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CSC 1051

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Project 8:  Art!

## SOURCE CODE:  Art.java

```
//*********************************************************************************************
// Art.java      Author: Nick Langan
// Created:  November 7, 2018
// Modified: November 11-13, 2018
//
// Using the features of the JavaFX package, this program creates a map of the Villanova campus
// with appropriate labels.  Buildings and roads were drawn with lines and ellipses.  Sections on campus
// were placed into appropriate groups.  Text was used to label the buildings, roads, and create a map legend.
// The ImageView component was used to inset images displaying people, road symbols, and the logos for SEPTA
and Villanova.
//*********************************************************************************************

import java.io.FileInputStream;
import java.io.FileNotFoundException;
import javafx.application.Application;
import javafx.stage.Stage;
import javafx.scene.Group;
import javafx.scene.Scene;
import javafx.scene.paint.Color;
import javafx.scene.shape.*;
import javafx.scene.text.Text;
import javafx.scene.image.Image;
import javafx.scene.image.ImageView;
import java.util.*;

public class Art extends Application
{
   //--------------------------------------------------------------------
   // Villanova map is introduced.  File not found exception occurs if file used in ImageView does not exist.
   //--------------------------------------------------------------------
   public void start(Stage primaryStage)  throws FileNotFoundException
   {
      Random rand = new Random();

   //--------------------------------------------------------------------
   // Defined colors for the map are introduced.
   //--------------------------------------------------------------------
```

```java
    Color railroad = Color.rgb(222, 184, 135), lightGreen = Color.rgb(51, 255, 153), darkBlue = Color.rgb(0, 0,
204),
    novaBlue = Color.rgb(0, 32, 91), novaLightBlue = Color.rgb(19, 181, 234);


    //-------------------------------------------------------------------
    // Line and label for Lancaster Avenue is created.
    //-------------------------------------------------------------------
    Line lancasterAve = new Line (0, 740, 1280, 855);
    lancasterAve.setStrokeWidth(20);
    Text lancasterName = new Text(150, 805, "Lancaster Avenue");
    lancasterName.setFill(Color.WHITE);
    lancasterName.setStyle("-fx-font: 20 arial;");
    lancasterName.setRotate(5);

    //-------------------------------------------------------------------
    // Line for the Blue Route is created.
    //-------------------------------------------------------------------
    Line blueRoute = new Line (0, 300, 150, 0);
    blueRoute.setStrokeWidth(50);

    //-------------------------------------------------------------------
    // Line and label for Spring Mill Road is created.
    //-------------------------------------------------------------------
    Line springMill = new Line (0, 800, 600, 0);
    springMill.setStrokeWidth(10);
    Text springMillName = new Text(200, 505, "Spring Mill Road");
    springMillName.setFill(Color.WHITE);
    springMillName.setStyle("-fx-font: 16 arial;");
    springMillName.setRotate(-50);

    //-------------------------------------------------------------------
    // Line and label for Ithan Avenue is created.
    //-------------------------------------------------------------------
    Line ithan = new Line (700, 1024, 1280, 280);
    ithan.setStrokeWidth(10);
    Text ithanName = new Text(1010, 545, "Ithan Avenue");
    ithanName.setFill(Color.WHITE);
    ithanName.setStyle("-fx-font: 16 arial;");
    ithanName.setRotate(-50);

    //-------------------------------------------------------------------
    // Line and label for County Line Road is created.
    //-------------------------------------------------------------------
    Line countyLine = new Line (300, 0, 1280, 490);
    countyLine.setStrokeWidth(10);
    Text countyLineName = new Text(525, 180, "County Line Road");
    countyLineName.setFill(Color.WHITE);
    countyLineName.setStyle("-fx-font: 16 arial;");
    countyLineName.setRotate(28);

    //-------------------------------------------------------------------
    // Line and label for SEPTA Paoli-Thorndale line is created.
