```html
<!DOCTYPE html>
<html>
    <head>
        <meta charset="utf-8">
        <title>Enjoy Mandelbrot Fractals</title>

        <script>

        //global variables
        var xmin = -2.0; var xmax = 0.5;   //2.5 units in x direction corresponding to 1000
        var ymin = -1.0; var ymax = 1.0;   //2.0 units in y direction corresponding to 800
        var callNumber = 0;                //number of calls to showMandel
        var magnification = 1;
        var currentColor = "random";
        var red = "red";
        var random = "random";

        function changeCurrentColor()
        {
          if (document.getElementById("changeColorRandom").checked)
            currentColor = "random";
          else if (document.getElementById("changeColorRed").checked)
            currentColor = "red";
          else if (document.getElementById("changeColorBlue").checked)
            currentColor = "blue";
          else if (document.getElementById("changeColorGreen").checked)
            currentColor = "green";
          else if (document.getElementById("changeColorPurple").checked)
            currentColor = "purple";
          else if (document.getElementById("changeColorOrange").checked)
            currentColor = "orange";

          Reset()

          //debug print
          var color = " currentColor: " + currentColor;
          document.getElementById("currentColor").innerHTML = color;
        }

        function Reset()
        {
          xmin = -2.0
          xmax =  0.5;
          ymin = -1.0;
          ymax =  1.0;
          callNumber = 0;
          magnification = 1;
          showMandel(0,0)
        }

        function getCoordsAndShowMandel(event)
        {
          var x = event.clientX;
          var y = event.clientY;

          //debug print
          //var coords = "X coord: " + x + ", Y coord: " + y;
          //document.getElementById("mouseCoords").innerHTML = coords;

          showMandel(x,y)
        }

        function setColorAndShowMandel(color)
```

```
{
  currentColor = color;
  if (currentColor == "")
    currentColor = "random"

  //debug print
  var color = " currentColor: " + currentColor;
  document.getElementById("currentColor").innerHTML = color;

  showMandel(0,0)
}

function showMandel(xmouse, ymouse)
{
var canvas = document.getElementById('canvas');
var context = canvas.getContext('2d');
var xr = context.canvas.width;
var yr = context.canvas.height;
var imgd = context.createImageData(xr, yr);
var pix = imgd.data;

//set new xmin, xmax, ymin, ymax based on mouse coordinates
callNumber = callNumber + 1;
if (callNumber != 1)
{
  //fudge xmouse & ymouse if not the initial showMandel
  xmouse = xmouse - 10
  ymouse = ymouse - 20

  magnification = magnification * 1.5
  xrange = xmax - xmin
  yrange = ymax - ymin
  xcenter = xmin + xmouse/1000. * xrange
  ycenter = ymin + ymouse/800.  * yrange
  xmin = xcenter - xrange/(2 * magnification)
  xmax = xcenter + xrange/(2 * magnification)
  ymin = ycenter - yrange/(2 * magnification)
  ymax = ycenter + yrange/(2 * magnification)

  //debug print
  //var coords = "xcenter: " + xcenter + ", ycenter: " + ycenter
  //           + ", xmin: " + xmin + ", xmax: " + xmax
  //           + ", ymin: " + ymin + ", ymax: " + ymax;
  //document.getElementById("xyLimits").innerHTML = coords;
}


//coloring the image
var mr0 = 0; var mg0 = 0; var mb0 = 0;

if (currentColor == "random")
{
  while(mr0 == mg0 || mr0 == mb0 || mg0 == mb0)
  {
    mr0 = Math.pow(2, Math.ceil(Math.random() * 3 + 3));   //8,16,32 or 64
    mg0 = Math.pow(2, Math.ceil(Math.random() * 3 + 3));
    mb0 = Math.pow(2, Math.ceil(Math.random() * 3 + 3));
  }
}
else if (currentColor == "red")
{
  mr0 = 8;
  mg0 = 64;
```

```
    mb0 = 64;
}
else if (currentColor == "blue")
{
   //blue mr0 = 64; mg0 = 64; mb0 = 8;
   //light blue
   mr0 = 64;
   mg0 = 8;
   mb0 = 8;
}
else if (currentColor == "green")
{
   mr0 = 32;
   mg0 = 16;
   mb0 = 64;
}
else if (currentColor == "purple")
{
   mr0 = 8;
   mg0 = 64;
   mb0 = 8;
}
else if (currentColor == "orange")
{
   mr0 = 16;
   mg0 = 32;
   mb0 = 64;
}

//yellow mr0 = 8;  mg0 = 8;  mb0 = 64;

var mr1 = 256 / mr0; var mg1 = 256 / mg0; var mb1 = 256 / mb0;

//debug print
//var rgb = "  mr0: " + mr0 + ", mr1: " + mr1
//          + ", mg0: " + mg0 + ", mg1: " + mg1
//          + ", mb0: " + mb0 + ", mb1: " + mb1;
//document.getElementById("rgbValues").innerHTML = rgb;

var maxIt = 256;
var x = 0.0; var y = 0.0;
var zx = 0.0; var zx0 = 0.0; var zy = 0.0;
var zx2 = 0.0; var zy2 = 0.0;

for (var ky = 0; ky < yr; ky++)                       //800 y values
{
    y = ymin + (ymax - ymin) * ky / yr;
    for(var kx = 0; kx < xr; kx++)                    //1000 x values
    {
        x = xmin + (xmax - xmin) * kx / xr;
        zx = x; zy = y;
        for(var i = 0; i < maxIt; i++)
        {
            zx2 = zx * zx; zy2 = zy * zy;
            if(zx2 + zy2 > 4.0) break;        //not bounded, not in mandelbrot set
            zx0 = zx2 - zy2 + x;
            zy = 2.0 * zx * zy + y;
            zx = zx0;
        }
        var p = (xr * ky + kx) * 4;   //4 pixels per x,y coord
        pix[p]     = i % mr0 * mr1;   //red @ remainder(nr iterations/mr0) * mr1
        pix[p + 1] = i % mg0 * mg1;   //green
        pix[p + 2] = i % mb0 * mb1;   //blue
```

