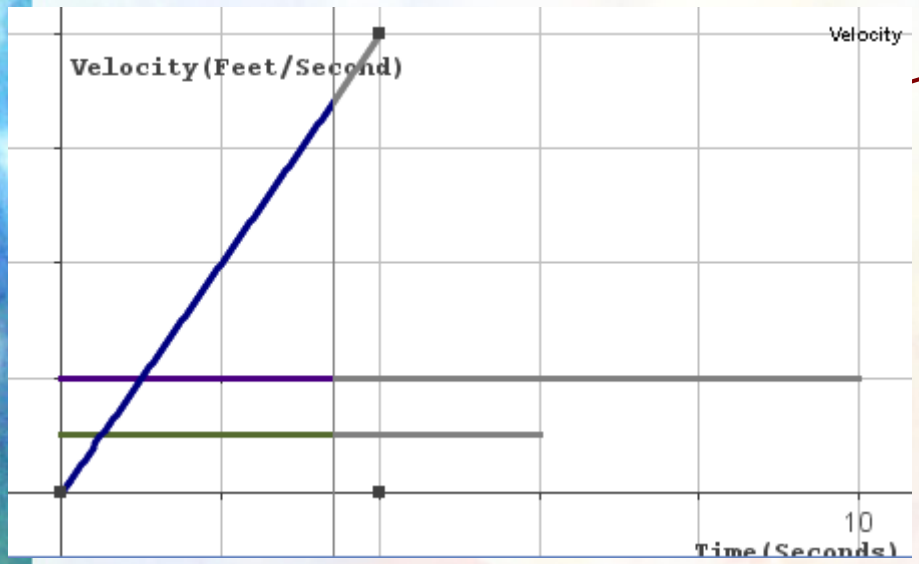


Gráfico
Velocidade x Tempo

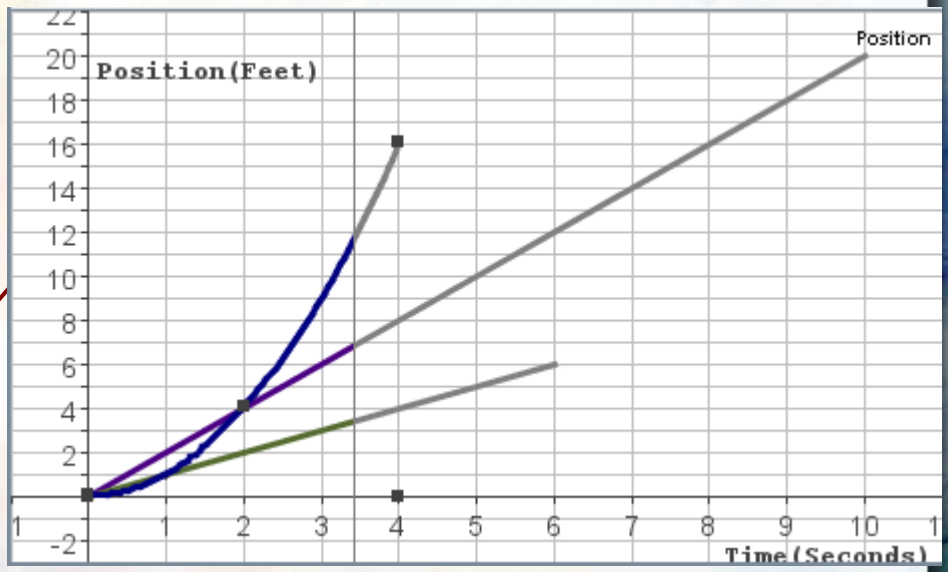
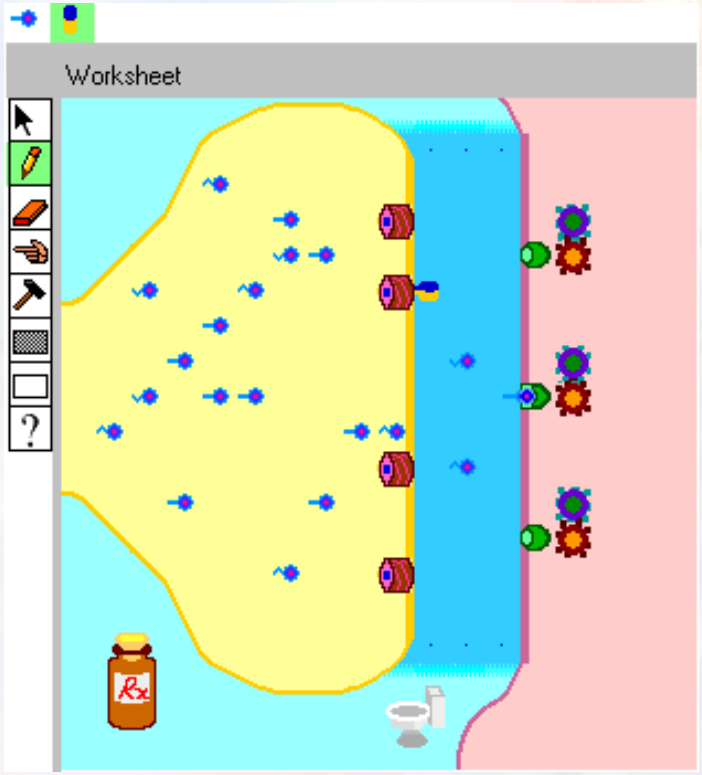


Gráfico
Distância x Tempo

Atores animados (deslocamento conforme o gráfico)

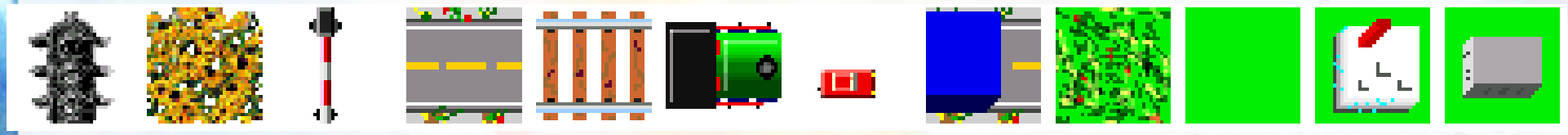
AgentSheets

“AgentSheets é um ambiente de autoria baseado em agentes destinado a educadores para construir simulações que podem se transformar em applets Java e JavaBeans”. [ROS99]