    //-------------------------------------------------------------------
    Line paoliThorndale = new Line (0, 240, 1280, 450);
    paoliThorndale.setStrokeWidth(8);
```

```
        paoliThorndale.setStroke(railroad);
        Text paoliThorndaleName = new Text(540, 380, "Paoli-Thorndale Line");
        paoliThorndaleName.setFill(Color.WHITE);
        paoliThorndaleName.setStyle("-fx-font: 20 arial;");
        paoliThorndaleName.setRotate(8);

    //-------------------------------------------------------------------
    // A group containing the roads and their labels is created.
    //-------------------------------------------------------------------
        Group roads = new Group(countyLine, countyLineName, ithan, ithanName, paoliThorndale,
paoliThorndaleName,
        lancasterAve, lancasterName, blueRoute, springMill, springMillName);

    //-------------------------------------------------------------------
    // An ImageView representing the St. Thomas of Villanova Church is produced.
    //-------------------------------------------------------------------
        Image churchImg = new Image(new FileInputStream("villanovaChurch.png")); //Villanova church image
filename
        ImageView villanovaChurch = new ImageView(churchImg);
        villanovaChurch.setX(440);
        villanovaChurch.setY(610);

    //-------------------------------------------------------------------
    // A group containing the Villanova church image is created.
    //-------------------------------------------------------------------
        Group church = new Group(villanovaChurch);

    //-------------------------------------------------------------------
    // Rectangle represents CEER (label #12)
    //-------------------------------------------------------------------
        Rectangle ceer = new Rectangle (230, 630, 60, 30);
        ceer.setRotate(10);
        ceer.setFill(lightGreen);
        Text ceerName = new Text(247, 655, "12");
        ceerName.setStyle("-fx-font: 22 arial;");
        ceerName.setRotate(10);

    //-------------------------------------------------------------------
    // Rectangle represents Chemical Engineering Building (label #10)
    //-------------------------------------------------------------------
        Rectangle chemEngineering = new Rectangle (300, 510, 20, 50);
        chemEngineering.setRotate(40);
        chemEngineering.setFill(lightGreen);
        Text chemName = new Text(300, 540, "10");
        chemName.setStyle("-fx-font: 18 arial;");
        chemName.setRotate(40);

    //-------------------------------------------------------------------
    // Rectangle represents John Barry Hall (label #9)
    //-------------------------------------------------------------------
        Rectangle johnBarry = new Rectangle (350, 440, 30, 55);
        johnBarry.setRotate(40);
        johnBarry.setFill(lightGreen);
        Text johnBarryName = new Text(360, 470, "9");
        johnBarryName.setStyle("-fx-font: 22 arial;");
        johnBarryName.setRotate(40);
```

```
//---------------------------------------------------------------------
// Rectangle represents White Hall (label #11)
//---------------------------------------------------------------------
    Rectangle whiteHall = new Rectangle (350, 530, 20, 50);
    whiteHall.setRotate(-40);
    whiteHall.setFill(lightGreen);
    Text whiteName = new Text(350, 560, "11");
    whiteName.setStyle("-fx-font: 17 arial;");
    whiteName.setRotate(-40);


//---------------------------------------------------------------------
// Rectangle represents Tollentine Hall (label #13)
//---------------------------------------------------------------------
    Rectangle tollentine = new Rectangle (320, 650, 60, 30);
    tollentine.setRotate(10);
    tollentine.setFill(lightGreen);
    Text tollentineName = new Text(335, 670, "13");
    tollentineName.setStyle("-fx-font: 22 arial;");
    tollentineName.setRotate(10);


