1_SVG_converter_Plus

January 16, 2021

In [93]:
```
from svg.path import parse_path
from svg.path.path import Line
from xml.dom import minidom
import numpy as np
import matplotlib.pyplot as plt

# Learned from
# https://python5.com/q/twovjmxc
```

In [54]:
```
# read the SVG file
doc = minidom.parse('B_sample.svg')
path_strings = [path.getAttribute('d') for path
                in doc.getElementsByTagName('path')]
doc.unlink()
```

In [55]:
```
path_strings
```

Out[55]:
```
['M108,63c0,0,35.157,0,56.25,0s42.188,29.25,56.25,58.5  s35.156,58.5,56.25,58.5s56.25
```

In [56]:
```
path_strings[0]
```

Out[56]:
```
'M108,63c0,0,35.157,0,56.25,0s42.188,29.25,56.25,58.5  s35.156,58.5,56.25,58.5s56.25,
```

In [57]:
```
parse_path(path_strings[0])
```

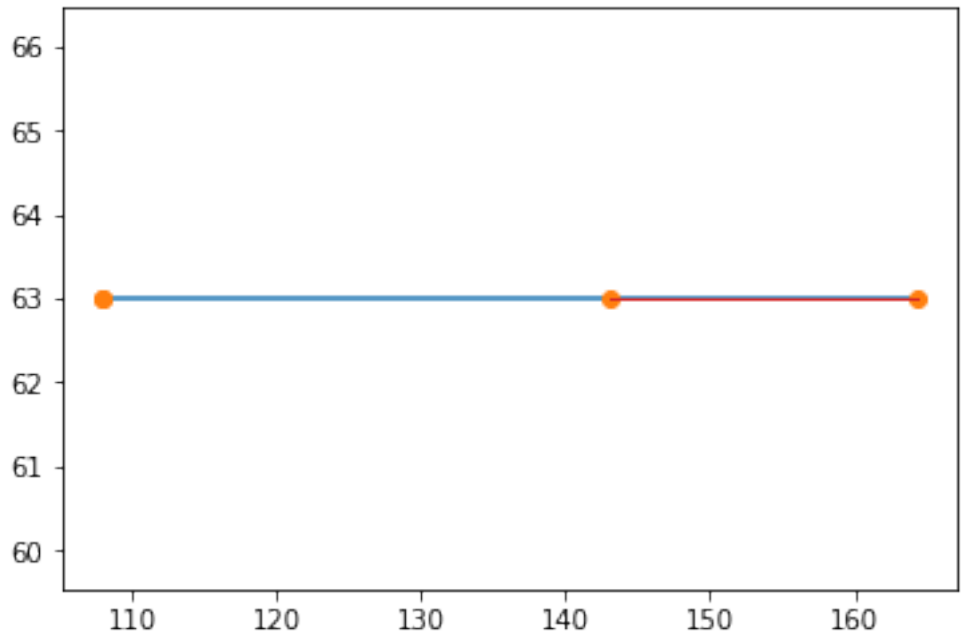
Out[57]:
```
Path(Move(to=(108+63j)), CubicBezier(start=(108+63j), control1=(108+63j), control2=(14
```

In [59]:
```
for path_string in path_strings:
    path = parse_path(path_string)
    for e in path:
        if type(e).__name__ == 'Line':
            x0 = e.start.real
            y0 = e.start.imag
            x1 = e.end.real
            y1 = e.end.imag
            print("(%.2f, %.2f) - (%.2f, %.2f)" % (x0, y0, x1, y1))
```