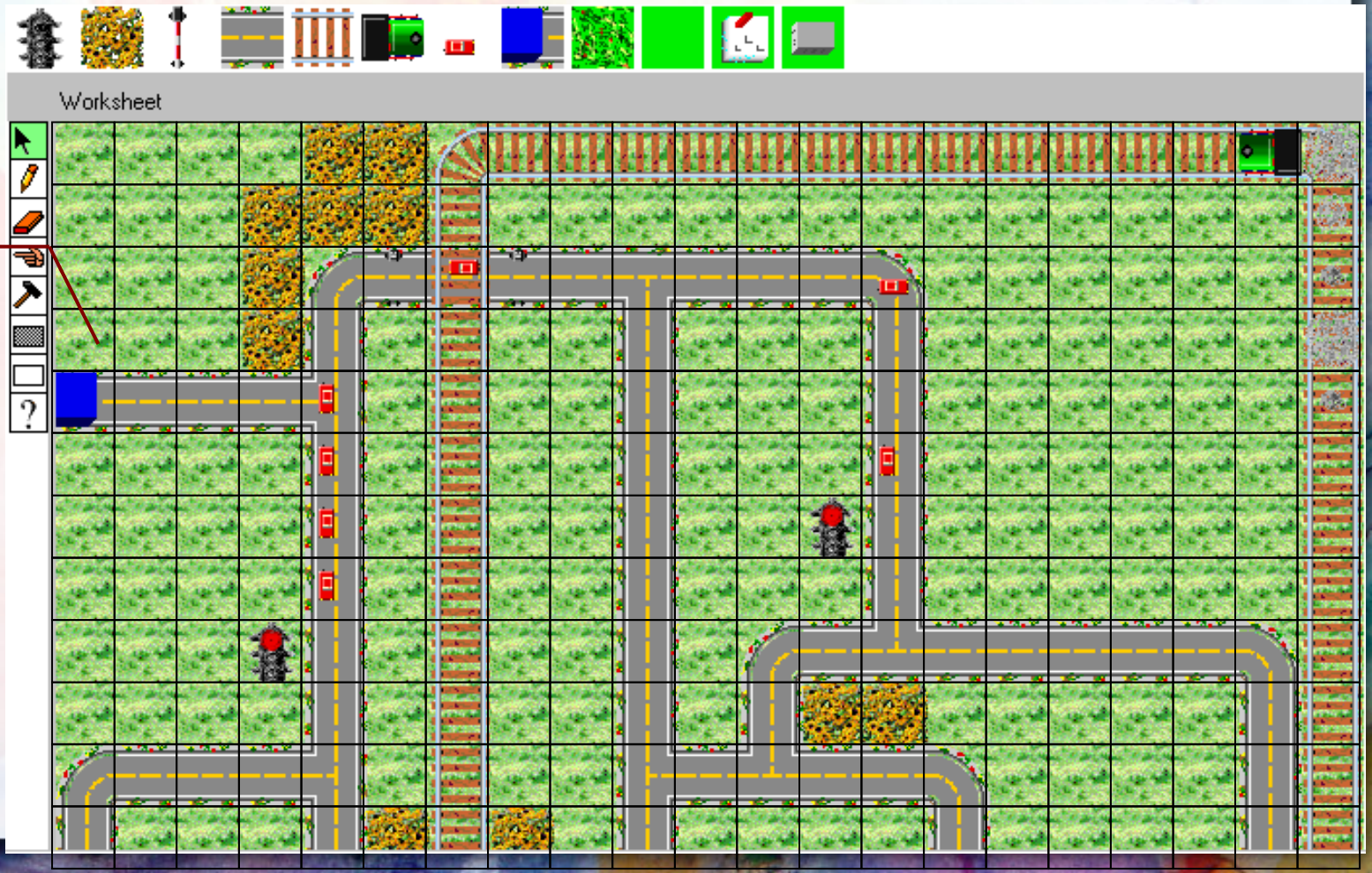


AgentSheets

Agentes



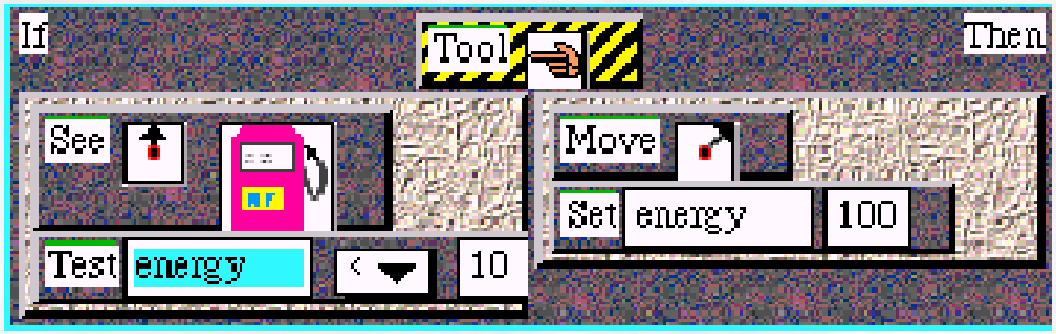
Espaço Discreto

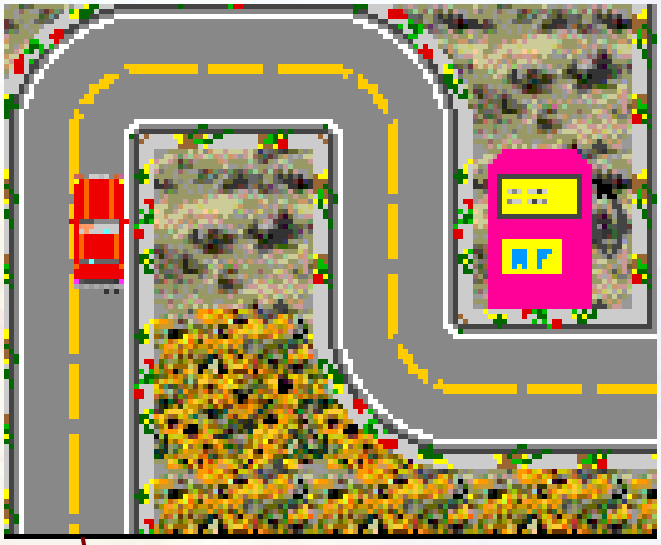


AgentSheets

Visual AgentTalk

Comportamento



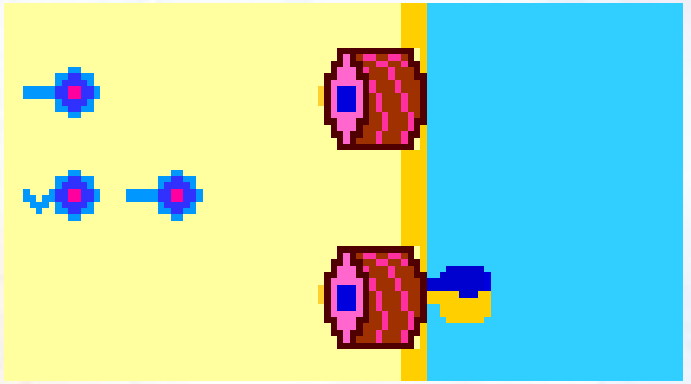


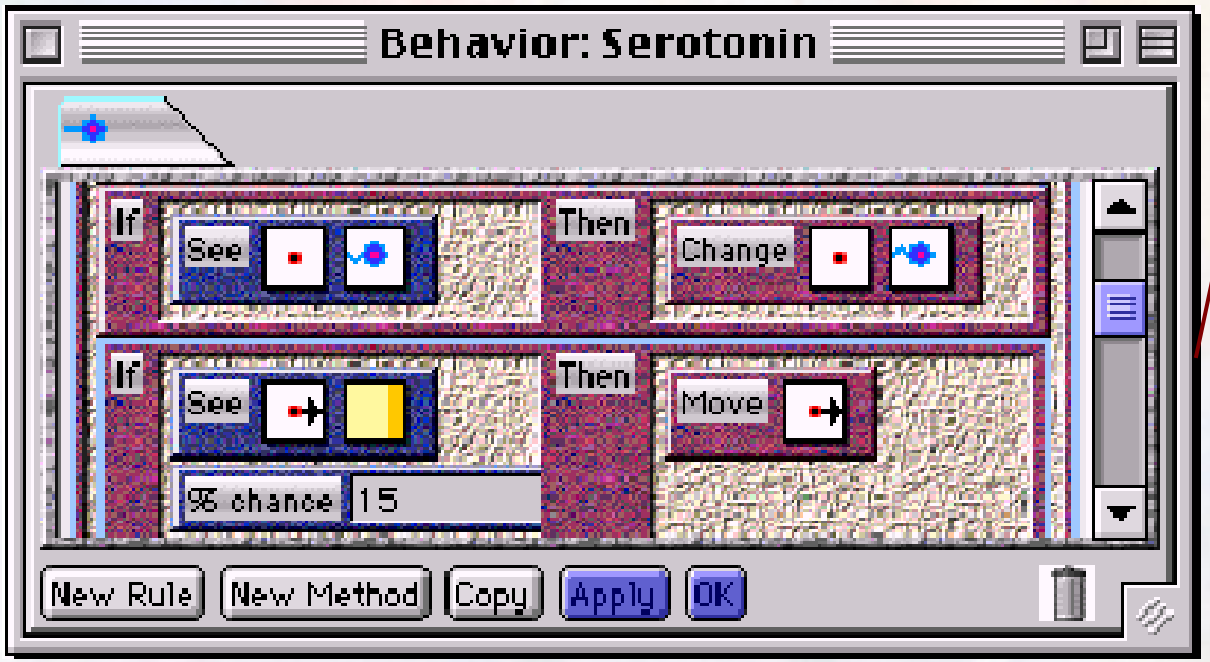
Agentes e Simulação

AgentSheets

Visual AgentTalk

Agentes e Simulação

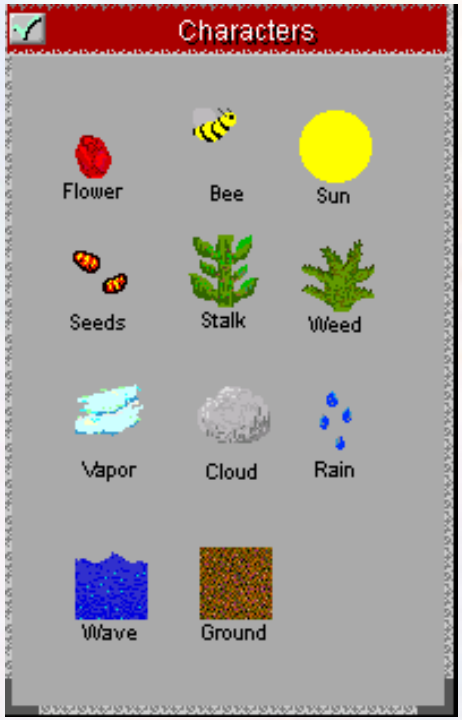




Comportamento

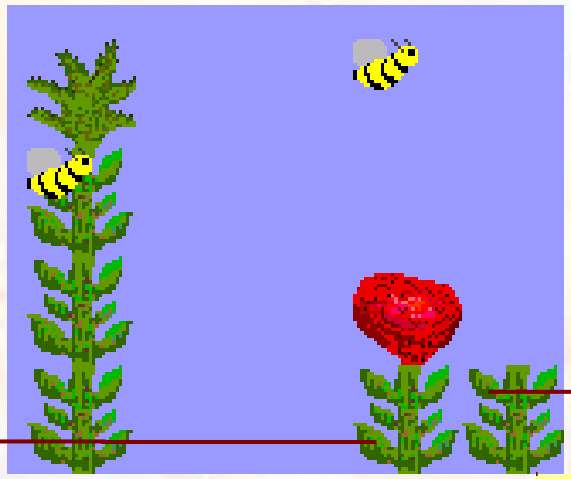
StageCast

Baseados em agentes cuja atuação se desenvolve em espaço e tempo discretos. Sua abordagem é especialmente adequada para a realização de atividades pedagógicas que usam simulação.