//---------------------------------------------------------------------
// Rectangle represents the Villanova Monastery (label #14)
//---------------------------------------------------------------------
    Rectangle monastery = new Rectangle (400, 650, 30, 30);
    monastery.setRotate(10);
    monastery.setFill(lightGreen);
    Text monasteryName = new Text(405, 670, "14");
    monasteryName.setStyle("-fx-font: 18 arial;");
    monasteryName.setRotate(10);


//---------------------------------------------------------------------
// Rectangle represents Austin Hall (label #15)
//---------------------------------------------------------------------
    Rectangle austin = new Rectangle (520, 680, 50, 20);
    austin.setRotate(10);
    austin.setFill(lightGreen);
    Text austinName = new Text(535, 695, "15");
    austinName.setStyle("-fx-font: 17 arial;");
    austinName.setRotate(10);


//---------------------------------------------------------------------
// Group section1 is created
//---------------------------------------------------------------------
    Group section1 = new Group (church, ceer, ceerName, tollentine, tollentineName, monastery, monasteryName,
austin, austinName, chemEngineering,
    chemName, johnBarry, johnBarryName, whiteHall, whiteName);


//---------------------------------------------------------------------
// Rectangle represents Mendel Science Center (label #3)
//---------------------------------------------------------------------
    Rectangle mendel = new Rectangle (400, 410, 140, 45);
    mendel.setFill(darkBlue);
    Text mendelName = new Text(465, 440, "3");
    mendelName.setStyle("-fx-font: 22 arial;");
    mendelName.setFill(Color.WHITE);
```

```
//-------------------------------------------------------------------
// Rectangle represents St. Augustine Center (label #4)
//-------------------------------------------------------------------
   Rectangle stAugustine = new Rectangle (600, 420, 70, 45);
   stAugustine.setFill(darkBlue);
   Text stAugName = new Text(630, 450, "4");
   stAugName.setStyle("-fx-font: 22 arial;");
   stAugName.setFill(Color.WHITE);


//-------------------------------------------------------------------
// Rectangle represents Falvey Memorial Library (label #5)
//-------------------------------------------------------------------
   Rectangle falvey = new Rectangle (470, 480, 70, 55);
   falvey.setFill(darkBlue);
   Text falveyName = new Text(500, 515, "5");
   falveyName.setStyle("-fx-font: 22 arial;");
   falveyName.setFill(Color.WHITE);


//-------------------------------------------------------------------
// Rectangle represents Alumni Hall (label #6)
//-------------------------------------------------------------------
   Rectangle alumniHall = new Rectangle (470, 570, 50, 20);
   alumniHall.setFill(darkBlue);
   Text alumniName = new Text(490, 585, "6");
   alumniName.setStyle("-fx-font: 17 arial;");
   alumniName.setFill(Color.WHITE);


//-------------------------------------------------------------------
// Rectangle represents Corr Hall (label #7)
//-------------------------------------------------------------------
   Rectangle corrHall = new Rectangle (580, 540, 50, 20);
   corrHall.setFill(darkBlue);
   Text corrName = new Text(600, 555, "7");
   corrName.setStyle("-fx-font: 17 arial;");
   corrName.setFill(Color.WHITE);


//-------------------------------------------------------------------
// Rectangle represents Kennedy Hall (label #8)
//-------------------------------------------------------------------
   Rectangle kennedyHall = new Rectangle (650, 520, 65, 25);
   kennedyHall.setFill(darkBlue);
   Text kennedyName = new Text(677, 538, "8");
   kennedyName.setStyle("-fx-font: 18 arial;");
   kennedyName.setFill(Color.WHITE);


//-------------------------------------------------------------------
// Group section2 is created, and each element is rotated 10 degrees.