In [61]:
```
path=parse_path(path_strings[0])
key=0
path[key]
```

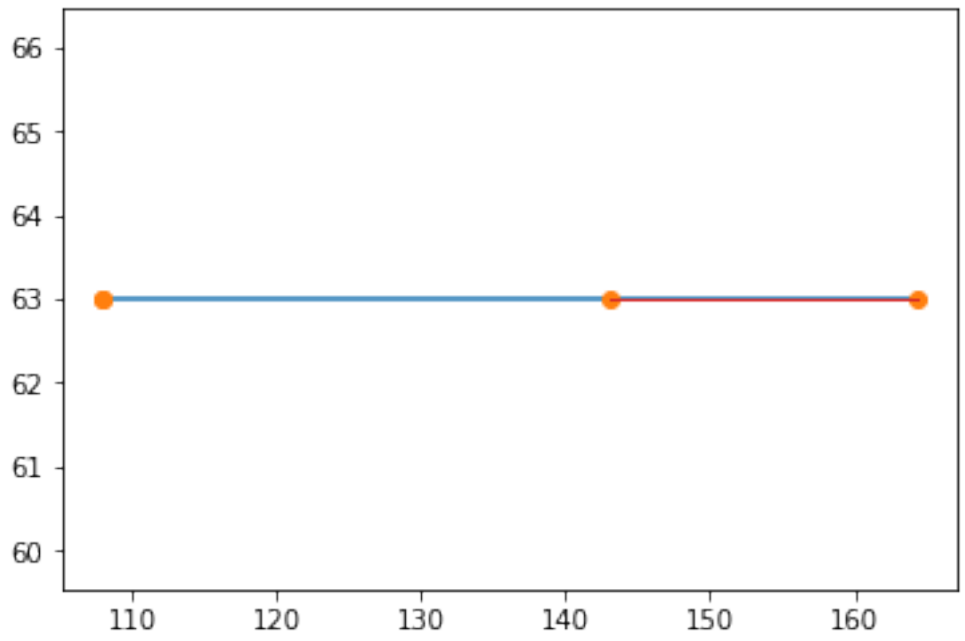
```
Out[61]: Move(to=(108+63j))

In [62]: type(path[key]).__name__

Out[62]: 'Move'

In [63]: path[key].start.real

Out[63]: 108.0

In [64]: path[key].start.imag

Out[64]: 63.0

In [65]: key=1
         path[key]

Out[65]: CubicBezier(start=(108+63j), control1=(108+63j), control2=(143.15699999999998+63j), en

In [66]: type(path[key]).__name__

Out[66]: 'CubicBezier'

In [67]: path[key].start.real

Out[67]: 108.0

In [68]: path[key].start.imag

Out[68]: 63.0

In [72]: def cubic_bezier_converter(start, control1, control2, end):
             original_data = np.array([start, control1, control2, end])
             cubic_bezier_matrix = np.array([
                 [-1,  3, -3,  1],
                 [ 3, -6,  3,  0],
                 [-3,  3,  0,  0],
                 [ 1,  0,  0,  0]
             ])
             return_data = cubic_bezier_matrix.dot(original_data)

             return (lambda t: np.array([t**3, t**2, t, 1]).dot(return_data))

         # Learned from
         # https://stackoverflow.com/questions/36971363/how-to-interpolate-svg-path-into-a-pix

In [83]: block=0
         n_dots=100
         key=0

         path=parse_path(path_strings[block])
```

```
dat=path[key]numpy.linalg.norm(u)
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_n
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```



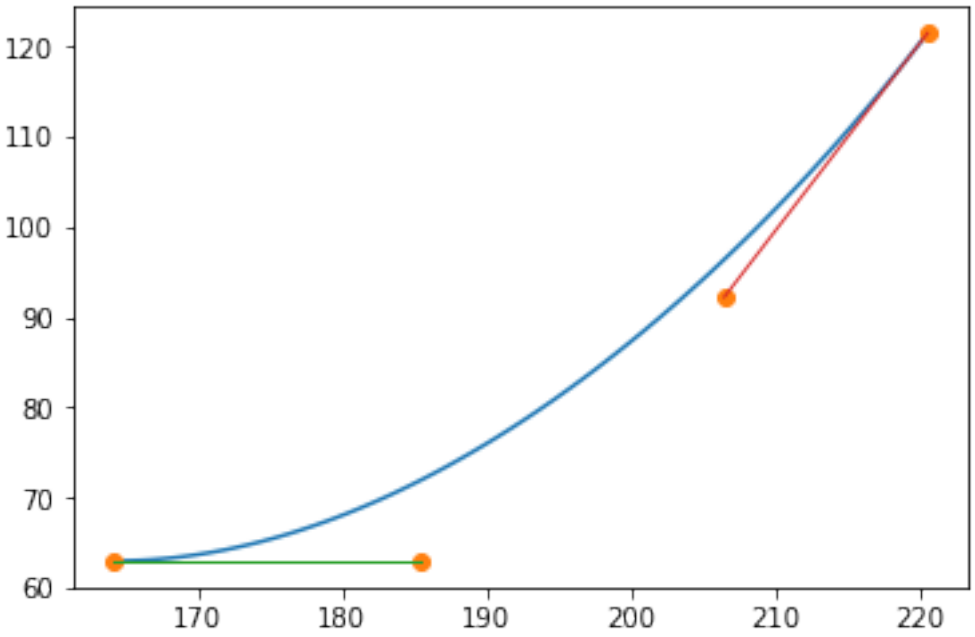
In [84]:
```
block=0
n_dots=100
key=1
```