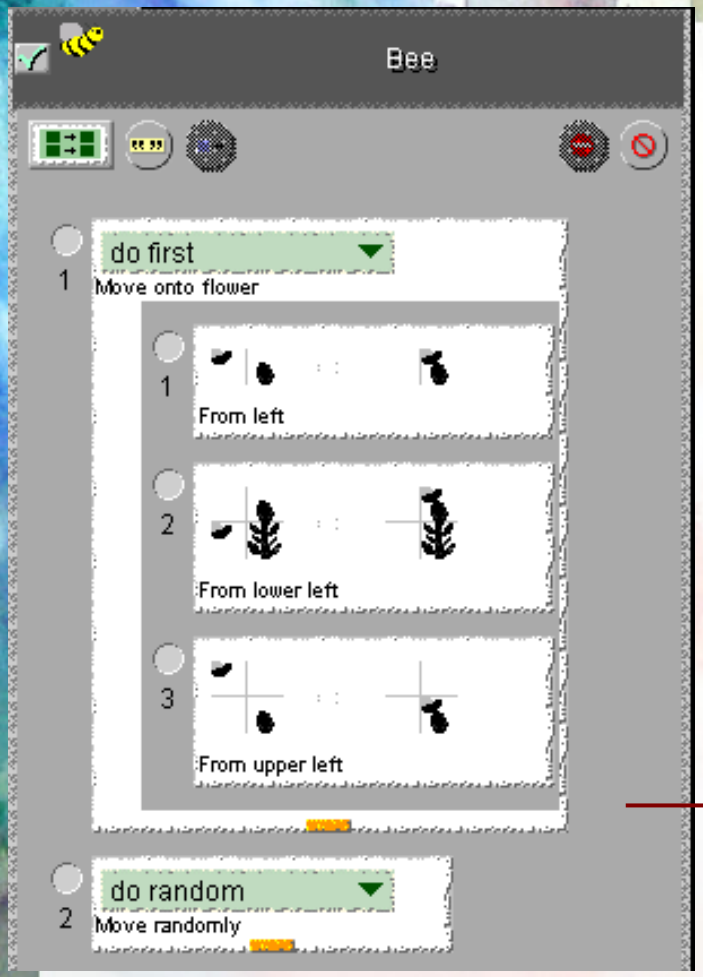


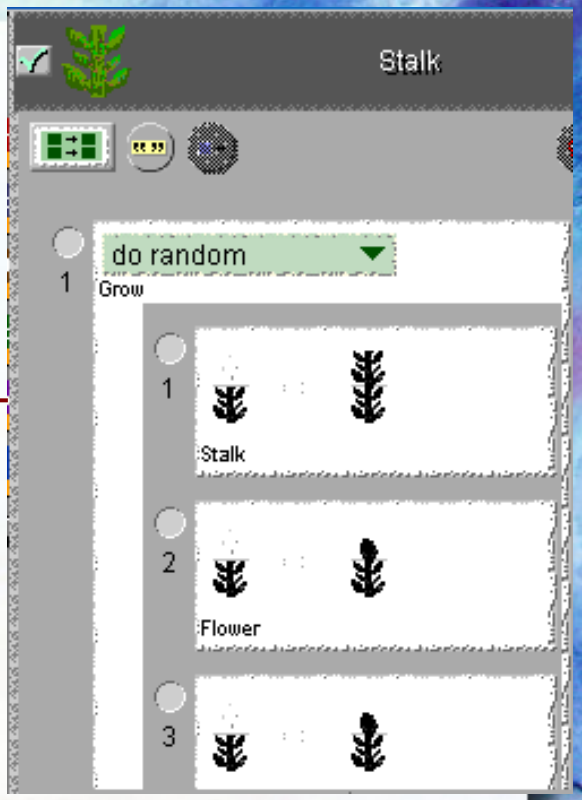
StageCast

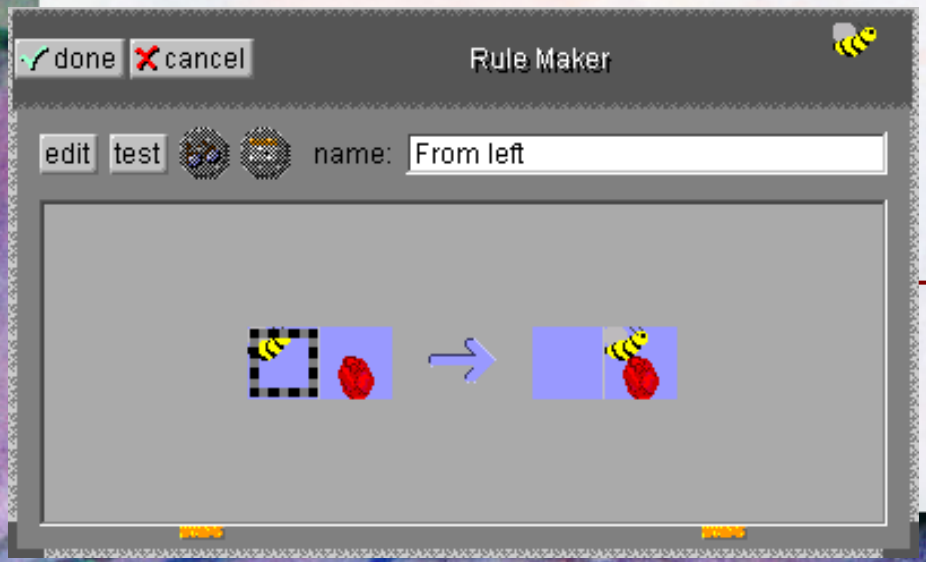
Agentes e Simulação

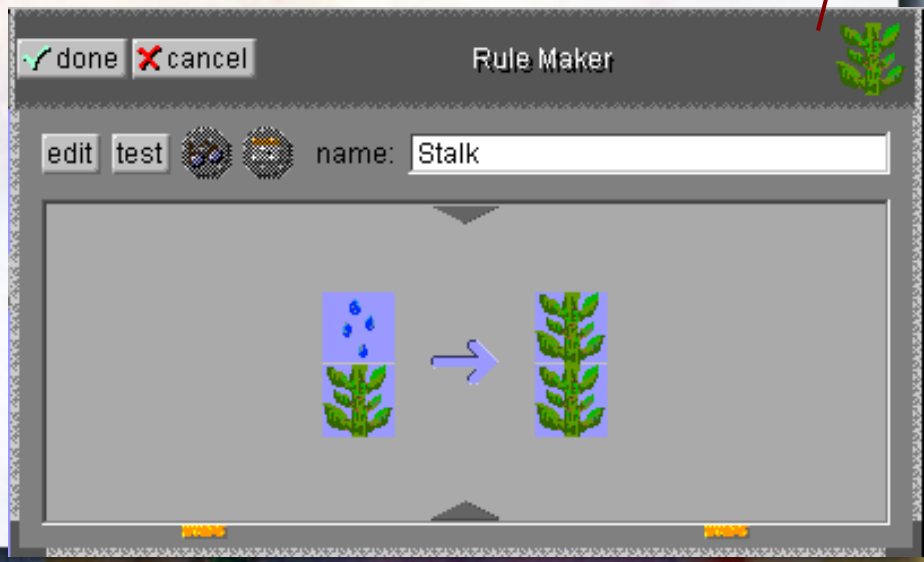


Comportamento

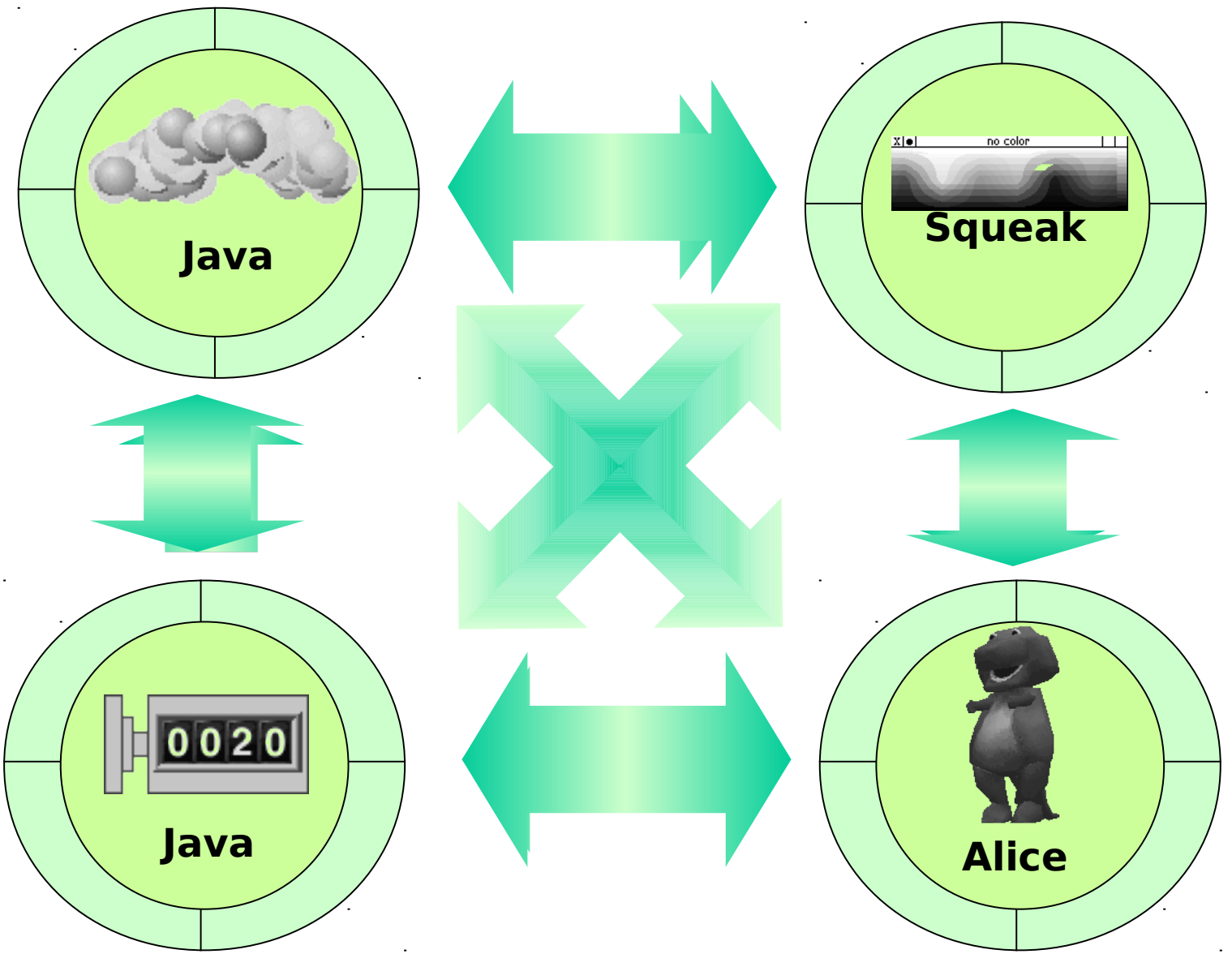








Anima e Integração

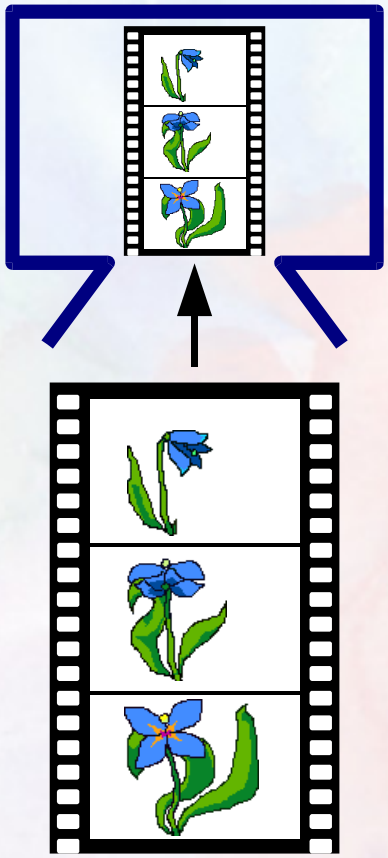


Composing Everything
