COMS 4115: Programming Languages and Translators

SBML: Shen Bi Ma Liang

Chinese Character: 神筆馬良

English Translation: Magic Pen Boy

Project Proposal

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Introduction

Nowadays, the rapid development of Internet has affected everyone's life, people spent more and more of their life surfing online, no matter for work or just for fun. With the trend, there are more and more people would have to do the design of webpage, to help spread information over the Internet, to let them be known by others. In order to make the process easier, and save the time for amateur web designers used to learn various techniques before they could realize their beautiful thoughts on their pages, SBML was spawned. It can generate webpage with versatile objects only based on the text commands inputted by the designer.

The name, SBML, inspired by a famous Chinese fairy tale, Shen Bi Ma Liang (Chinese characters: 神筆馬良), which is the story of a boy who has a magic pen, and whatever he drew with that pen, it going to turn alive. Unfortunately, the language can not effectively turn drawings alive, but it can make human thoughts alive on webpage.

In fact, SBML is quite a tool of generate Javascript Code which can be run by web browsers. It saved web designers from spending their time to learn various web development techniques, what they only need is the language designed by us which is easily understandable, then they don't have to anything else to design the web. By using SBML, user could create fantastic web pages with various complex shapes. Also, to make the drawings alive, users are allowed to attach events to every shape they create.

SBML also supports business application. By importing our standard library, designers may create lots of chart, such as Bar, Line which are Microsoft Excel compatible, which could be easily utilized to show demos and other fancy stuff to promote your business.

Main Features

With the help of SBML, web designers can have their work done simply by inputing a series of description text, and because multi-page operations are supported, the work for design a whole website has been eased even more. The main features are listed below:

- User could easily manipulate various objects, including lines and points, basic shapes, curved lines, images, and texts, etc.
- Everything is an object in SBML with a set of properties, user would have easy management of objects in their webpage.

• Multiple webpage can be generated by a single paragraph of program.

• User-defined events on objects within a webpage.

• Business solution supported

The Design of Language

Data Types:

Number: data type of number or integer
String: data type of drawing a string, which has 3 parameters: font, size, color.
Point: a class used to draw a point, which has a certain postion, containing 2 parameters: xstart, ystart.
Line: a class used to draw a line, which has 4 parameters: xstart, ystart, color, stroke.
Circle: a class used to draw a Circle, which has 4 parameters: radius, heart, fillcolor, color.
Polyline: a class used to draw a stepwise function, which has one parameter: stroke.
Image: a class used to load a picture on the page.
Page: a class used to add a page on the website.
Event: each event can be assigned to an object, this functionality will add interactive feature to webpage.

Reserved Functional Words:

Start (used to create a new page)
Usage example: Start page p;   //starts a page p

Born (used to create a new object)
Usage example: Born Circle c; //creates a circle c

Draw (draw an object to a page)
Usage example: Draw c>p; //draws circle c to page p

Kill (erase an object from a page)
Usage example: Kill c<p; //erases circle c from page p

Mem (save a page)
Usage example: Mem p;   //saves a page p

Operators:

+

Usage example: A+B // draw graph B which is circumscribe of A, if A and B are the
                same type of graph,turn out to be error

-

Usage example: A-B // draw graph B which is inscribe of A, if A and B are the same
                type of graph,turn out to be error

*

Usage example: A*3 // The newly computed object has the shape of A and the area of 3
                times A's area.

/

Usage example: A/3 // draw a con-centric graph size is one-third of the area of A

Iteration Operation:

i 1 to 6
{todo;}

Works like the For loop in C language, it is a programming language statement which
allows code to be repeatedly executed.

while a<3
{break;}
//A while statement is a conditional statement that performs different computations or
actions depending on whether a programmer-specified condition evaluates to true or
false. If the condition is true, the program in the block will run. If not, the program will
skip the block and continue onto the next statement.

Switch Operation:

switch(i)
case 1:
case 2:
default:
//A switch statement is a type of control statement that allows the value of a variable or
expression to control the flow of program execution.

Sample Code

```
#page
Start Page test;

#page
Born Image canvas(Point StartPoint(0,0), Size(300,300), src("blank.png"));

#Axis
Born Line axis_x (Point StartPoint(0,300), Point EndPoint(300, 300), Arrow | Stroke 1,
Color [00, 0f, 57, 98]);
Born Line axis_y (Point StartPoint(0,300), Point EndPoint(0, 0), Arrow | Stroke 1, Color
[00, 0f, 57, 98]);
#Coordinate
while cnt 1 to 5
{
 Born Line tmp (Point StartPoint(cnt*50, 300), Point EndPoint(cnt*50, 290) | Stroke 0.5,
Color[00, 0f, 57, 98]);
 Born Line tmp (Point StartPoint(0, 300-cnt*50), Point EndPoint(10, 300-cnt*50) |
Stroke 0.5, Color[00, 0f, 57, 98]);
}

#Lines
Born Line first ((0,30), (300, 50)) | Stroke 1, Color "green");
Born Line second((0,100), (300, 80)) | Stroke 1, Color "yellow");
Born Polyline third((0, 150), (30, 120), (70, 180), (150, 100), (200, 170), (300, 200) |
Stroke 1, Color "blue");
Born Polyline fourth((0, 200), (50, 200), (150, 200), (250, 250), (300, 300) | Color
"red");

#Areas
Fill Polyline(first, axis_x | Color first.Color, Enter Alert "hello World");
Fill Polyline(second, first | Color second.Color, Hover Color "white");
Fill Polyline(third, second | Color third.Color, Click Color "black");
Fill Polyline(fourth, three | Color fourth.Color, Leave color "gray");

#Label
Born String((340, 280), "This is the first graph!" | Font "Segoe UI", Weight 9pt);

Draw All > test;
Mem test;
```