```
path=parse_path(path_strings[block])

dat=path[key]
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_n
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```



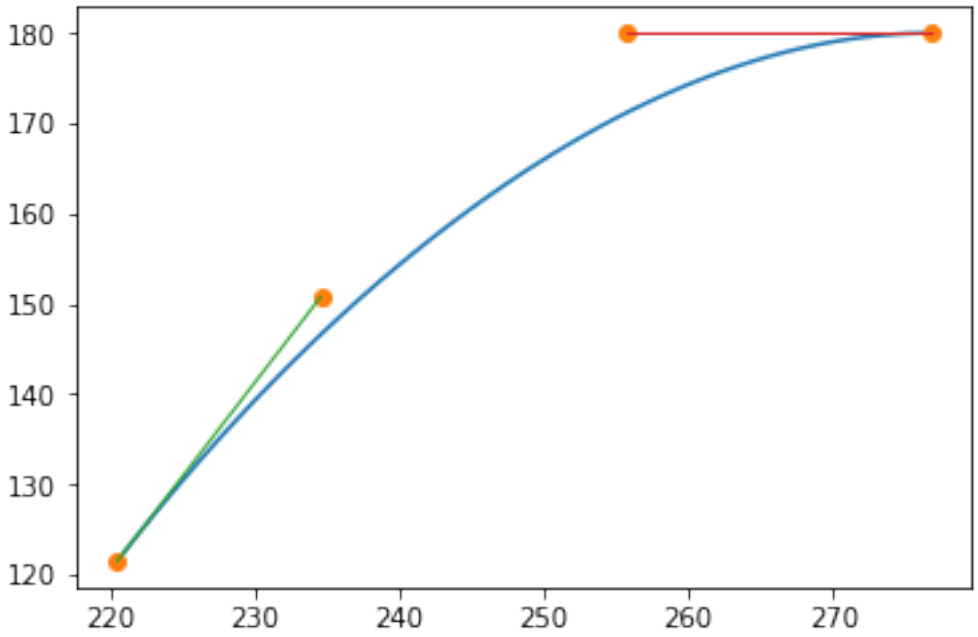
In [85]:
```
block=0
n_dots=100
key=2
```

```
path=parse_path(path_strings[block])

dat=path[key]
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```



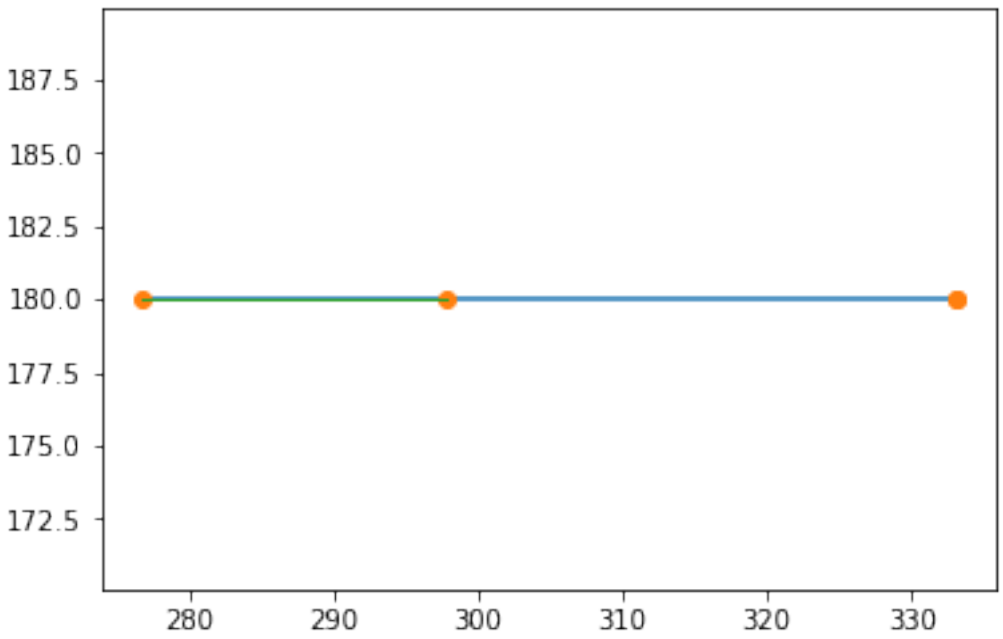
In [86]:
```
block=0
n_dots=100
```