//-------------------------------------------------------------------
   Group section2 = new Group (mendel, mendelName, stAugustine, stAugName, falvey, falveyName,
   alumniHall, alumniName, corrHall, corrName, kennedyHall, kennedyName);
   section2.setRotate(10);


//-------------------------------------------------------------------
// Rectangle represents Dougherty Hall (label #19)
//-------------------------------------------------------------------
```

```
    Rectangle dougherty = new Rectangle (600, 680, 50, 35);
    dougherty.setRotate(10);
    dougherty.setFill(Color.ORANGE);
    Text doughertyName = new Text(615, 705, "19");
    doughertyName.setStyle("-fx-font: 18 arial;");
    doughertyName.setRotate(10);


//-------------------------------------------------------------------
// Rectangle represents Bartley Hall (label #21)
//-------------------------------------------------------------------
    Rectangle bartley = new Rectangle (850, 580, 70, 160);
    bartley.setRotate(40);
    bartley.setFill(Color.ORANGE);
    Text bartleyName = new Text(880, 660, "21");
    bartleyName.setStyle("-fx-font: 22 arial;");
    bartleyName.setRotate(40);


//-------------------------------------------------------------------
// Rectangle represents Vasey Hall (label #20)
//-------------------------------------------------------------------
    Rectangle vasey = new Rectangle (670, 680, 50, 20);
    vasey.setRotate(10);
    vasey.setFill(Color.ORANGE);
    Text vaseyName = new Text(685, 695, "20");
    vaseyName.setStyle("-fx-font: 17 arial;");
    vaseyName.setRotate(10);


//-------------------------------------------------------------------
// Rectangle represents Connelly Center (label #18)
//-------------------------------------------------------------------
    Rectangle connelly = new Rectangle (680, 590, 80, 30);
    connelly.setRotate(10);
    connelly.setFill(Color.ORANGE);
    Text connellyName = new Text(705, 612, "18");
    connellyName.setStyle("-fx-font: 22 arial;");
    connellyName.setRotate(10);


//-------------------------------------------------------------------
// Rectangles represents Driscoll Hall (label #16)
//-------------------------------------------------------------------
    Rectangle driscoll = new Rectangle (770, 450, 80, 30);
    driscoll.setRotate(10);
    driscoll.setFill(Color.ORANGE);
    Text driscollName = new Text(820, 480, "16");
    driscollName.setStyle("-fx-font: 22 arial;");
    driscollName.setRotate(10);

    Rectangle driscoll2 = new Rectangle (815, 480, 30, 40);
    driscoll2.setRotate(10);
    driscoll2.setFill(Color.ORANGE);


//-------------------------------------------------------------------
// Rectangle represents Health Services (label #17)
//-------------------------------------------------------------------
    Rectangle healthServices = new Rectangle (950, 520, 50, 20);
    healthServices.setRotate(40);
```

```
      healthServices.setFill(Color.ORANGE);
      Text healthName = new Text(964, 536, "17");
      healthName.setStyle("-fx-font: 17 arial;");
      healthName.setRotate(40);


//----------------------------------------------------------------
// Group section3 is created.
//----------------------------------------------------------------
      Group section3 = new Group (bartley, bartleyName, dougherty, doughertyName, vasey, vaseyName,
      connelly, connellyName, driscoll, driscoll2, driscollName, healthServices, healthName);


//----------------------------------------------------------------
// Ellipse representing Villanova Stadium (label #23)
//----------------------------------------------------------------
      Ellipse stadium = new Ellipse (1080, 750, 120, 50);
      stadium.setRotate(10);
      stadium.setFill(Color.MAROON);
      Text stadiumName = new Text(1070, 760, "23");
      stadiumName.setStyle("-fx-font: 22 arial;");
      stadiumName.setFill(Color.WHITE);
      stadiumName.setRotate(10);


//----------------------------------------------------------------
// Ellipse representing Finneran Pavillion (label #22)
//----------------------------------------------------------------
      Ellipse finneran = new Ellipse (1140, 570, 30, 80);
      finneran.setRotate(40);
      finneran.setFill(Color.MAROON);
      Text finnName = new Text(1135, 570, "22");
      finnName.setStyle("-fx-font: 22 arial;");
      finnName.setFill(Color.WHITE);
      finnName.setRotate(40);


//----------------------------------------------------------------
// Group section4 is created.
