svg-reader

0.1

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

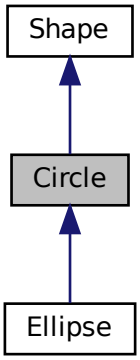
Class Documentation

3.1 Circle Class Reference

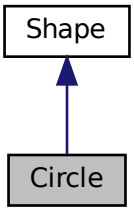
Represents a circle in 2D space.

`#include <Circle.hpp>`

Inheritance diagram for Circle:



Collaboration diagram for Circle:



Public Member Functions

- Circle (float radius, const sf::Vector2f &center, sf::Color fill, sf::Color stroke, float stroke_thickness)

  Constructs a Circle object.
- virtual std::size_t getPointCount () const

  Gets the total number of points representing the circle.
- virtual sf::Vector2f getPoint (std::size_t index) const

  Gets the position of a point on the circle.

Private Attributes

- const int SCALE

  Scale factor for determining the number of points.
- float radius

  Radius of the circle.

Additional Inherited Members

3.1.1 Detailed Description

Represents a circle in 2D space.

The Circle class is derived from the Shape class and defines a circle with a specified radius, center, fill color, stroke color, and stroke thickness.

Definition at line 13 of file Circle.hpp.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Circle()

```
Circle::Circle (
            float radius,
            const sf::Vector2f & center,
            sf::Color fill,
            sf::Color stroke,
            float stroke_thickness )
```

Constructs a Circle object.

Parameters

radius	The radius of the circle.
center	The center of the circle.
fill	Fill color of the circle.
stroke	Outline color of the circle.
stroke_thickness	Thickness of the circle outline.

Definition at line 5 of file Circle.cpp.

```
7     : radius(radius) {
8     setPosition(center);
9     setFillColor(fill);
10     setOutlineColor(stroke);
11     setOutlineThickness(stroke_thickness);
12     update();
13 }
```

3.1.3 Member Function Documentation

3.1.3.1 getPoint()

```
sf::Vector2f Circle::getPoint (
            std::size_t index ) const  [virtual]
```

Gets the position of a point on the circle.

Parameters

index	The index of the point.

Returns

The position of the specified point on the circle.

Implements Shape.

Reimplemented in Ellipse.

Definition at line 17 of file Circle.cpp.

```
17                                                {
18     static const float pi = acos(-1);
19
20     float angle = index * 2 * pi / getPointCount() - pi / 2;
21     float x = std::cos(angle) * radius;
22     float y = std::sin(angle) * radius;
23
24     return sf::Vector2f(radius + x, radius + y);
25 }
```

3.1.3.2 getPointCount()

```
std::size_t Circle::getPointCount ( ) const  [virtual]
```

Gets the total number of points representing the circle.

In this case, it returns a large number (SCALE) to approximate a smooth circle.

Returns

The number of points representing the circle.

Implements Shape.

Definition at line 15 of file Circle.cpp.

```
15 { return SCALE; }
```

3.1.4 Member Data Documentation

3.1.4.1 SCALE

```
const int Circle::SCALE  [private]
```

Initial value:

```
=
        100000
```

Scale factor for determining the number of points.

Definition at line 15 of file Circle.hpp.

The documentation for this class was generated from the following files:

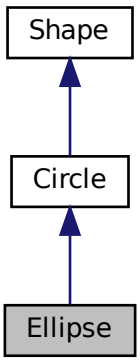
- src/graphics/Circle.hpp
- src/graphics/Circle.cpp

3.2 Ellipse Class Reference

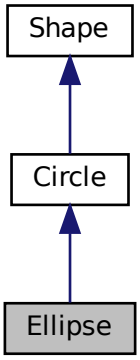
Represents an ellipse in 2D space.

`#include <Ellipse.hpp>`

Inheritance diagram for Ellipse:



Collaboration diagram for Ellipse:



Public Member Functions

- Ellipse (const sf::Vector2f &radius, const sf::Vector2f &center, sf::Color fill, sf::Color stroke, float stroke_↩ thickness)

  Constructs an Ellipse object.
- virtual sf::Vector2f getPoint (std::size_t index) const override

  Gets the position of a point on the ellipse.

Private Attributes

- sf::Vector2f radius

  Radii of the ellipse in the x and y directions.

Additional Inherited Members

3.2.1 Detailed Description

Represents an ellipse in 2D space.

The Ellipse class is derived from the Circle class and defines an ellipse with a variable radius in the x and y directions.

Definition at line 12 of file Ellipse.hpp.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 Ellipse()

```
Ellipse::Ellipse (
            const sf::Vector2f & radius,
            const sf::Vector2f & center,
            sf::Color fill,
            sf::Color stroke,
            float stroke_thickness )
```

Constructs an Ellipse object.

Parameters

radius	The radii of the ellipse in the x and y directions.
center	The center of the ellipse.
fill	Fill color of the ellipse.
stroke	Outline color of the ellipse.
stroke_thickness	Thickness of the ellipse outline.

Definition at line 5 of file Ellipse.cpp.

```
7     : Circle(l.f, center, fill, stroke, stroke_thickness), radius(radius) {
8     update();
9 }
```

3.2.3 Member Function Documentation

3.2.3.1 getPoint()

```
sf::Vector2f Ellipse::getPoint (
            std::size_t index ) const  [override], [virtual]
```

Gets the position of a point on the ellipse.

Parameters

index	The index of the point.

Returns

The position of the specified point on the ellipse.

Reimplemented from Circle.

Definition at line 11 of file Ellipse.cpp.

```
11                                                  {
12     static const float pi = acos(-1);
13
14     float angle = index * 2 * pi / getPointCount() - pi / 2;
15     float x = std::cos(angle) * radius.x;
16     float y = std::sin(angle) * radius.y;
17
18     return sf::Vector2f(radius.x + x, radius.y + y);
19 }
```

The documentation for this class was generated from the following files:

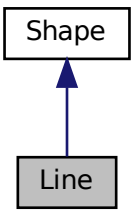
- src/graphics/Ellipse.hpp
- src/graphics/Ellipse.cpp

3.3 Line Class Reference

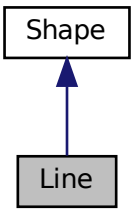
Represents a line in 2D space.

`#include <Line.hpp>`

Inheritance diagram for Line:



Collaboration diagram for Line:



Public Member Functions

- Line (const sf::Vector2f &point1, const sf::Vector2f &point2, sf::Color stroke=sf::Color::White, float stroke_↩ width=1.f)

  Constructs a Line object.
- void setThickness (float thickness)

  Sets the thickness of the line.
- float getLength () const

  Calculates and returns the length of the line.
- virtual std::size_t getPointCount () const

  Gets the total number of points representing the line.
- virtual sf::Vector2f getPoint (std::size_t index) const

  Gets the position of a point on the line.

Private Attributes

- sf::Vector2f direction

  Direction of the line.
- float thickness

  Thickness of the line.

Additional Inherited Members

3.3.1 Detailed Description

Represents a line in 2D space.

The Line class is derived from the Shape class and defines a line segment with a specified direction and thickness.

Definition at line 14 of file Line.hpp.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 Line()

```
Line::Line (
            const sf::Vector2f & point1,
            const sf::Vector2f & point2,
            sf::Color stroke = sf::Color::White,
            float stroke_width = 1.f )
```

Constructs a Line object.

Parameters

point1	The starting point of the line.
point2	The ending point of the line.
stroke	The color of the line (default is sf::Color::White).
stroke_width	The thickness of the line (default is 1.0).