Magic House

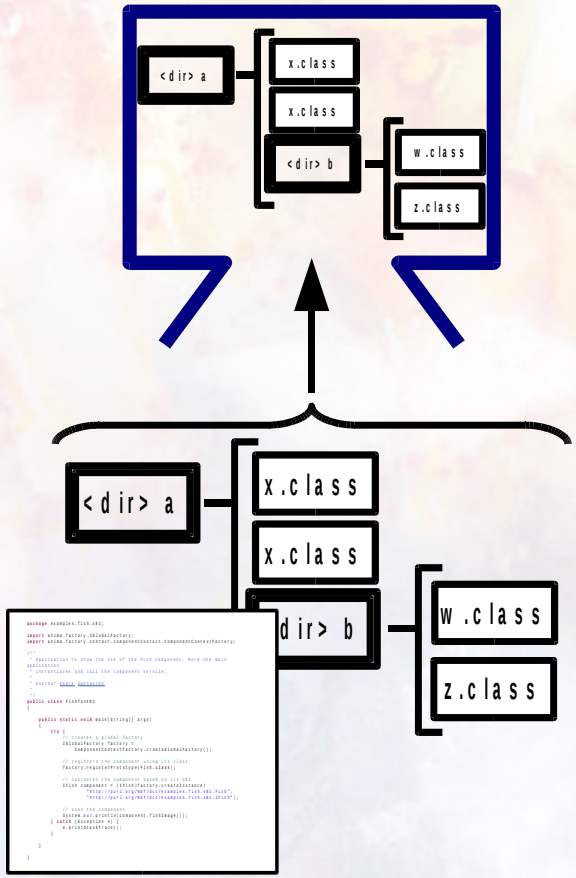
CDO Perspective

Formed by

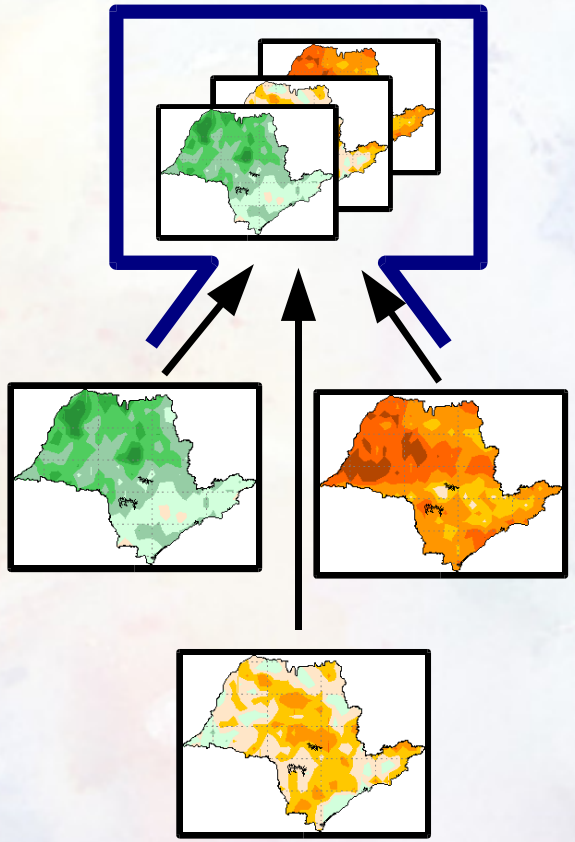
- Heterogeneous artifacts



Video



Executable Code



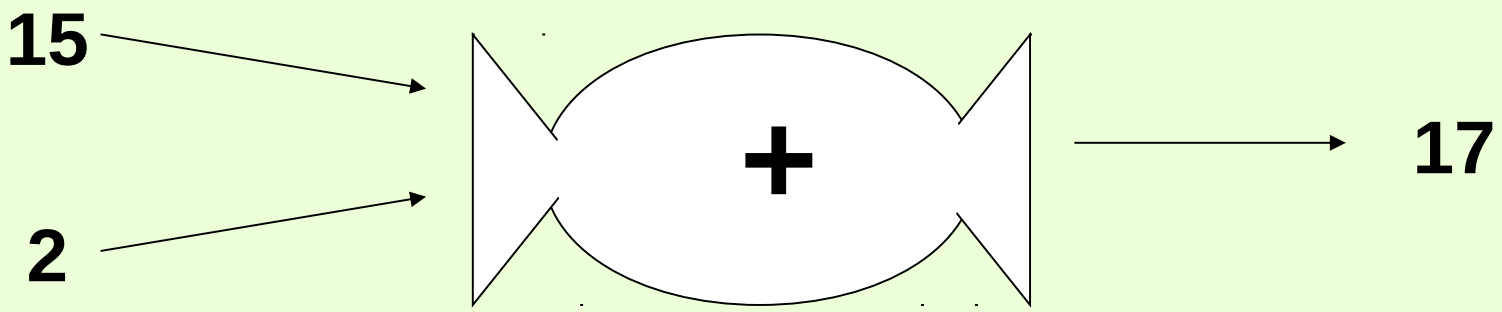
Maps

Projeto com Casa Mágica

- Componentes de *software* que simulam máquinas para o ensino de matemática.