//----------------------------------------------------------------
      Group section4 = new Group (stadium, stadiumName, finneran, finnName);


//----------------------------------------------------------------
// Rectangle representing Garey Hall (label #1)
//----------------------------------------------------------------
      Rectangle garey = new Rectangle (480, 180, 70, 55);
      garey.setRotate(30);
      garey.setFill(Color.PURPLE);
      Text gareyName = new Text(510, 213, "1");
      gareyName.setStyle("-fx-font: 22 arial;");
      gareyName.setRotate(30);


//----------------------------------------------------------------
// Rectangle representing Villanova Law School (label #2)
//----------------------------------------------------------------
      Rectangle lawSchool = new Rectangle (590, 240, 80, 30);
      lawSchool.setRotate(30);
      lawSchool.setFill(Color.PURPLE);
      Text lawName = new Text(625, 262, "2");
      lawName.setStyle("-fx-font: 22 arial;");
```

```java
   lawName.setRotate(30);

//---------------------------------------------------------------------
// Rectangle representing West Campus
//---------------------------------------------------------------------
   Rectangle westCampus = new Rectangle (360, 80, 70, 170);
   westCampus.setRotate(35);
   westCampus.setFill(Color.PURPLE);
   Text westName = new Text(330, 180, "West Campus");
   westName.setStyle("-fx-font: 22 arial;");
   westName.setRotate(-55);

//---------------------------------------------------------------------
// Group section5 is created.
//---------------------------------------------------------------------
   Group section5 = new Group (garey, gareyName, lawSchool, lawName, westCampus, westName);

//---------------------------------------------------------------------
// Rectangle representing I-1 parking lot
//---------------------------------------------------------------------
   Rectangle i1Lot = new Rectangle (870, 840, 50, 50);
   i1Lot.setRotate(5);
   i1Lot.setFill(Color.GRAY);
   Text i1Name = new Text(880, 870, "I-1");
   i1Name.setStyle("-fx-font: 20 arial;");
   i1Name.setRotate(5);

//---------------------------------------------------------------------
// Rectangle representing S-2 parking lot
//---------------------------------------------------------------------
   Rectangle s2Lot = new Rectangle (320, 585, 50, 50);
   s2Lot.setRotate(10);
   s2Lot.setFill(Color.GRAY);
   Text s2Name = new Text(330, 615, "S-2");
   s2Name.setStyle("-fx-font: 20 arial;");
   s2Name.setRotate(10);

//---------------------------------------------------------------------
// Rectangle representing S-3 parking lot
//---------------------------------------------------------------------
   Rectangle s3Lot = new Rectangle (380, 320, 50, 50);
   s3Lot.setRotate(10);
   s3Lot.setFill(Color.GRAY);
   Text s3Name = new Text(390, 350, "S-3");
   s3Name.setStyle("-fx-font: 20 arial;");
   s3Name.setRotate(10);

//---------------------------------------------------------------------
// Rectangle representing S-4 parking lot
//---------------------------------------------------------------------
   Rectangle s4Lot = new Rectangle (440, 230, 50, 50);
   s4Lot.setRotate(30);
   s4Lot.setFill(Color.GRAY);
   Text s4Name = new Text(450, 260, "S-4");
   s4Name.setStyle("-fx-font: 20 arial;");
   s4Name.setRotate(10);
```

```
//--------------------------------------------------------------------
// Rectangle representing S-5 parking lot
//--------------------------------------------------------------------
    Rectangle s5Lot = new Rectangle (570, 270, 50, 50);
    s5Lot.setRotate(30);
    s5Lot.setFill(Color.GRAY);
    Text s5Name = new Text(580, 300, "S-5");
    s5Name.setStyle("-fx-font: 20 arial;");
    s5Name.setRotate(10);


//--------------------------------------------------------------------
// Rectangle representing M-1 parking lot
//--------------------------------------------------------------------
    Rectangle m1Lot = new Rectangle (990, 440, 50, 50);
    m1Lot.setRotate(40);
    m1Lot.setFill(Color.GRAY);
    Text m1Name = new Text(1000, 470, "M-1");
    m1Name.setStyle("-fx-font: 20 arial;");
    m1Name.setRotate(40);


//--------------------------------------------------------------------
// Rectangle representing M-2 parking lot
//--------------------------------------------------------------------
    Rectangle m2Lot = new Rectangle (700, 430, 50, 50);
    m2Lot.setRotate(10);
    m2Lot.setFill(Color.GRAY);
    Text m2Name = new Text(710, 460, "M-2");
    m2Name.setStyle("-fx-font: 20 arial;");
    m2Name.setRotate(10);


//--------------------------------------------------------------------
// Rectangle representing M-3 parking lot
//--------------------------------------------------------------------
    Rectangle m3Lot = new Rectangle (700, 485, 30, 30);
    m3Lot.setRotate(10);
    m3Lot.setFill(Color.GRAY);
    Text m3Name = new Text(705, 500, "M-3");
    m3Name.setStyle("-fx-font: 14 arial;");
    m3Name.setRotate(10);


//--------------------------------------------------------------------
// Group section6 is created, containing all elements related to the parking lots.