Definition at line 3 of file Line.cpp.

```
5     : direction(point2 - point1), thickness(stroke_width) {
6     setPosition(point1);
7     setThickness(stroke_width);
8     setFillColor(stroke);
9     update();
10 }
```

3.3.3 Member Function Documentation

3.3.3.1 getLength()

```
float Line::getLength ( ) const
```

Calculates and returns the length of the line.

Returns

The length of the line.

Definition at line 14 of file Line.cpp.

```
14                              {
15     return std::sqrt(direction.x * direction.x + direction.y * direction.y);
16 }
```

3.3.3.2 getPoint()

```
sf::Vector2f Line::getPoint (
            std::size_t index ) const  [virtual]
```

Gets the position of a point on the line.

Parameters

index	The index of the point (0 for the starting point, 1 for the end point, 2 for the first additional point, 3 for the second additional point).

Returns

The position of the specified point on the line.

Implements Shape.

Definition at line 20 of file Line.cpp.

```
20                                              {
21     sf::Vector2f unitDirection = direction / getLength();
22     sf::Vector2f unitPerpendicular(-unitDirection.y, unitDirection.x);
23
24     sf::Vector2f offset = (thickness / 2.f) * unitPerpendicular;
25
26     switch (index) {
27         default:
28         case 0:
29             return offset;
30         case 1:
31             return (direction + offset);
32         case 2:
33             return (direction - offset);
34         case 3:
35             return (-offset);
36     }
37 }
```

3.3.3.3 getPointCount()

```
std::size_t Line::getPointCount ( ) const  [virtual]
```

Gets the total number of points representing the line.

In this case, it always returns 4 since a line is represented by 4 points (start, end, and two additional points for thickness).

Returns

The number of points representing the line.

Implements Shape.

Definition at line 18 of file Line.cpp.

```
18 { return 4; }
```

3.3.3.4 setThickness()

```
void Line::setThickness (
             float thickness )
```

Sets the thickness of the line.

Parameters

thickness	The new thickness of the line.

Definition at line 12 of file Line.cpp.

```
12 { thickness = thickness; }
```

The documentation for this class was generated from the following files:

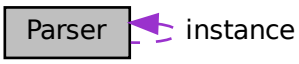
- src/graphics/Line.hpp
- src/graphics/Line.cpp

3.4 Parser Class Reference

Represents a parser for SVG files.

`#include <Parser.hpp>`

Collaboration diagram for Parser:



Public Member Functions

- Parser (const Parser &)=delete

  Deleted assignment operator to prevent copying of Parser instances.
- std::string getAttribute (pugi::xml_node node, std::string name)

  Get the Attribute object which is parsed from the XML file.
- sf::Color parseColor (pugi::xml_node node, std::string name)

  Parse the color from the XML file.
- std::vector< sf::Vector2f > parsePoints (pugi::xml_node node)

  Parse the points from the XML file.
- void parseSVG ()

  Parse the XML file.
- void renderSVG (sf::RenderWindow &window)

  Render the shapes on the window.
- ~Parser ()

  Destructor of Parser.

Static Public Member Functions

- static Parser * getInstance (const std::string &file_name)

  Gets the singleton instance of Parser.

Private Member Functions

- Parser (const std::string &file_name)

  Construct a new Parser object.

Private Attributes

- pugi::xml_node svg

  The node of the SVG.
- std::vector< Shape * > shapes

  The vector of the shapes.

Static Private Attributes

- static Parser * instance = nullptr

  The instance of the Parser.

3.4.1 Detailed Description

Represents a parser for SVG files.

The parser class is responsible for parsing XML attributes (SVG files) and passing this information to create shapes and render them.

Definition at line 13 of file Parser.hpp.

3.4.2 Constructor & Destructor Documentation

3.4.2.1 Parser() [1/2]

```
Parser::Parser (
            const Parser &  )  [delete]
```

Deleted assignment operator to prevent copying of Parser instances.

Returns

The Parser instance.

Note

This function is deleted because Parser is a singleton class.

3.4.2.2 Parser() [2/2]

```
Parser::Parser (
            const std::string & file_name )  [private]
```

Construct a new Parser object.

Parameters

file_name	The name of the file to be parsed.

Definition at line 16 of file Parser.cpp.

```
16                                          {
17     pugi::xml_document doc;
18     pugi::xml_parse_result result = doc.load_file(file_name.c_str());
19     if (!result) EXIT_FAILURE;
20     svg = doc.child("svg");
21 }
```

3.4.3 Member Function Documentation

3.4.3.1 getAttribute()

```
std::string Parser::getAttribute (
             pugi::xml_node node,
             std::string name )
```

Get the Attribute object which is parsed from the XML file.

Parameters

node	The node of the XML file (pugi::xml_node is a typedef of pugixml)
name	The name of the attribute.

Returns

The attribute which is parsed from the XML file.

Note

This function is private because it is only used by the Parser class.

Definition at line 23 of file Parser.cpp.

```
23                                                                  {
24     pugi::xml_attribute attr = node.attribute(name.c_str());
25     if (!attr) {
26         if (name == "fill")
27             return "black";
28         else if (name == "stroke")
29             return "none";
30         else if (name == "stroke-width" || name == "stroke-opacity" ||
31                  name == "fill-opacity" || name == "opacity")
32             return "1";
33         else if (name == "r" || name == "cx" || name == "cy" || name == "x" ||
34                  name == "y" || name == "width" || name == "height")
35             return "0";
36     }
37     return attr.value();
38 };
```

3.4.3.2 getInstance()

```
Parser * Parser::getInstance (
            const std::string & file_name )  [static]
```

Gets the singleton instance of Parser.

Parameters

file_name	The name of the SVG file to parse.

Returns

The singleton instance of Parser.

Note

This function is thread-safe.

Definition at line 8 of file Parser.cpp.

```
8                                                                   {
9     if (instance == nullptr) {
10         instance = new Parser(file_name);
11         instance->parseSVG();
12     }
13     return instance;
14 }
```

3.4.3.3 parseColor()

```
sf::Color Parser::parseColor (
            pugi::xml_node node,
            std::string name )
```

Parse the color from the XML file.

Parameters

node	The node of the XML file (pugi::xml_node is a typedef of pugixml)
name	The name of the attribute.

Returns

The color which is parsed from the XML file.

Note

This function is private because it is only used by the Parser class.

The color is represented by sf::Color (SFML)

The color is parsed from the XML file in the format of "rgb(r, g, b)".

Definition at line 40 of file Parser.cpp.

```
40                                                                  {
41     auto getAtribColor = [](std::string color) -> sf::Color {
42         std::string c = "";
43         std::vector< int > rgb;
44         for (int i = 4; i < (int)color.size(); ++i) {
45             if ('0' <= color[i] && color[i] <= '9') {
46                 c += color[i];
47             } else {
48                 if (c.size() > 0) {
49                     rgb.push_back(std::stoi(c));
50                     c.clear();
51                 }
52             }
53         }
54
55         sf::Color result = sf::Color(rgb[0], rgb[1], rgb[2]);
56         return result;
57     };
58
59     std::string color = getAttribute(node, name);
60     for (auto& c : color) c = tolower(c);
61     if (color == "none")
62         return sf::Color::Transparent;
63     else {
64         sf::Color result;
65         if (color.find("rgb") == std::string::npos) {
66             auto color_code = color_map.find(color);
67             if (color_code == color_map.end()) exit(-1);
68             result = color_code->second;
69         } else
70             result = getAtribColor(color);
71
72         result.a = std::stof(getAttribute(node, name + "-opacity")) *
73                    std::stof(getAttribute(node, "opacity")) * 255;
74         return result;
75     }
76 }
```

3.4.3.4 parsePoints()

```
std::vector< sf::Vector2f > Parser::parsePoints (
            pugi::xml_node node )
```

Parse the points from the XML file.