Metáfora das Máquinas

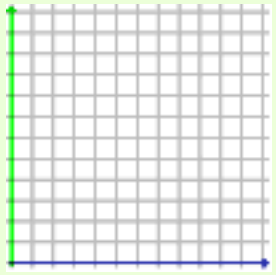
Utilizada para a explicação das quatro operações básicas.



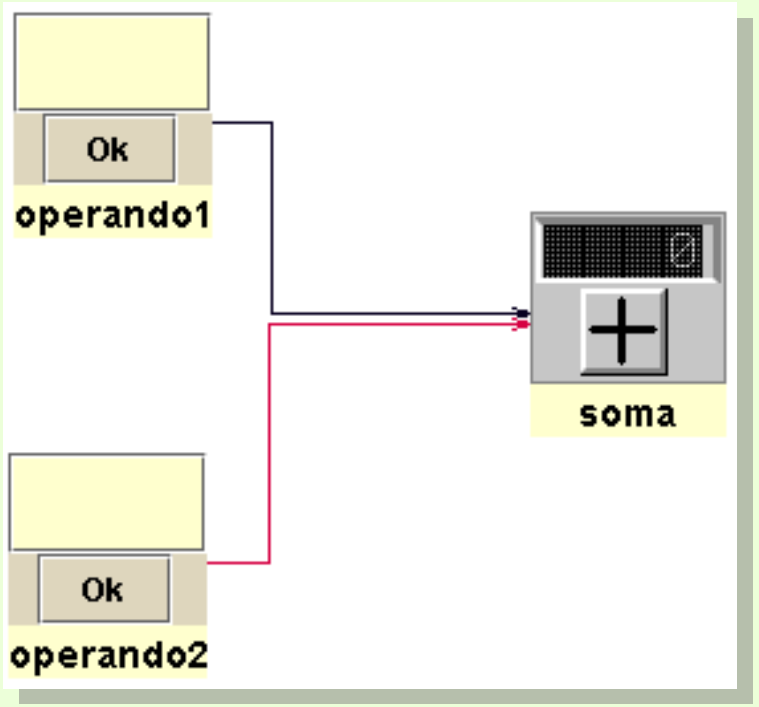
Proposta

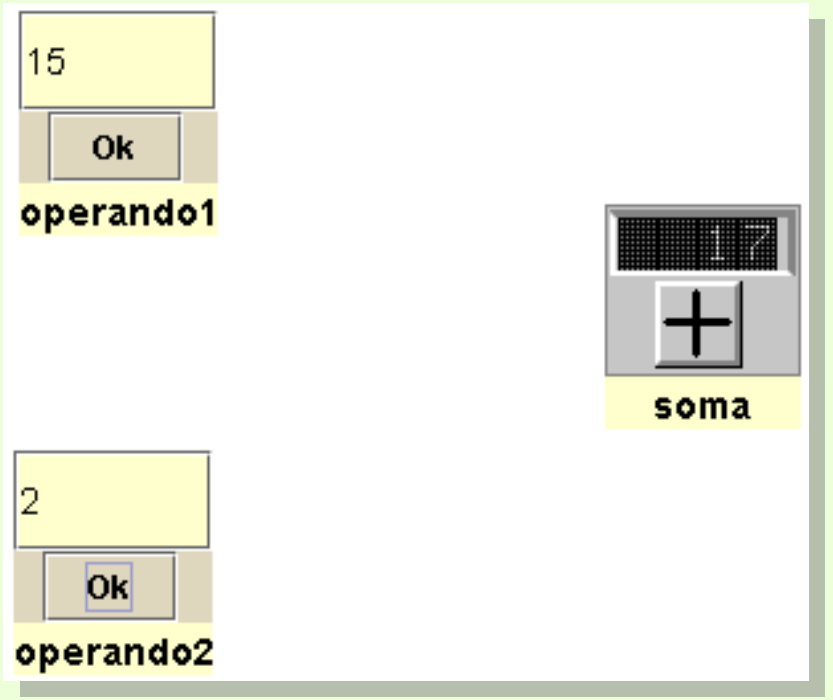
O computador, tomado como máquina genérica, é capaz de simular virtualmente estas máquinas matemáticas, cujo comportamento se pretende estudar.

Máquinas elementares podem ser convertidas em componentes de *software*.



Casa Mágica

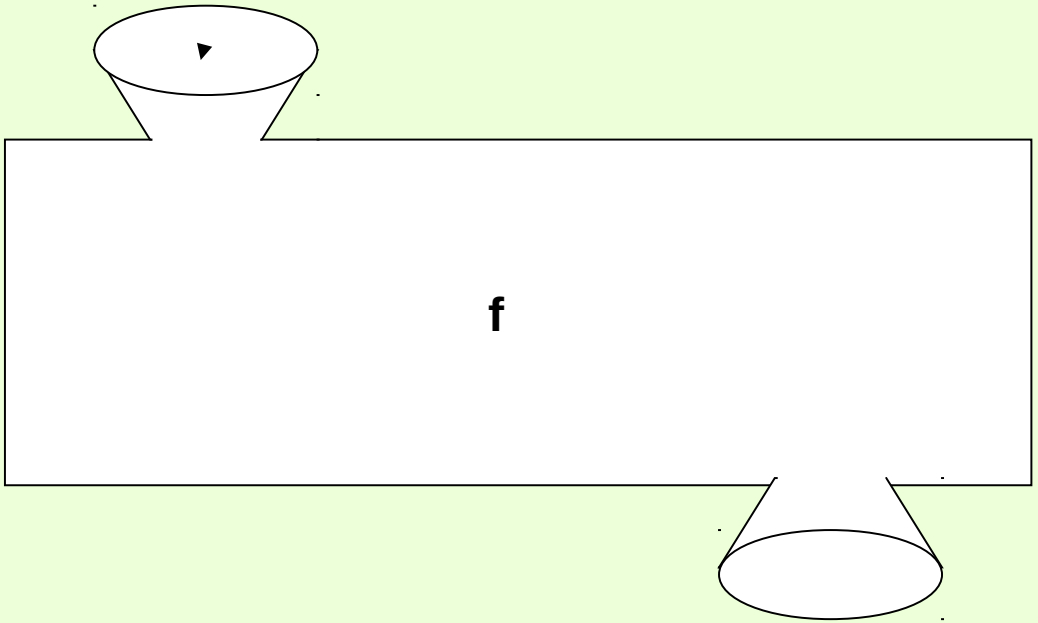

Ok
operando1
0
soma
Ok
operando2


15
Ok
operando1
17
soma
2
Ok
operando2

Metáfora das Máquinas

Utilizada para a explicação de funções.

entrada **x**



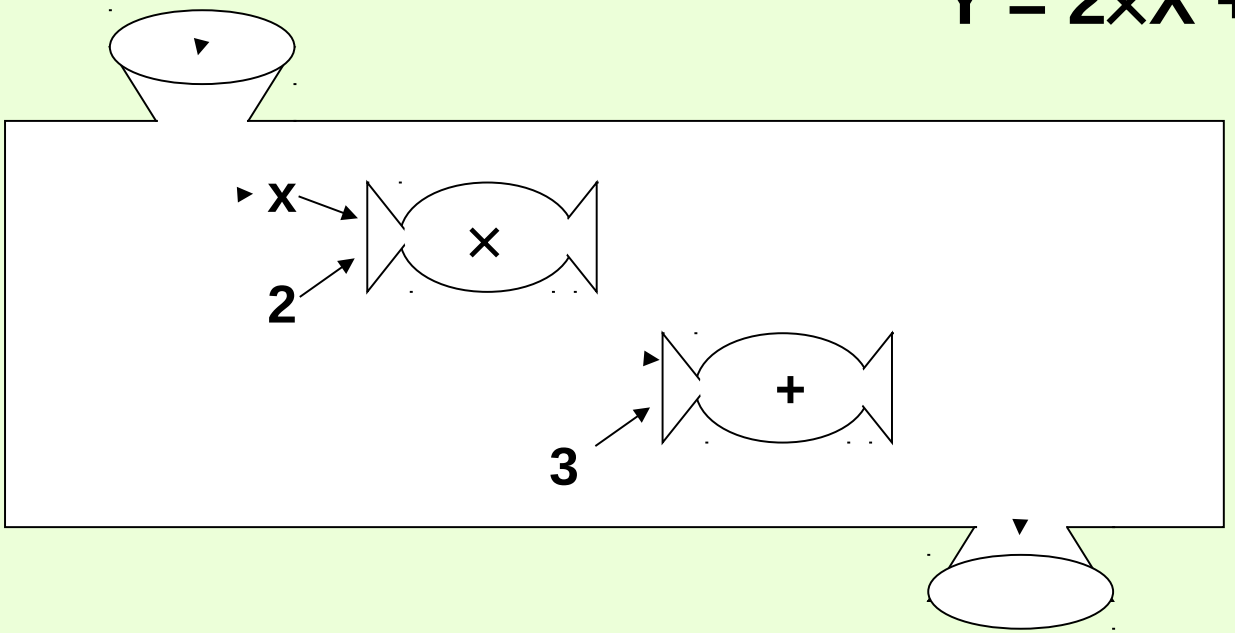
- saída **y = f(x)**

Proposta

Interligar máquinas de menor complexidade para compor máquinas funções.