//--------------------------------------------------------------------

    Group section6 = new Group (i1Lot, i1Name, s2Lot, s2Name, s3Lot, s3Name, s4Lot, s4Name, s5Lot, s5Name, m1Lot, m1Name,
    m2Lot, m2Name, m3Lot, m3Name);


//--------------------------------------------------------------------
// Image printed via ImageView of the U.S. Route 30 shield
//--------------------------------------------------------------------
    Image route30Img = new Image(new FileInputStream("US_30.png")); //U.S. 30 shield image filename
    ImageView route30 = new ImageView(route30Img);
    route30.setX(500);
    route30.setY(730);
```

```
//------------------------------------------------------------------
// Image printed via ImageView of the I-476 shield
//------------------------------------------------------------------
    Image i476Img = new Image(new FileInputStream("i476.png")); //I-476 shield image filename
    ImageView i476 = new ImageView(i476Img);
    i476.setX(30);
    i476.setY(50);


//------------------------------------------------------------------
// Image printed via ImageView of the SEPTA logo
//------------------------------------------------------------------
    Image septaImg = new Image (new FileInputStream("septa.png")); //SEPTA image filename
    ImageView septa = new ImageView(septaImg);
    septa.setX(70);
    septa.setY(270);


//------------------------------------------------------------------
// roadSymbols group is created.
//------------------------------------------------------------------
    Group roadSymbols = new Group(route30, i476, septa);


//------------------------------------------------------------------
// Group students is created.  20 student figures are added to an ImageView array via a loop.
// The student figures are plotted at a random location confined to Villanova's main campus on the map.
//------------------------------------------------------------------
    Group students = new Group();
    Image student = new Image(new FileInputStream("student.png")); //student image filename
    ImageView[] imageViewArray = new ImageView[20];

    for (int i = 1; i<20; i++)
    {
       imageViewArray[i] = new ImageView(student);
       int randX = rand.nextInt(600)+380;
       int randY = rand.nextInt(300)+350;
       imageViewArray[i].setX(randX);
       imageViewArray[i].setY(randY);
       students.getChildren() .add(imageViewArray[i]);
     }


//------------------------------------------------------------------
// Rectangle containing legend for map is printed.
//------------------------------------------------------------------

    Rectangle legendRect = new Rectangle (800, 10, 470, 350);
    legendRect.setStroke(novaBlue);
    legendRect.setStrokeWidth(2);
    legendRect.setFill(Color.GREEN);
    Image novaLogo = new Image(new FileInputStream("nova.png")); //Villanova logo filename
    ImageView novaLegend = new ImageView(novaLogo);
    novaLegend.setX(810);
    novaLegend.setY(30);


//------------------------------------------------------------------
// Legend header is printed.  Identifiers for all campus locations are listed in numerical order.
//------------------------------------------------------------------
```

```
Text legendHeader = new Text(910, 60, "Villanova Campus Map");
legendHeader.setFill(novaBlue);
legendHeader.setStyle("-fx-font: 20 arial;" + "-fx-font-weight: bold;");

Text legend1 = new Text(810, 110, "1 - Garey Hall");
legend1.setFill(novaBlue);
legend1.setStyle("-fx-font: 16 arial;");

Text legend2 = new Text(810, 130, "2 - Law School Building");
legend2.setFill(novaBlue);
legend2.setStyle("-fx-font: 16 arial;");

Text legend3 = new Text(810, 150, "3 - Mendel Science Center");
legend3.setFill(novaBlue);
legend3.setStyle("-fx-font: 16 arial;");

Text legend4 = new Text(810, 170, "4 - St. Augustine Center");
legend4.setFill(novaBlue);
legend4.setStyle("-fx-font: 16 arial;");

Text legend5 = new Text(810, 190, "5 - Falvey Memorial Library ");
legend5.setFill(novaBlue);
legend5.setStyle("-fx-font: 16 arial;");

Text legend6 = new Text(810, 210, "6 - Alumni Hall");
legend6.setFill(novaBlue);
legend6.setStyle("-fx-font: 16 arial;");

Text legend7 = new Text(810, 230, "7 - Corr Hall");
legend7.setFill(novaBlue);
legend7.setStyle("-fx-font: 16 arial;");

Text legend8 = new Text(810, 250, "8 - Kennedy Hall");
legend8.setFill(novaBlue);
legend8.setStyle("-fx-font: 16 arial;");

Text legend9 = new Text(810, 270, "9 - John Barry Hall");
legend9.setFill(novaBlue);
legend9.setStyle("-fx-font: 16 arial;");

Text legend10 = new Text(810, 290, "10 - Chem Engineering Building");
legend10.setFill(novaBlue);
legend10.setStyle("-fx-font: 16 arial;");

Text legend11 = new Text(810, 310, "11 - White Hall");
legend11.setFill(novaBlue);
legend11.setStyle("-fx-font: 16 arial;");

Text legend12 = new Text(810, 330, "12 - CEER");
legend12.setFill(novaBlue);
legend12.setStyle("-fx-font: 16 arial;");

Text legend13 = new Text(810, 350, "13 - Tollentine Hall");
legend13.setFill(novaBlue);
legend13.setStyle("-fx-font: 16 arial;");
```

```java
    Text legend14 = new Text(1080, 110, "14 - Monastery");
    legend14.setFill(novaBlue);
    legend14.setStyle("-fx-font: 16 arial;");

    Text legend15 = new Text(1080, 130, "15 - Austin Hall");
    legend15.setFill(novaBlue);
    legend15.setStyle("-fx-font: 16 arial;");

    Text legend16 = new Text(1080, 150, "16 - Driscoll Hall");
    legend16.setFill(novaBlue);
    legend16.setStyle("-fx-font: 16 arial;");

    Text legend17 = new Text(1080, 170, "17 - Health Services");
    legend17.setFill(novaBlue);
    legend17.setStyle("-fx-font: 16 arial;");

    Text legend18 = new Text(1080, 190, "18 - Connelly Center");
    legend18.setFill(novaBlue);
    legend18.setStyle("-fx-font: 16 arial;");

    Text legend19 = new Text(1080, 210, "19 - Dougherty Hall");
    legend19.setFill(novaBlue);
    legend19.setStyle("-fx-font: 16 arial;");

    Text legend20 = new Text(1080, 230, "20 - Vasey Hall");
    legend20.setFill(novaBlue);
    legend20.setStyle("-fx-font: 16 arial;");

    Text legend21 = new Text(1080, 250, "21 - Bartley Hall");
    legend21.setFill(novaBlue);
    legend21.setStyle("-fx-font: 16 arial;");

    Text legend22 = new Text(1080, 270, "22 - Finneran Pavillion");
    legend22.setFill(novaBlue);
    legend22.setStyle("-fx-font: 16 arial;");

    Text legend23 = new Text(1080, 290, "23 - Stadium");
    legend23.setFill(novaBlue);
    legend23.setStyle("-fx-font: 16 arial;");

  //-------------------------------------------------------------------
  // Explanation for parking lot identifiers is displayed.