Parameters

node	The node of the XML file (pugi::xml_node is a typedef of pugixml)

Returns

The points which are parsed from the XML file.

Note

This function is private because it is only used by the Parser class.

The points are represented by std::vector< sf::Vector2f > (SFML)

The points are parsed from the XML file in the format of "x1,y1 x2,y2 x3,y3 ...".

Definition at line 78 of file Parser.cpp.

```
78                                                                  {
79     std::vector< sf::Vector2f > points;
80     std::string points_string = getAttribute(node, "points");
```

```
81      std::string point = "";
82      int pos = 0;
83      float x = 0, y = 0;
84      for (int i = 0; i < (int)points_string.size(); i++) {
85          if (points_string[i] == ' ') {
86              if (point.size() > 0) {
87                  pos = point.find(',');
88                  x = std::stof(point.substr(0, pos));
89                  y = std::stof(point.substr(pos + 1));
90                  points.push_back(sf::Vector2f(x, y));
91                  point.clear();
92              }
93          } else {
94              point += points_string[i];
95          }
96      }
97
98      if (point.size() > 0) {
99          pos = point.find(',');
100          x = std::stof(point.substr(0, pos));
101          y = std::stof(point.substr(pos + 1));
102          points.push_back(sf::Vector2f(x, y));
103      }
104
105      return points;
106  }
```

3.4.3.5 parseSVG()

```
void Parser::parseSVG ( )
```

Parse the XML file.

Parameters

window	The window to render the shapes on.

Note

This function is private because it is only used by the Parser class.

The shapes are rendered on the window by calling the draw() method of the Shape class.

The shapes are rendered on the window in the order of the XML file.

Definition at line 108 of file Parser.cpp.

```
108                         {
109      for (pugi::xml_node tool = svg.first_child(); tool;
110           tool = tool.next_sibling()) {
111          sf::Color stroke_color = parseColor(tool, "stroke");
112          sf::Color fill_color = parseColor(tool, "fill");
113
114          float stroke_width = std::stof(getAttribute(tool, "stroke-width"));
115
116          if (tool.name() == std::string("rect")) {
117              Rect* shape = new Rect(std::stof(getAttribute(tool, "width")),
118                                     std::stof(getAttribute(tool, "height")),
119                                     std::stof(getAttribute(tool, "x")),
120                                     std::stof(getAttribute(tool, "y")),
121                                     fill_color, stroke_color, stroke_width);
122              shapes.push_back(shape);
123          } else if (tool.name() == std::string("line")) {
124              Line* shape =
125                  new Line(sf::Vector2f(std::stof(getAttribute(tool, "x1")),
126                                        std::stof(getAttribute(tool, "y1"))),
127                           sf::Vector2f(std::stof(getAttribute(tool, "x2")),
128                                        std::stof(getAttribute(tool, "y2"))),
129                           stroke_color, stroke_width);
130              shapes.push_back(shape);
131          } else if (tool.name() == std::string("text")) {
```

```
132             float x = std::stof(getAttribute(tool, "x"));
133             float y = std::stof(getAttribute(tool, "y"));
134             float font_size = std::stof(getAttribute(tool, "font-size"));
135             sf::String text = tool.text().get();
136             Text* shape = new Text(sf::Vector2f(x, y - font_size), text,
137                                    fill_color, font_size);
138             shapes.push_back(shape);
139         } else if (tool.name() == std::string("circle")) {
140             float radius = std::stof(getAttribute(tool, "r"));
141             Circle* shape = new Circle(
142                 radius,
143                 sf::Vector2f(std::stof(getAttribute(tool, "cx")) - radius,
144                              std::stof(getAttribute(tool, "cy")) - radius),
145                 fill_color, stroke_color, stroke_width);
146             shapes.push_back(shape);
147         } else if (tool.name() == std::string("ellipse")) {
148             float radius_x = std::stof(getAttribute(tool, "rx"));
149             float radius_y = std::stof(getAttribute(tool, "ry"));
150             Ellipse* shape = new Ellipse(
151                 sf::Vector2f(radius_x, radius_y),
152                 sf::Vector2f(std::stof(getAttribute(tool, "cx")) - radius_x,
153                              std::stof(getAttribute(tool, "cy")) - radius_y),
154                 fill_color, stroke_color, stroke_width);
155             shapes.push_back(shape);
156         } else if (tool.name() == std::string("polygon")) {
157             Polygon* shape =
158                 new Polygon(fill_color, stroke_color, stroke_width);
159             std::vector< sf::Vector2f > points = parsePoints(tool);
160             for (auto point : points) {
161                 shape->addPoint(point);
162             }
163             shape->polygonUpdate();
164             shapes.push_back(shape);
165         } else if (tool.name() == std::string("polyline")) {
166             Polyline* shape =
167                 new Polyline(stroke_width, stroke_color, fill_color);
168             std::vector< sf::Vector2f > points = parsePoints(tool);
169             for (auto point : points) {
170                 shape->addPoint(point);
171             }
172             shape->polylineUpdate();
173             shapes.push_back(shape);
174         } else if (tool.name() == std::string("path")) {
175             /*
176
177             PATH
178
179             */
180         } else {
181             continue;
182         }
183     }
184 }
```

3.4.3.6 renderSVG()

```
void Parser::renderSVG (
            sf::RenderWindow & window )
```

Render the shapes on the window.

Parameters

window	The window to render the shapes on.

Note

This function is private because it is only used by the Parser class.

The shapes are rendered on the window by calling the draw() method of the Shape class.

The shapes are rendered on the window in the order of the XML file.

Apply Polymorphism to render the shapes on the window.

Definition at line 186 of file Parser.cpp.

```
186                                                 {
187     for (auto shape : shapes) {
188         shape->draw(window);
189     }
190 }
```

The documentation for this class was generated from the following files:

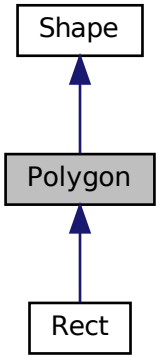
- src/Parser.hpp
- src/Parser.cpp

3.5 Polygon Class Reference

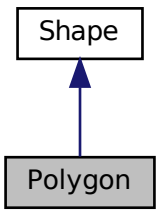
Represents a polygon in 2D space.

`#include <Polygon.hpp>`

Inheritance diagram for Polygon:



Collaboration diagram for Polygon:



Public Member Functions

- Polygon (sf::Color fill=sf::Color::Transparent, sf::Color stroke=sf::Color::White, float stroke_thickness=0)

  Constructs a Polygon object.
- virtual std::size_t getPointCount () const

  Gets the total number of vertices representing the polygon.
- virtual sf::Vector2f getPoint (std::size_t index) const

  Gets the position of a vertex in the polygon.
- void addPoint (const sf::Vector2f &point)

  Adds a vertex to the polygon.
- void polygonUpdate ()

  Updates the polygon.

Private Attributes

- std::vector< sf::Vector2f > points

  Vertices of the polygon.

Additional Inherited Members

3.5.1 Detailed Description

Represents a polygon in 2D space.

The Polygon class is derived from the Shape class and defines a polygon with a variable number of vertices.

Definition at line 15 of file Polygon.hpp.

3.5.2 Constructor & Destructor Documentation

3.5.2.1 Polygon()

```
Polygon::Polygon (
            sf::Color fill = sf::Color::Transparent,
            sf::Color stroke = sf::Color::White,
            float stroke_thickness = 0 )
```

Constructs a Polygon object.

Parameters

fill	Fill color of the polygon (default is sf::Color::Transparent).
stroke	Outline color of the polygon (default is sf::Color::White).
stroke_thickness	Thickness of the polygon outline (default is 0).