```
key=3

path=parse_path(path_strings[block])

dat=path[key]
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```

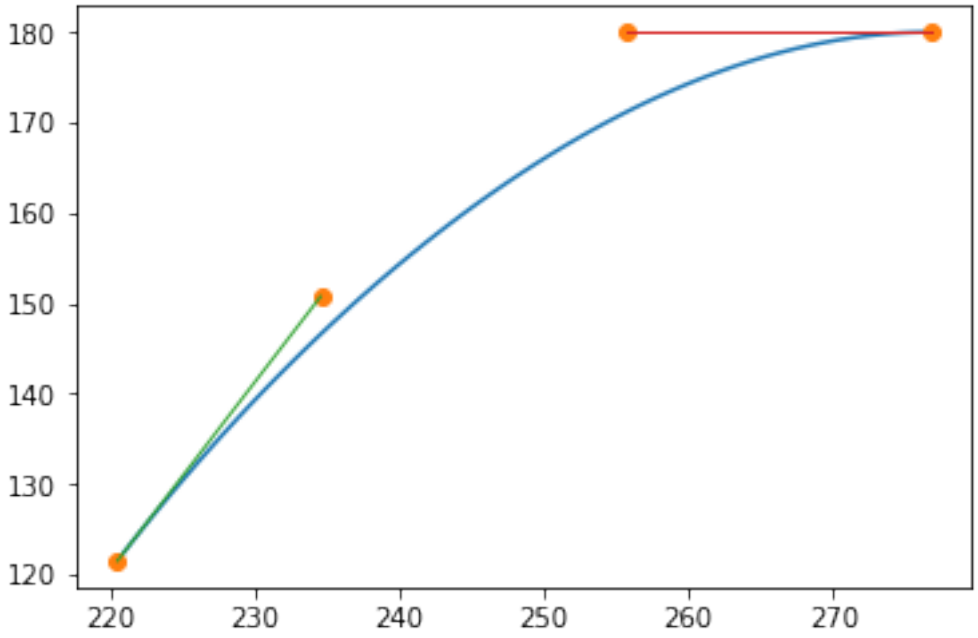


In [87]: block=0

```
n_dots=100
key=4

path=parse_path(path_strings[block])

dat=path[key]
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```



In [98]:
```
diff_np=start_np-end_np
n_dots=np.round(np.linalg.norm(diff_np))

block=0
n_dots=100
key=3

path=parse_path(path_strings[block])

dat=path[key]
if type(path[key]).__name__=='CubicBezier':
    start_np = np.array([dat.start.real, dat.start.imag])
    control1_np = np.array([dat.control1.real, dat.control1.imag])
    control2_np = np.array([dat.control2.real, dat.control2.imag])
    end_np = np.array([dat.end.real, dat.end.imag])
    converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np, end_
    points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)])

# == plot the line==
controls_np = np.array([start_np, control1_np, control2_np, end_np])
#  curve drawing
plt.plot(points_np[:, 0], points_np[:, 1], '-')
# showing of control points
plt.plot(controls_np[:,0], controls_np[:,1], 'o')
#  control line drawing
plt.plot([start_np[0], control1_np[0]], [start_np[1], control1_np[1]], '-', lw=1)
plt.plot([control2_np[0], end_np[0]], [control2_np[1], end_np[1]], '-', lw=1)

plt.show()
```



In [ ]: