Minimal Working Interpreter

Our minimally working interpreter for our final project that draws 2D fantasy map lands, parses definitions of components. For this interpreter we have only defined circles and points as our primitives, and a component can either be a circle or a new shape they can choose in future versions of this code. Users can then define a variable with the primitive components name and circle, and then scale it putting dimensions around the components. After parsing the program, our interpreter evaluates the definitions recursively building an SVG string for each component in a definition then concatenating the SVG strings. Finally, the interpreter draws the last SVG string, after evaluating the last definition.

```
Example Programs:
Example 1:
    TwoCircles 50x50 is:
        circle  point=(5,5) radius=5
        circle  point=(5,5) radius=3

Example 2:
    TwoCircles 50x50 is:
        circle  point=(5,5) radius=5
        circle  point=(5,5) radius=3
    ThreeCircles 100x100 is:
        TwoCircles
        circle point=(10,10) radius=4
```

Minimal Formal Grammar

```
<point> ::= <int> <int>

<circle> ::= <point> <int>

<dims> ::= <int> <int>

<def> ::= <name> <dims> <component>+

<component> ::= <name> | <circle>

<grammar> ::= <def>+
```

Minimal Semantics

Syntax	Abstract Syntax	Type	Prec. & Assoc	Meaning
point=(x,y)	Point = x: int; y: int	Record: int;int	n/a	Represents the coordinates of a point on a grid(canvas) using the primitive int
circle point=(5,5) radius=5	Circle of Point * int	Point*int	1/left	Circle contains its origin (point) and radius which is then drawn in SVG. Both the radius and the elements of Point must evaluate to an integer.
name	Name of string	string	n/a	Represents the name of the variable used in defining a new component
intxint	Dims = w:int; h:int	record of integers	n/a	Dims for eg. 50x50, evaluates two integers as a record of integers as width and height. Dims falls oon the definition line for a new variable that scales the shape or canvas.
definition dims is: circle point=(5,5) radius=5	Component = name or circle	Component	n/a	Component in this example circle, either evaluates a name as string of a new form or the primitive type circle.
TwoCircles 50x50 is: components	Definition of name: string; dims: Dims; components: Component list	Definition	n/a	This type defines a new variable in this case TwoCircles, that evaluates the variable name(combining form) as a string, the scale of the dimensions Dims as a record of two integers and the list of components with the primitive shapes like circle.
definition: components definition: components	grammar	Definition List	top to bottom	The definitions get parsed top to bottom, and using a dictionary, it builds SVG strings, concatenating each component, to each definition. At the end of the definition list, it then draws the last SVG string which is a compilation of eve definition's SVG string