Definition at line 3 of file Polygon.cpp.

```
3                                                                                {
4     setFillColor(fill);
5     setOutlineColor(stroke);
6     setOutlineThickness(stroke_thickness);
7 }
```

3.5.3 Member Function Documentation

3.5.3.1 addPoint()

```
void Polygon::addPoint (
            const sf::Vector2f & point )
```

Adds a vertex to the polygon.

Parameters

point	The position of the vertex to be added.

Definition at line 19 of file Polygon.cpp.

```
19 { points.push_back(point); }
```

3.5.3.2 getPoint()

```
sf::Vector2f Polygon::getPoint (
            std::size_t index ) const  [virtual]
```

Gets the position of a vertex in the polygon.

Parameters

index	The index of the vertex.

Returns

The position of the specified vertex in the polygon.

Implements Shape.

Reimplemented in Rect.

Definition at line 11 of file Polygon.cpp.

```
11                                                      {
12     if (index < points.size()) {
13         return points[index];
14     } else {
15         return points[index % points.size()];
16     }
17 }
```

3.5.3.3 getPointCount()

```
std::size_t Polygon::getPointCount ( ) const  [virtual]
```

Gets the total number of vertices representing the polygon.

Returns

The number of vertices representing the polygon.

Implements Shape.

Reimplemented in Rect.

Definition at line 9 of file Polygon.cpp.

```
9 { return points.size(); }
```

3.5.3.4 polygonUpdate()

```
void Polygon::polygonUpdate ( )
```

Updates the polygon.

This method is provided for consistency with other shapes but does not introduce any additional behavior for polygons.

Definition at line 21 of file Polygon.cpp.

```
21 { update(); }
```

The documentation for this class was generated from the following files:

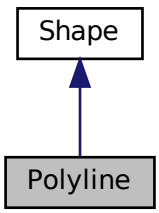
- src/graphics/Polygon.hpp
- src/graphics/Polygon.cpp

3.6 Polyline Class Reference

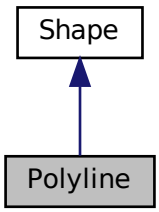
Represents a polyline in 2D space.

```
#include <Polyline.hpp>
```

Inheritance diagram for Polyline:



Collaboration diagram for Polyline:



Public Member Functions

- Polyline (float stroke_Width=0, const sf::Color &stroke_color=sf::Color::White, const sf::Color &fill=sf::Color↩ ::Transparent)

  Constructs a Polyline object.
- void addPoint (const sf::Vector2f &point)

  Adds a vertex to the polyline.
- void draw (sf::RenderWindow &target, sf::RenderStates states=sf::RenderStates::Default) const

  Draws the polyline on the specified render target.
- sf::Vector2f getPoint (std::size_t index) const override

  Gets the position of a vertex in the polyline.
- std::size_t getPointCount () const override

  Gets the total number of vertices representing the polyline.
- void polylineUpdate ()

  Updates the polyline.

Private Attributes

- std::vector< sf::Vector2f > points

  Vertices of the polyline.

Additional Inherited Members

3.6.1 Detailed Description

Represents a polyline in 2D space.

The Polyline class is derived from the Shape class and defines a polyline with a variable number of vertices.

Definition at line 17 of file Polyline.hpp.

3.6.2 Constructor & Destructor Documentation

3.6.2.1 Polyline()

```
Polyline::Polyline (
            float stroke_Width = 0,
            const sf::Color & stroke_color = sf::Color::White,
            const sf::Color & fill = sf::Color::Transparent )
```

Constructs a Polyline object.

Parameters

stroke_Width	The stroke width of the polyline (default is 0).
stroke_color	The stroke color of the polyline (default is sf::Color::White).
fill	The fill color of the polyline (default is sf::Color::Transparent).

Definition at line 145 of file Polyline.cpp.

```
146                                         {
147     setOutlineThickness(stroke_width);
148     setOutlineColor(stroke_color);
149     setFillColor(fill);
150 }
```

3.6.3 Member Function Documentation

3.6.3.1 addPoint()

```
void Polyline::addPoint (
            const sf::Vector2f & point )
```

Adds a vertex to the polyline.

Parameters

point	The position of the vertex to be added.

Definition at line 152 of file Polyline.cpp.

```
152 { points.push_back(point); }
```

3.6.3.2 draw()

```
void Polyline::draw (
            sf::RenderWindow & target,
            sf::RenderStates states = sf::RenderStates::Default ) const  [virtual]
```

Draws the polyline on the specified render target.

Parameters

target	The render target to draw on.
states	The render states to apply (default is sf::RenderStates::Default).

Reimplemented from Shape.

Definition at line 164 of file Polyline.cpp.

```
164                                                                                 {
165     if (points.size() < 2) return;
166     sf::VertexArray lineStrip(sf::PrimitiveType::Quads);
167     sf::Vector2f p1a, p1b, p2a, p2b;
168     sf::Vector2f r_p1a, r_p1b, r_p2a, r_p2b;
169     for (std::size_t i = 1; i < points.size(); i++) {
170         sf::Vector2f p1 = points[i - 1];
171         sf::Vector2f p2 = points[i];
172 
173         sf::Vector2f delta = p2 - p1;
174         float length = std::sqrt(delta.x * delta.x + delta.y * delta.y);
175 
176         sf::Vector2f unitDirection = delta / length;
177 
178         sf::Vector2f perpendicularDirection(-unitDirection.y, unitDirection.x);
179 
180         float thickness = getOutlineThickness();
181         sf::Color stroke = getOutlineColor();
182 
183         p1a = p1 - perpendicularDirection * (thickness / 2.0f);
184         p1b = p1 + perpendicularDirection * (thickness / 2.0f);
185         p2a = p2 - perpendicularDirection * (thickness / 2.0f);
186         p2b = p2 + perpendicularDirection * (thickness / 2.0f);
187         if (i > 1) {
188             sf::VertexArray lS(sf::PrimitiveType::Quads);
189             if (isPerpendicular({points[i], points[i - 1]},
190                                 {points[i - 1], points[i - 2]})) {
191                 lS.append(sf::Vertex(
192                     findIntersection({r_p1a, r_p2a}, {p1a, p2a}), stroke));
193                 lS.append(sf::Vertex(
194                     findIntersection({r_p1a, r_p2a}, {p1b, p2b}), stroke));
195                 lS.append(sf::Vertex(
196                     findIntersection({r_p1b, r_p2b}, {p1b, p2b}), stroke));
197                 lS.append(sf::Vertex(
198                     findIntersection({r_p1b, r_p2b}, {p1a, p2a}), stroke));
199 
200             } else {
201                 lS.append(sf::Vertex(p1a, stroke));
202                 lS.append(sf::Vertex(r_p2a, stroke));
203                 lS.append(sf::Vertex(p1b, stroke));
204                 lS.append(sf::Vertex(r_p2b, stroke));
205             }
206             target.draw(lS);
207         }
208         r_p1a = p1a;
209         r_p1b = p1b;
210         r_p2a = p2a;
211         r_p2b = p2b;
212         lineStrip.append(sf::Vertex(p1a, stroke));
213         lineStrip.append(sf::Vertex(p1b, stroke));
214         lineStrip.append(sf::Vertex(p2b, stroke));
215         lineStrip.append(sf::Vertex(p2a, stroke));
216     }
217     std::vector< ClosedPolygon > cP = findClosedPolygons(points);
218     if (cP.size() > 0) {
219         sf::Color fillColor = getFillColor();
220         for (const ClosedPolygon& polygon : cP) {
221             if (polygon.cP.size() > 2) {  // Ensure it's a valid polygon
222                 sf::ConvexShape fillShape;
223                 fillShape.setFillColor(fillColor);
224                 fillShape.setOutlineThickness(0);
225                 fillShape.setPointCount(polygon.cP.size());
226 
227                 // Set the points of the shape based on the polygon
228                 for (std::size_t j = 0; j < polygon.cP.size(); j++) {
229                     fillShape.setPoint(j, polygon.cP[j]);
230                 }
231 
232                 target.draw(fillShape);
233             }
234         }
235         target.draw(lineStrip);
236     }
237 }
```

3.6.3.3 getPoint()

```
sf::Vector2f Polyline::getPoint (
            std::size_t index ) const  [override], [virtual]
```

Gets the position of a vertex in the polyline.