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                pix[p + 3] = 255;                   //alpha = transparency, 0=transparent
            }
        }

        context.putImageData(imgd, 0, 0);

        }

    </script>
  </head>

<!-- ************************************* HTML ************************************* -->

    <body onload="setColorAndShowMandel({{ user.profile.color|default:"none" }})">
                <!-- onload="showMandel(0,0)"> -->

        <p onclick="getCoordsAndShowMandel(event)">
          <canvas id="canvas" width="1000" height="800">
          </canvas>
        </p>

        <!-- used for debug printing -->
        <p id="mouseCoords"></p>
        <p id="xyLimits"></p>
        <p id="rgbValues"></p>
        <p id="currentColor"></p>

        <button type="button" onclick="Reset()">Reset to No Zoom</button>

        <a href="/code/"><button>View Code</button></a>

        {% if user.is_staff %}
          <a href="/admin/"><button>Admin</button></a>
        {% endif %}

        <br />
        <br />

        {# {% tag %}  and {{ variable }} is Django template language #}

        {% if user.is_authenticated %}
          <script>
            var color = "{{user.profile.color}}"
            setColorAndShowMandel(color)
          </script>

          USERNAME:  {{ user.username }}
                  
          <br /><br />
          CURRENT PROFILE COLOR:  {{ user.profile.color|default:"none" }}
                  
          <br /><br />
          SELECT NEW PROFILE COLOR: 

          <form action="/color/" method="POST" style="display: inline;">
            {% csrf_token %}

            <input type="radio" name="changeColor" id="changeColorRandom"
                   onclick="changeCurrentColor()"  value="random">random
            <input type="radio" name="changeColor" id="changeColorRed"
                   onclick="changeCurrentColor()"  value="red"   >red
            <input type="radio" name="changeColor" id="changeColorBlue"
                   onclick="changeCurrentColor()"   value="blue"  >blue
```

```html
        <input type="radio" name="changeColor" id="changeColorGreen"
               onclick="changeCurrentColor()"  value="green" >green
        <input type="radio" name="changeColor" id="changeColorPurple"
               onclick="changeCurrentColor()"  value="purple">purple
        <input type="radio" name="changeColor" id="changeColorOrange"
               onclick="changeCurrentColor()"  value="orange">orange

          THEN CLICK: 

        <input type="submit" value="CHANGE PROFILE" />
      </form>

      <br /><br />

      <a href = "/accounts/logout/">Logout</a>
    {% else %}
      <script>
        setColorAndShowMandel(random)
      </script>

      <a href = "/accounts/login/">Login</a>
    {% endif %}

    <main>
      {% block content %}
      {% endblock %}
    </main>

  </body>
</html>
```