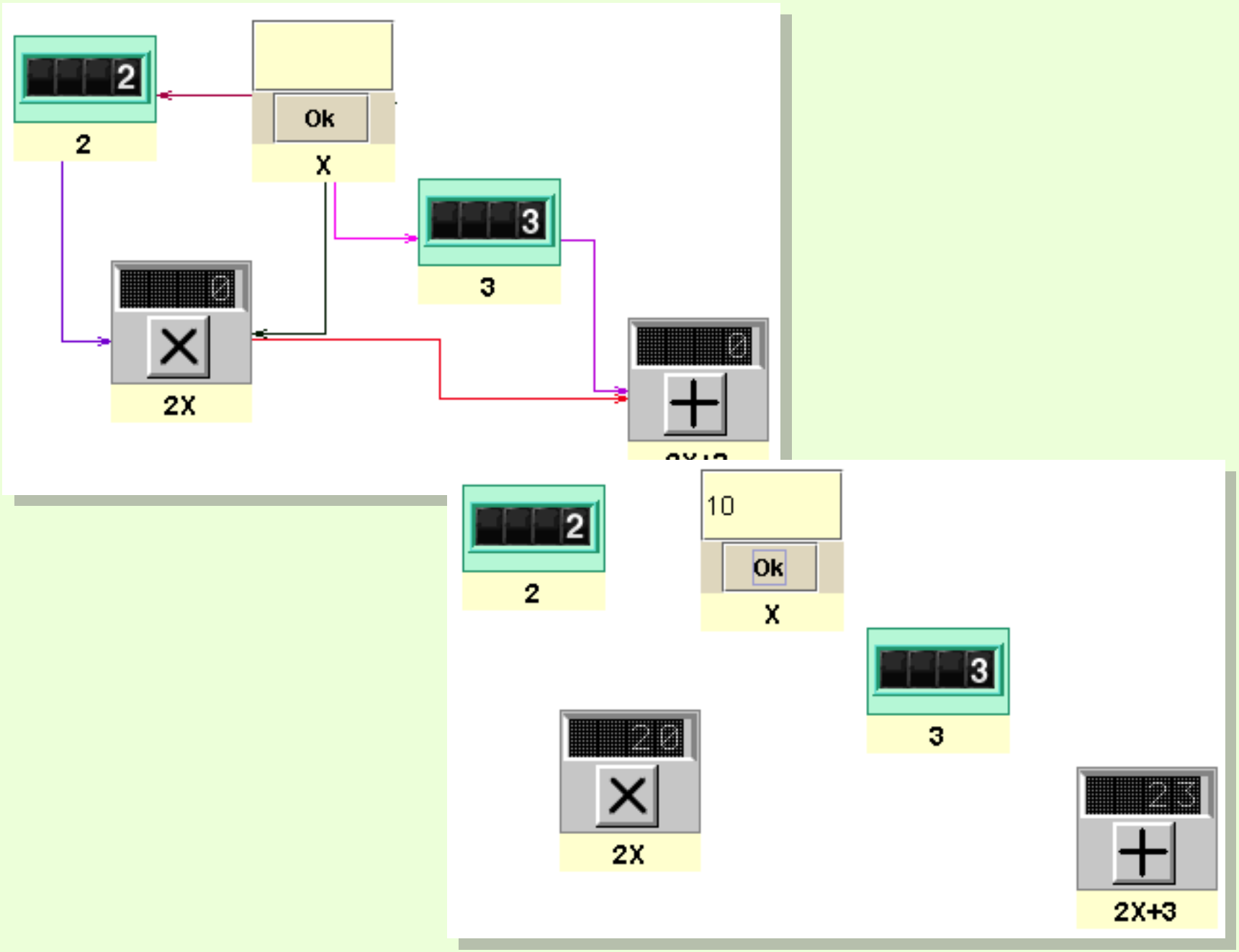
entrada **x**

Y = 2×X + 3

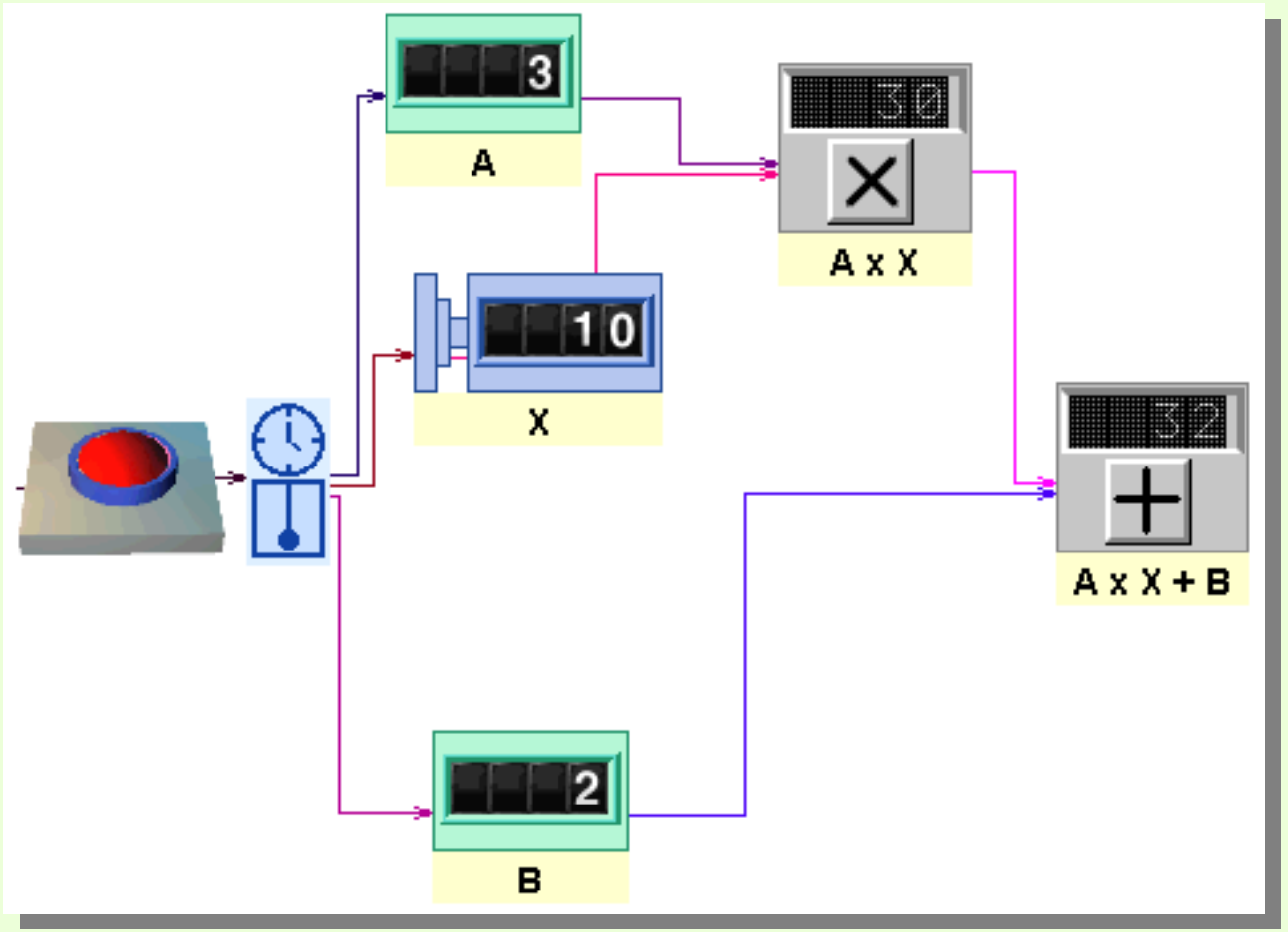


saída **y = f(x)**

Casa Mágica

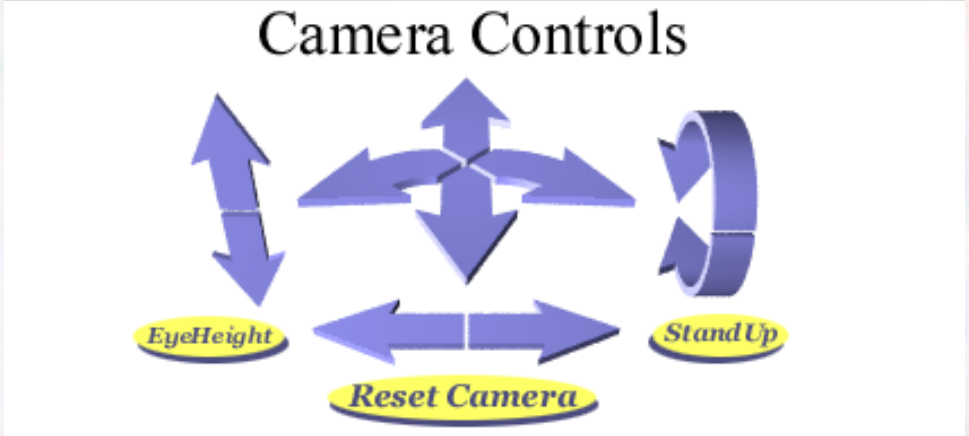


Casa Mágica



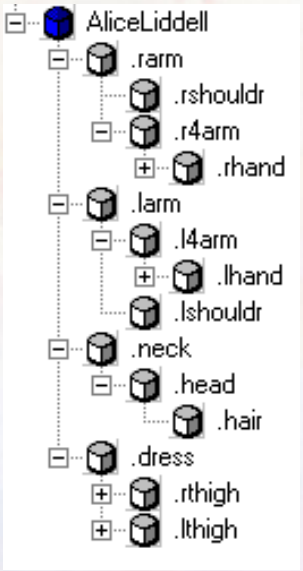
Espaço 3D

Alice



Ambiente tridimensional para a construção de animações com propósitos educacionais.

Utiliza a Tecnologia de Objetos.



Alice

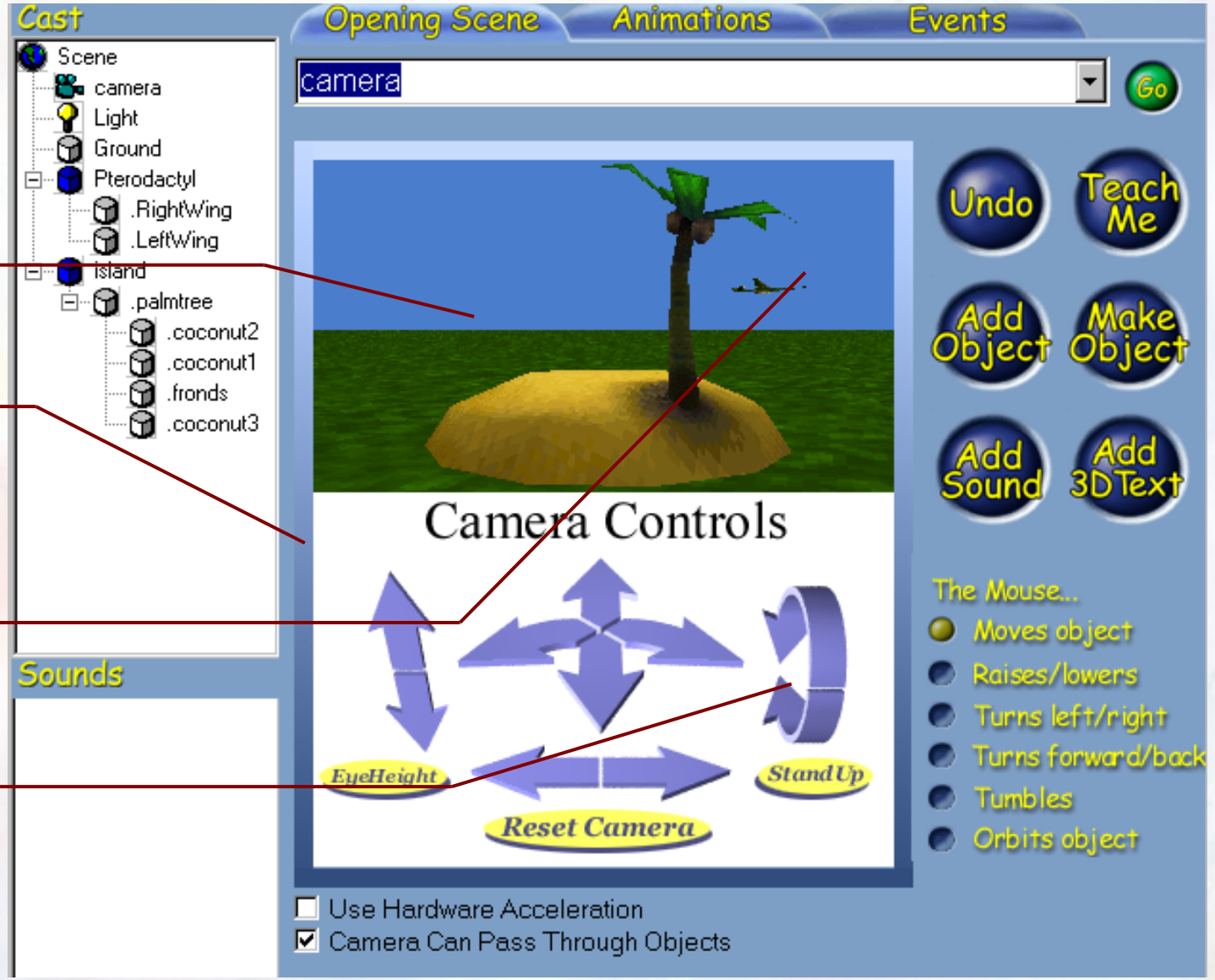
Objetos da Cena

Cena

Navegação no Espaço

Operações

Transformações com o Objeto



Alice

Scripts associados a Objetos (comporta-mento)

Codificação “arrastando e soltando”

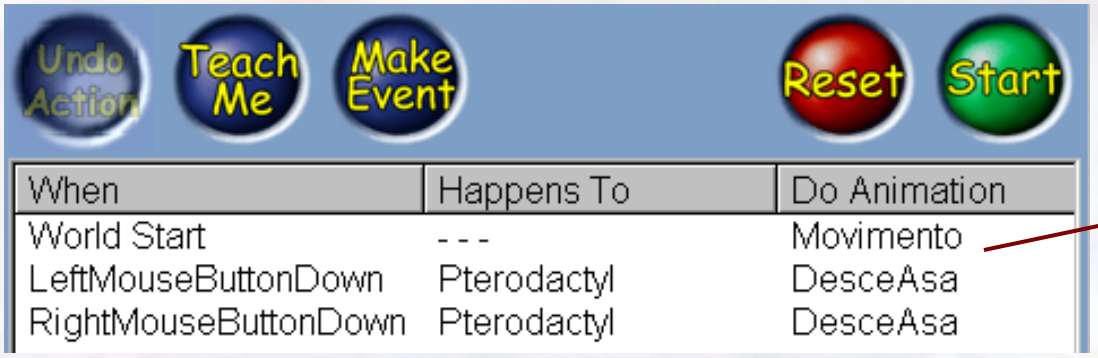
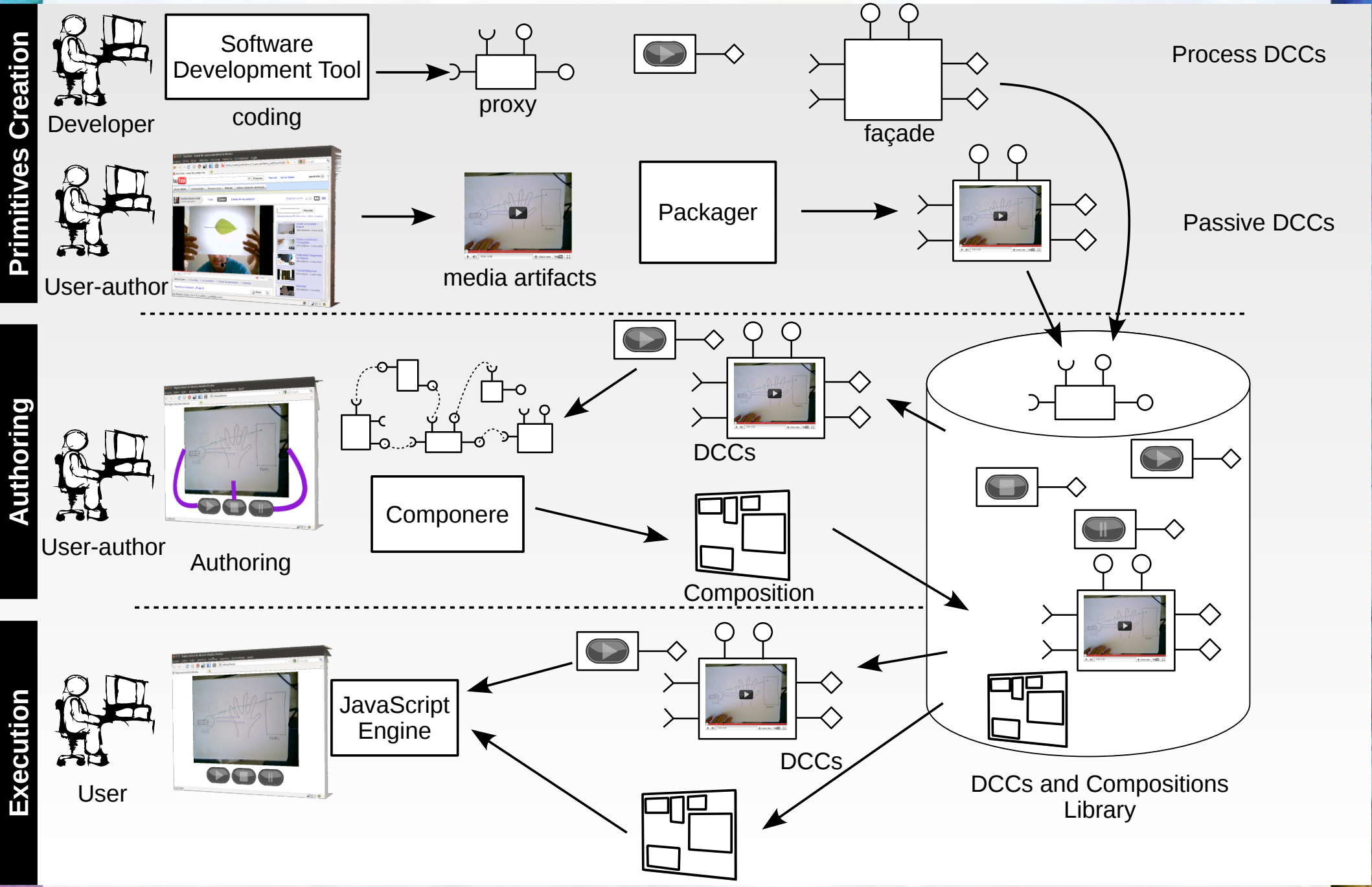


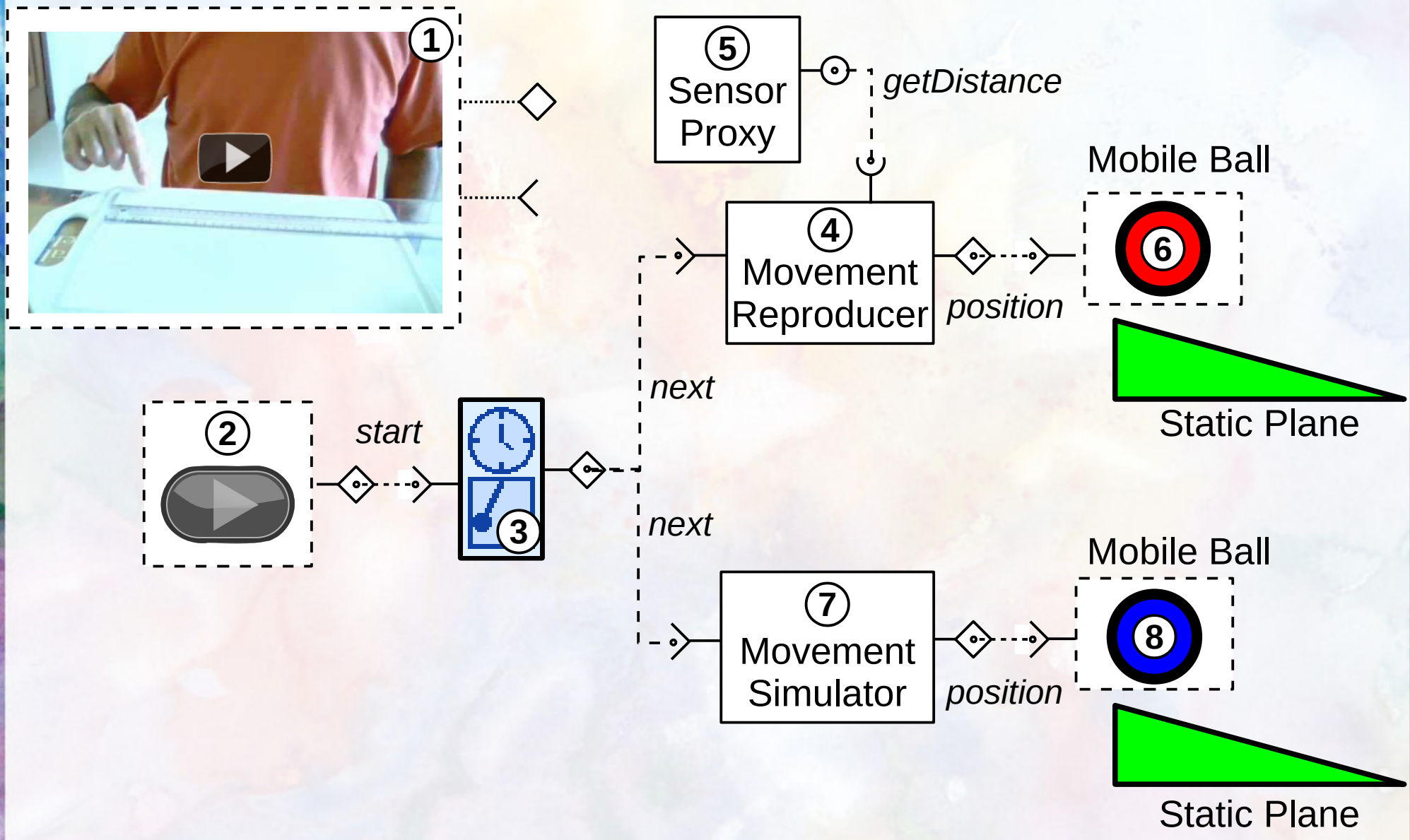
Tabela de Eventos

Componere


Primitives Creation
Developer
Software Development Tool
coding
proxy
façade
Process DCCs
User-author
media artifacts
Packager
Passive DCCs
Authoring
User-author
Authoring
Componere
DCCs
Composition
Execution
User
JavaScript Engine
DCCs
DCCs and Compositions Library

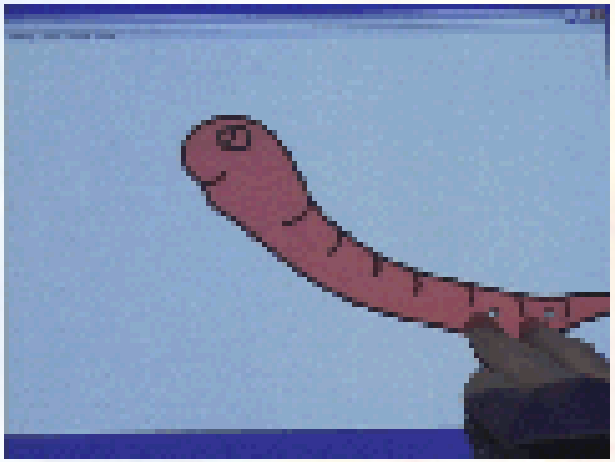
Translucens

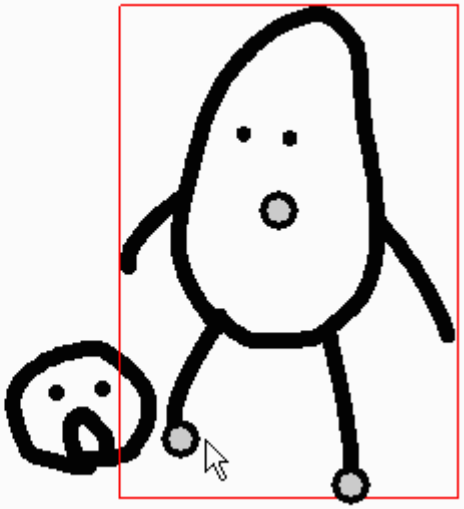
Practical Example



Ideas to Explore

Desenho Interativo





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