Parameters

index	The index of the vertex.

Returns

The position of the specified vertex in the polyline.

Implements Shape.

Definition at line 156 of file Polyline.cpp.

```
156                                                 {
157     if (index < points.size()) {
158         return points[index];
159     }
160     return sf::Vector2f(0, 0);
161 }
```

3.6.3.4 getPointCount()

```
std::size_t Polyline::getPointCount ( ) const  [override], [virtual]
```

Gets the total number of vertices representing the polyline.

Returns

The number of vertices representing the polyline.

Implements Shape.

Definition at line 163 of file Polyline.cpp.

```
163 { return points.size(); }
```

3.6.3.5 polylineUpdate()

```
void Polyline::polylineUpdate ( )
```

Updates the polyline.

This method is provided for consistency with other shapes but does not introduce any additional behavior for polylines.

Definition at line 154 of file Polyline.cpp.

```
154 { update(); }
```

The documentation for this class was generated from the following files:

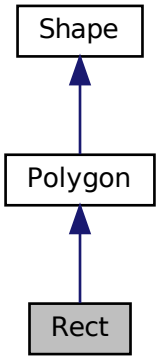
- src/graphics/Polyline.hpp
- src/graphics/Polyline.cpp

3.7 Rect Class Reference

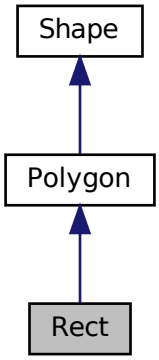
Represents a rectangle in 2D space.

`#include <Rect.hpp>`

Inheritance diagram for Rect:



Collaboration diagram for Rect:



Public Member Functions

- Rect (float width, float height, float x, float y, sf::Color fill, sf::Color stroke, float stroke_thickness)

  Constructs a Rect object.
- virtual std::size_t getPointCount () const override

  Gets the total number of vertices representing the rectangle.
- virtual sf::Vector2f getPoint (std::size_t index) const override

  Gets the position of a vertex in the rectangle.

Private Attributes

- float width

  Width of the rectangle.
- float height

  Height of the rectangle.
- sf::Vector2f rect_size

  Size of the rectangle.

Additional Inherited Members

3.7.1 Detailed Description

Represents a rectangle in 2D space.

The Rect class is derived from the Polygon class and defines a rectangle with a specified width, height, position, fill color, stroke color, and stroke thickness.

Definition at line 13 of file Rect.hpp.

3.7.2 Constructor & Destructor Documentation

3.7.2.1 Rect()

```
Rect::Rect (
            float width,
            float height,
            float x,
            float y,
            sf::Color fill,
            sf::Color stroke,
            float stroke_thickness )
```

Constructs a Rect object.

Parameters

width	The width of the rectangle.
height	The height of the rectangle.
x	The X-coordinate of the position.
y	The Y-coordinate of the position.
fill	Fill color of the rectangle.
stroke	Outline color of the rectangle.
stroke_thickness	Thickness of the rectangle outline.

Definition at line 3 of file Rect.cpp.

```
5     : Polygon(fill, stroke, stroke_thickness), width(width), height(height) {
6     addPoint(sf::Vector2f(0, 0));
7     addPoint(sf::Vector2f(width, 0));
8     addPoint(sf::Vector2f(width, height));
9     addPoint(sf::Vector2f(0, height));
10
11     setPosition(x, y);
12     update();
13 }
```

3.7.3 Member Function Documentation

3.7.3.1 getPoint()

```
sf::Vector2f Rect::getPoint (
            std::size_t index ) const  [override], [virtual]
```

Gets the position of a vertex in the rectangle.

Parameters

index	The index of the vertex (0 for top-left, 1 for top-right, 2 for bottom-right, 3 for bottom-left).

Returns

The position of the specified vertex in the rectangle.

Reimplemented from Polygon.

Definition at line 19 of file Rect.cpp.

```
19                                              {
20     return Polygon::getPoint(index);  // Inherited from Polygon
21 }
```

3.7.3.2 getPointCount()

```
std::size_t Rect::getPointCount ( ) const  [override], [virtual]
```

Gets the total number of vertices representing the rectangle.

In this case, it always returns 4 since a rectangle has four corners.

Returns

The number of vertices representing the rectangle.

Reimplemented from Polygon.

Definition at line 15 of file Rect.cpp.

```
15                                  {
16     return Polygon::getPointCount();  // Inherited from Polygon
17 }
```

The documentation for this class was generated from the following files:

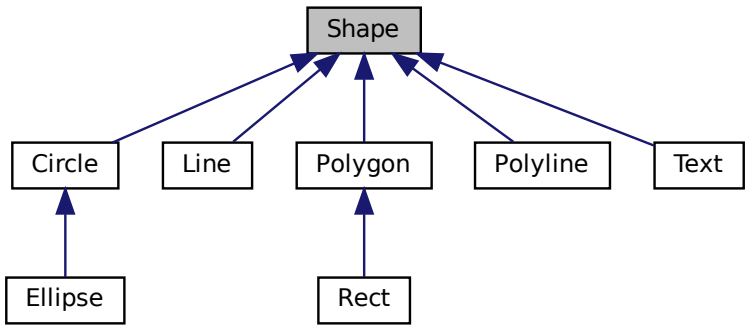
- src/graphics/Rect.hpp
- src/graphics/Rect.cpp

3.8 Shape Class Reference

Represents a shape in 2D space.

`#include <Shape.hpp>`

Inheritance diagram for Shape:



Public Member Functions

- virtual ~Shape ()=default

  Virtual constructor.
- void setFillColor (const sf::Color &color)

  Sets the fill color of the shape.
- void setOutlineColor (const sf::Color &color)

  Sets the outline color of the shape.
- void setOutlineThickness (float thickness)

  Sets the outline thickness of the shape.
- const sf::Color & getFillColor () const

  Gets the fill color of the shape.
- const sf::Color & getOutlineColor () const

  Gets the outline color of the shape.
- float getOutlineThickness () const

  Gets the outline thickness of the shape.
- void setPosition (float x, float y)

  Sets the position of the shape.
- void setPosition (const sf::Vector2f &position)

  Sets the position of the shape.
- virtual std::size_t getPointCount () const =0

  Virtual method: Get the number of point of the shape (for Polygon shape)
- virtual sf::Vector2f getPoint (std::size_t index) const =0

  Virtual method: Get the position of the point on the shape (for Polygon shape)
- virtual void draw (sf::RenderWindow &target, sf::RenderStates states=sf::RenderStates::Default) const

  Virtual method: Draw the shape on the specified render target.
- const sf::Transform & getTransform () const

  Gets the shape transform.
- const sf::Transform & getInverseTransform () const

  Gets the inverse shape transform.

Protected Member Functions

- Shape ()

  Constructs a Shape object.
- void update ()

  Sets the texture of the shape.

Private Member Functions

- void updateFillColors ()

  Updates the fill colors of the shape.
- void updateOutline ()

  Updates the outline of the shape.
- void updateOutlineColors ()

  Updates the outline colors of the shape.

Private Attributes

- const sf::Texture * texture

  Texture of the shape.
- sf::Color fill_color

  Fill color.
- sf::Color outline_color

  Outline color.
- float outline_thickness

  Thickness of the shape's outline.
- sf::VertexArray vertices

  Vertex array containing the fill geometry.
- sf::VertexArray outline_vertices

  Vertex array containing the outline geometry.
- sf::FloatRect inside_bounds

  Bounding rectangle of the inside (fill)
- sf::FloatRect bounds

  Bounding rectangle of the outside (outline + fill)
- sf::Vector2f origin

  Origin of translation/rotation/scaling of the object.
- sf::Vector2f position

  Position of the object in the 2D world.
- float rotation

  Orientation of the object, in degrees.
- sf::Vector2f scale

  Scale of the object.
- sf::Transform transform

  Combined transformation of the object.
- bool transform_need_update

  Does the transform need to be recomputed?
- sf::Transform inverse_transform

  Combined transformation of the object.
- bool inverse_transform_need_update

  Same as transform but for inverse.

3.8.1 Detailed Description

Represents a shape in 2D space.

Note

This class is abstract and cannot be instantiated.

This class is applied Abstract Factory design pattern and used as interface for other shapes.

Definition at line 16 of file Shape.hpp.

3.8.2 Constructor & Destructor Documentation

3.8.2.1 Shape()

```
Shape::Shape ( )  [protected]
```

Constructs a Shape object.

Note

This constructor is protected because Shape is an abstract class that cannot be instantiated.

Definition at line 40 of file Shape.cpp.

```
41     : texture(nullptr), fill_color(255, 255, 255), outline_color(255, 255, 255),
42       outline_thickness(0), vertices(sf::TriangleFan),
43       outline_vertices(sf::TriangleStrip), inside_bounds(), bounds(),
44       origin(0, 0), position(0, 0), rotation(0), scale(1, 1), transform(),
45       transform_need_update(true), inverse_transform(),
46       inverse_transform_need_update(true) {}
```

3.8.3 Member Function Documentation

3.8.3.1 draw()

```
void Shape::draw (
            sf::RenderWindow & target,
            sf::RenderStates states = sf::RenderStates::Default ) const  [virtual]
```

Virtual method: Draw the shape on the specified render target.

Parameters

target	The render target (sf::Renderwindow is a typedef of SFML drawing window)
states	The render states to apply (default is sf::RenderStates::Default)

Reimplemented in Text, and Polyline.

Definition at line 79 of file Shape.cpp.

```
79                                                                  {
80     states.transform *= getTransform();
81
82     // Render the inside
83     states.texture = texture;
84     target.draw(vertices, states);
85
86     // Render the outline
87     if (outline_thickness != 0) {
88         states.texture = nullptr;
89         target.draw(outline_vertices, states);
90     }
91 }
```

3.8.3.2 getFillColor()

```
const sf::Color & Shape::getFillColor ( ) const
```

Gets the fill color of the shape.

Returns

The fill color of the shape.

Note

The default fill color is white.

Definition at line 23 of file Shape.cpp.

```
23 { return fill_color; }
```

3.8.3.3 getInverseTransform()

```
const sf::Transform & Shape::getInverseTransform ( ) const
```

Gets the inverse shape transform.

Returns

The inverse shape transform (sf::Transform is a typedef of SFML)

Note

This function returns the inverse of the combined transform of the object.

Definition at line 173 of file Shape.cpp.

```
173                                                 {
174     // Recompute the inverse transform if needed
175     if (inverse_transform_need_update) {
176         inverse_transform = getTransform().getInverse();
177         inverse_transform_need_update = false;
178     }
179
180     return inverse_transform;
181 }
```

3.8.3.4 getOutlineColor()

```
const sf::Color & Shape::getOutlineColor ( ) const
```

Gets the outline color of the shape.

Returns

The outline color of the shape.

Note

The default outline color is white.

Definition at line 30 of file Shape.cpp.

```
30 { return outline_color; }
```

3.8.3.5 getOutlineThickness()

```
float Shape::getOutlineThickness ( ) const
```

Gets the outline thickness of the shape.

Returns

The outline thickness of the shape.

Note

The default outline thickness is 0.

Definition at line 38 of file Shape.cpp.

```
38 { return outline_thickness; }
```

3.8.3.6 getPoint()

```
virtual sf::Vector2f Shape::getPoint (
            std::size_t index ) const  [pure virtual]
```

Virtual method: Get the position of the point on the shape (for Polygon shape)

Parameters

index	The index of the point

Returns

The position of the specified point on the shape

Note

The returned point is in local coordinates, that is, the shape's transforms (position, rotation, scale) are not taken into account.

The result is undefined if index is out of the valid range.

The number of points of the shape is defined by the concrete implementation.

The returned vector is constant, which means that you can't modify its coordinates when you retrieve it.

This is a pure virtual method, so it has to be implemented by the derived class.

Implemented in Rect, Polyline, Ellipse, Text, Polygon, Line, and Circle.

3.8.3.7 getPointCount()

```
virtual std::size_t Shape::getPointCount ( ) const  [pure virtual]
```

Virtual method: Get the number of point of the shape (for Polygon shape)

Returns

The number of points of the shape

Note

This is a pure virtual method, so it has to be implemented by the derived class to define how the shape should be drawn.

Implemented in Rect, Polyline, Text, Polygon, Line, and Circle.

3.8.3.8 getTransform()

```
const sf::Transform & Shape::getTransform ( ) const
```

Gets the shape transform.

Returns

The shape transform (sf::Transform is a typedef of SFML)

Note

This function returns the combined transform of the object.

The transform is a combination of the position, rotation, and scale of the object.

Definition at line 153 of file Shape.cpp.

```
153                                          {
154     // Recompute the combined transform if needed
155     if (transform_need_update) {
156         float angle = -rotation * acos(-1) / 180.f;
157         float cosine = std::cos(angle);
158         float sine = std::sin(angle);
159         float sxc = scale.x * cosine;
160         float syc = scale.y * cosine;
161         float sxs = scale.x * sine;
162         float sys = scale.y * sine;
163         float tx = -origin.x * sxc - origin.y * sys + position.x;
164         float ty = origin.x * sxs - origin.y * syc + position.y;
165 
166         transform = sf::Transform(sxc, sys, tx, -sxs, syc, ty, 0.f, 0.f, 1.f);
167         transform_need_update = false;
168     }
169 
170     return transform;
171 }
```

3.8.3.9 setFillColor()

```
void Shape::setFillColor (
              const sf::Color & color )
```

Sets the fill color of the shape.

Parameters

color	The new fill color of the shape.

Definition at line 18 of file Shape.cpp.

```
18                                                {
19     fill_color = color;
20     updateFillColors();
21 }
```

3.8.3.10 setOutlineColor()

```
void Shape::setOutlineColor (
              const sf::Color & color )
```

Sets the outline color of the shape.

Parameters

color	The new outline color of the shape.

Definition at line 25 of file Shape.cpp.

```
25                                                  {
26     outline_color = color;
27     updateOutlineColors();
28 }
```

3.8.3.11 setOutlineThickness()

```
void Shape::setOutlineThickness (
             float thickness )
```

Sets the outline thickness of the shape.

Parameters

thickness	The new outline thickness of the shape.

Note

If the thickness is negative, the outline will be inside the shape. If the thickness is positive, the outline will be outside the shape. If the thickness is zero, no outline will be drawn.

The default outline thickness is 0.

The outline thickness cannot be greater than the radius of the shape.

Definition at line 32 of file Shape.cpp.

```
32                                                  {
33     outline_thickness = thickness;
34     update();  // recompute everything because the whole shape must be
35                // offset
36 }
```

3.8.3.12 setPosition() [1/2]

```
void Shape::setPosition (
             const sf::Vector2f & position )
```

Sets the position of the shape.

Parameters

position	The new position of the shape (sf::Vector2f is a typedef of coordination in SFML)

Note

The default position of the shape is (0, 0).

The position of the shape is relative to its origin.

Definition at line 190 of file Shape.cpp.

```
190                                                 {
```

```
191     setPosition(position.x, position.y);
192 }
```

3.8.3.13 setPosition() [2/2]

```
void Shape::setPosition (
            float x,
            float y )
```

Sets the position of the shape.

Parameters

x	The x coordinate of the new position
y	The y coordinate of the new position

Note

The default position of the shape is (0, 0).

The position of the shape is relative to its origin.

Definition at line 183 of file Shape.cpp.

```
183                                     {
184     position.x = x;
185     position.y = y;
186     transform_need_update = true;
187     inverse_transform_need_update = true;
188 }
```

3.8.3.14 update()

```
void Shape::update ( )  [protected]
```

Sets the texture of the shape.

Parameters

texture	The new texture of the shape

Note

The texture is not copied, it is referenced by the shape.

The default texture is NULL.

Definition at line 48 of file Shape.cpp.

```
48                      {
49     // Get the total number of points of the shape
50     std::size_t count = getPointCount();
51     if (count < 3) {
```

```
52          vertices.resize(0);
53          outline_vertices.resize(0);
54          return;
55      }
56
57      vertices.resize(count + 2);  // + 2 for center and repeated first point
58
59      // Position
60      for (std::size_t i = 0; i < count; ++i)
61          vertices[i + 1].position = getPoint(i);
62      vertices[count + 1].position = vertices[1].position;
63
64      // Update the bounding rectangle
65      vertices[0] = vertices[1];  // so that the result of getBounds() is correct
66      inside_bounds = vertices.getBounds();
67
68      // Compute the center and make it the first vertex
69      vertices[0].position.x = inside_bounds.left + inside_bounds.width / 2;
70      vertices[0].position.y = inside_bounds.top + inside_bounds.height / 2;
71
72      // Color
73      updateFillColors();
74
75      // Outline
76      updateOutline();
77  }
```

3.8.3.15 updateFillColors()

```
void Shape::updateFillColors ( )  [private]
```

Updates the fill colors of the shape.

Note

This method call the update() method.

Definition at line 93 of file Shape.cpp.

```
93                                  {
94      for (std::size_t i = 0; i < vertices.getVertexCount(); ++i)
95          vertices[i].color = fill_color;
96  }
```

3.8.3.16 updateOutline()

```
void Shape::updateOutline ( )  [private]
```

Updates the outline of the shape.

Note

This method call the update() method.

Definition at line 98 of file Shape.cpp.

```
98                          {
99     // Return if there is no outline
100     if (outline_thickness == 0.f) {
101         outline_vertices.clear();
102         bounds = inside_bounds;
103         return;
104     }
105
106     std::size_t count = vertices.getVertexCount() - 2;
107     outline_vertices.resize((count + 1) * 2);
108
109     for (std::size_t i = 0; i < count; ++i) {
110         std::size_t index = i + 1;
111
112         // Get the two segments shared by the current point
113         sf::Vector2f p0 =
114             (i == 0) ? vertices[count].position : vertices[index - 1].position;
115         sf::Vector2f p1 = vertices[index].position;
116         sf::Vector2f p2 = vertices[index + 1].position;
117
118         // Compute their normal
119         sf::Vector2f n1 = computeNormal(p0, p1);
120         sf::Vector2f n2 = computeNormal(p1, p2);
121
122         // Make sure that the normals point towards the outside of the shape
123         // (this depends on the order in which the points were defined)
124         if (dotProduct(n1, vertices[0].position - p1) > 0) n1 = -n1;
125         if (dotProduct(n2, vertices[0].position - p1) > 0) n2 = -n2;
126
127         // Combine them to get the extrusion direction
128         float factor = 1.f + (n1.x * n2.x + n1.y * n2.y);
129         sf::Vector2f normal = (n1 + n2) / factor;
130
131         // Update the outline points
132         sf::Vector2f offset = normal * (outline_thickness / 2.f);
133         outline_vertices[i * 2 + 0].position = p1 - offset;
134         outline_vertices[i * 2 + 1].position = p1 + offset;
135     }
136
137     // Duplicate the first point at the end, to close the outline
138     outline_vertices[count * 2 + 0].position = outline_vertices[0].position;
139     outline_vertices[count * 2 + 1].position = outline_vertices[1].position;
140
141     // Update outline colors
142     updateOutlineColors();
143
144     // Update the shape's bounds
145     bounds = outline_vertices.getBounds();
146 }
```

3.8.3.17 updateOutlineColors()

```
void Shape::updateOutlineColors ( )  [private]
```

Updates the outline colors of the shape.

Note

This method call the update() method.

Definition at line 148 of file Shape.cpp.

```
148                                 {
149     for (std::size_t i = 0; i < outline_vertices.getVertexCount(); ++i)
150         outline_vertices[i].color = outline_color;
151 }
```

The documentation for this class was generated from the following files:

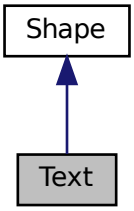
- src/graphics/Shape.hpp
- src/graphics/Shape.cpp

3.9 Text Class Reference

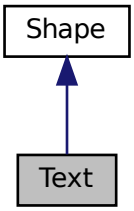
Represents text in 2D space.

`#include <Text.hpp>`

Inheritance diagram for Text:



Collaboration diagram for Text:



Public Member Functions

- Text (sf::Vector2f pos, sf::String TEXT, sf::Color fill_color=sf::Color::Black, float font_size=1)

  Constructs a Text object.
- virtual std::size_t getPointCount () const

  Gets the total number of points representing the text.
- virtual sf::Vector2f getPoint (std::size_t index) const

  Gets a dummy point for compatibility with Shape interface.
- void draw (sf::RenderWindow &target, sf::RenderStates states=sf::RenderStates::Default) const

  Draws the text on the specified render target.

Static Public Attributes

- static sf::Font font

  Static font shared across all Text instances.

Private Attributes

- sf::Text text

  Text element.

Additional Inherited Members

3.9.1 Detailed Description

Represents text in 2D space.

The Text class is derived from the Shape class and defines a text element with a specified position, string, fill color, and font size.

Definition at line 12 of file Text.hpp.

3.9.2 Constructor & Destructor Documentation

3.9.2.1 Text()

```
Text::Text (
             sf::Vector2f pos,
             sf::String TEXT,
             sf::Color fill_color = sf::Color::Black,
             float font_size = 1 )
```

Constructs a Text object.

Parameters

pos	The position of the text.
TEXT	The string of the text.
fill_color	The fill color of the text (default is sf::Color::Black).
font_size	The font size of the text (default is 1).

Definition at line 7 of file Text.cpp.

```
8                                {
9      text.setPosition(pos);
10      text.setFont(font);
11      text.setCharacterSize(font_size);
12      text.setFillColor(fill_color);
13      text.setString(TEXT);
14  }
```

3.9.3 Member Function Documentation

3.9.3.1 draw()

```
void Text::draw (
            sf::RenderWindow & target,
            sf::RenderStates states = sf::RenderStates::Default ) const  [virtual]
```

Draws the text on the specified render target.

Parameters

target	The render target to draw on.
states	The render states to apply (default is sf::RenderStates::Default).

Reimplemented from Shape.

Definition at line 21 of file Text.cpp.

```
21                                                          {
22     target.draw(this->text);
23 }
```

3.9.3.2 getPoint()

```
sf::Vector2f Text::getPoint (
            std::size_t index ) const  [virtual]
```

Gets a dummy point for compatibility with Shape interface.

Since text is not represented by points, this method always returns (0, 0).

Parameters

index	The index of the dummy point (ignored).

Returns

A dummy point for compatibility.

Implements Shape.

Definition at line 17 of file Text.cpp.

```
17                                                  {
18     return sf::Vector2f(0, 0);
19 }
```

3.9.3.3 getPointCount()

```
std::size_t Text::getPointCount ( ) const  [virtual]
```

Gets the total number of points representing the text.

Since text is not represented by points, this method always returns 0.

Returns

The number of points representing the text.

Implements Shape.

Definition at line 15 of file Text.cpp.

```
15 { return 0; }
```

The documentation for this class was generated from the following files:

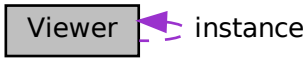
- src/graphics/Text.hpp
- src/graphics/Text.cpp

3.10 Viewer Class Reference

Represents a viewer for handling events and interactions with an SFML window.

```
#include <Viewer.hpp>
```

Collaboration diagram for Viewer:



Public Member Functions

- void handleEvents (sf::Event event)

  Handles SFML events.
- void handleDragging ()

  Handles dragging interaction.
- void operator= (const Viewer &)=delete

  Deleted assignment operator to prevent copying of Viewer instances.
- Viewer (const Viewer &)=delete

  Deleted copy constructor to prevent copying of Viewer instances.

Static Public Member Functions

- static Viewer * getInstance (sf::RenderWindow &Window, sf::View &View)

  Gets the singleton instance of Viewer.

Private Member Functions

- Viewer (sf::RenderWindow &Window, sf::View &View)

  Constructs a Viewer object.
- void zoom (float factor)

  Zooms the view by the specified factor.
- void rotate (float angle)

  Rotates the view by the specified angle.
- void startDragging ()

  Starts dragging the view.
- void stopDragging ()

  Stops dragging the view.
- void moveView (const sf::Vector2f &offset)

  Moves the view by the specified offset.

Private Attributes

- sf::RenderWindow & window

  Reference to the SFML window.
- sf::View & view

  Reference to the SFML view.
- sf::Vector2i last_mouse_position

  Last recorded mouse position.
- bool is_mouse_dragging

  Flag indicating whether mouse dragging is active.

Static Private Attributes

- static Viewer * instance = nullptr

  Singleton instance of Viewer.

3.10.1 Detailed Description

Represents a viewer for handling events and interactions with an SFML window.

The Viewer class is responsible for handling events, such as zooming, rotating, and dragging, to interact with an SFML window and view.

Definition at line 13 of file Viewer.hpp.

3.10.2 Constructor & Destructor Documentation

3.10.2.1 Viewer()

```
Viewer::Viewer (
            sf::RenderWindow & Window,
            sf::View & View )  [private]
```

Constructs a Viewer object.

Parameters

Window	The SFML window to associate with the viewer.
View	The SFML view to associate with the viewer.

Definition at line 12 of file Viewer.cpp.

```
13     : window(Window), view(View) {}
```

3.10.3 Member Function Documentation

3.10.3.1 getInstance()

```
Viewer * Viewer::getInstance (
            sf::RenderWindow & Window,
            sf::View & View )  [static]
```

Gets the singleton instance of Viewer.

Parameters

Window	The SFML window to associate with the viewer.
View	The SFML view to associate with the viewer.

Returns

The singleton instance of Viewer.

Definition at line 5 of file Viewer.cpp.

```
5                                                                    {
6     if (instance == nullptr) {
7         instance = new Viewer(Window, View);
8     }
9     return instance;
10 }
```

3.10.3.2 handleEvents()

```
void Viewer::handleEvents (
            sf::Event event )
```

Handles SFML events.

Parameters

event	The SFML event to handle.

Definition at line 15 of file Viewer.cpp.

```
15                                      {
16     if (event.type == sf::Event::Closed) {
17         window.close();
18     }
19
20     // Zoom in by + (including '=' key)
21     if ((event.type == sf::Event::KeyPressed &&
22          event.key.code == sf::Keyboard::Add) ||
23         (event.type == sf::Event::KeyPressed &&
24          event.key.code == sf::Keyboard::Equal)) {
25         zoom(0.9f);
26     }
27
28     // Zoom out by - (including '-' key)
29     if ((event.type == sf::Event::KeyPressed &&
30          event.key.code == sf::Keyboard::Subtract) ||
31         (event.type == sf::Event::KeyPressed &&
32          event.key.code == sf::Keyboard::Hyphen)) {
33         zoom(1.1f);
34     }
35
36     // Rotate clockwise by 'R' key
37     if (event.type == sf::Event::KeyPressed &&
38         event.key.code == sf::Keyboard::R) {
39         rotate(90.0f);
40     }
41
42     // Rotate anti-clockwise by 'E' key
43     if (event.type == sf::Event::KeyPressed &&
44         event.key.code == sf::Keyboard::E) {
45         rotate(-90.0f);
46     }
47
48     // Zoom in/out with mouse scroll
49     if (event.type == sf::Event::MouseWheelScrolled) {
50         if (event.mouseWheelScroll.wheel == sf::Mouse::VerticalWheel) {
51             if (event.mouseWheelScroll.delta > 0) {
52                 zoom(0.9f);
53             } else {
54                 zoom(1.1f);
55             }
56         }
57     }
58
59     // Zoom in/out with touchpad (control pad)
60     if (event.type == sf::Event::TouchMoved) {
61         // Assuming that touchpad input scales the zoom based on movement
62         float delta = event.touch.y;
63         if (delta > 0) {
64             zoom(0.9f);
65         } else {
66             zoom(1.1f);
67         }
68     }
69
70     // Start dragging the left mouse button
71     if (event.type == sf::Event::MouseButtonPressed &&
72         event.mouseButton.button == sf::Mouse::Left) {
73         startDragging();
74     }
75
76     // Finish dragging the left mouse button
77     if (event.type == sf::Event::MouseButtonReleased &&
78         event.mouseButton.button == sf::Mouse::Left) {
79         stopDragging();
80     }
81 }
```

3.10.3.3 moveView()

```
void Viewer::moveView (
            const sf::Vector2f & offset )  [private]
```

Moves the view by the specified offset.

Parameters

offset	The offset by which to move the view.

Definition at line 110 of file Viewer.cpp.

```
110                                          {
111     view.move(-offset);
112     window.setView(view);
113 }
```

3.10.3.4 rotate()

```
void Viewer::rotate (
            float angle )  [private]
```

Rotates the view by the specified angle.

Parameters

angle	The rotation angle.

Definition at line 98 of file Viewer.cpp.

```
98                                {
99     view.rotate(angle);
100     window.setView(view);
101 }
```

3.10.3.5 zoom()

```
void Viewer::zoom (
            float factor )  [private]
```

Zooms the view by the specified factor.

Parameters

factor	The zoom factor.

Definition at line 93 of file Viewer.cpp.

```
93                                {
94     view.zoom(factor);
95     window.setView(view);
96 }
```

3.10.4 Member Data Documentation

3.10.4.1 is_mouse_dragging

```
bool Viewer::is_mouse_dragging  [private]
```

Initial value:

```
=
       false
```

Flag indicating whether mouse dragging is active.

Definition at line 60 of file Viewer.hpp.

The documentation for this class was generated from the following files:

- src/Viewer.hpp
- src/Viewer.cpp

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