  //-------------------------------------------------------------------
    Text legend24 = new Text(1040, 320, "Parking lots:  I-1, M-2, M-3, S-2, S-3,\nS-4, S-5");
    legend24.setFill(novaBlue);
    legend24.setStyle("-fx-font: 12 arial;");


  //-------------------------------------------------------------------
  // Group created pertaining to the legend and all of its elements.
  //-------------------------------------------------------------------
    Group legend = new Group(legendRect, novaLegend, legendHeader, legend1, legend2, legend3, legend4, legend5, legend6,
    legend7, legend8, legend9, legend10, legend11, legend12, legend13, legend14, legend15, legend16, legend17, legend18,
    legend19, legend20, legend21, legend22, legend23, legend24);
```
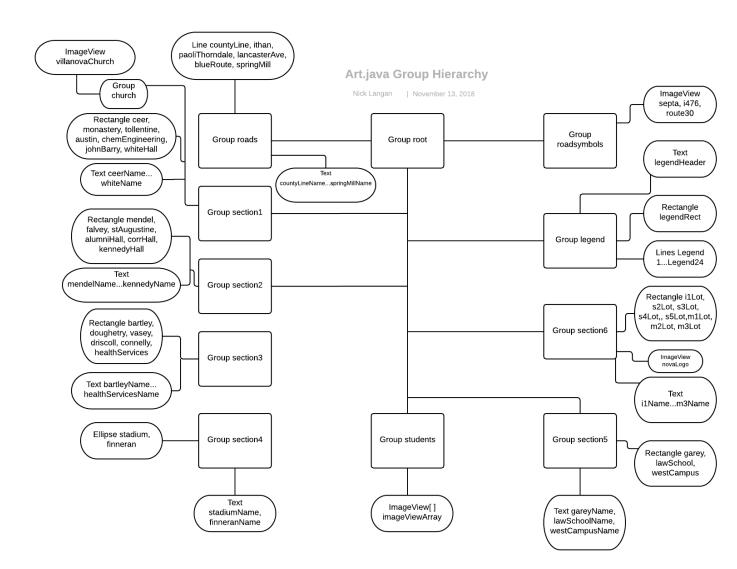
```
//------------------------------------------------------------------
// Root group is created containing all previously defined groups.
//------------------------------------------------------------------
    Group root = new Group(roads, roadSymbols, section1, section2, section3, section4, section5, section6, legend,
students);

//------------------------------------------------------------------
// Scene and stage are created with root group, size, title, and green background color.
//------------------------------------------------------------------
    Scene scene = new Scene(root, 1280, 900, Color.GREEN);

    primaryStage.setTitle("Villanova Campus Map");
    primaryStage.setScene(scene);
    primaryStage.show();
}

public static void main(String[] args)
{
    launch(args);
}
}
```

## SAMPLE RUN IMAGES (3)

**Group Hierarchy Chart**



**Art.java Group Hierarchy**

Nick Langan    |    November 13, 2018

**PROJECT SYNOPSIS**

   Project 8 spanned work over three days and took around five hours for me to complete. When pondering different ideas for a JavaFX project, I had some pictures in mind.  None of them seemed particularly captivating.  I have, however, always been interested in maps.  It is sort of a lost art now, with Google Maps taking a permanent hold of the landscape.  Specialized maps, though, are still necessary, and it dawned on me how the features of the JavaFX package would work perfectly in generating elements of a basic map.  And, with learning the buildings

and layout of the Villanova campus, what would be a better map to draw but one of the campus itself?

The map I ended up producing is rather basic and is clearly missing a few portions of the campus (dormitories and the South Campus in particular).  Still, I was happy with how the rendering came out.  I tapped into the imageView component to display road shields, transparent logos, and a rendering of the Villanova church.  This technique ended up being simple to learn and I was happy to grasp it.

The biggest challenge was determining what I could introduce as a randomly generating element.  I could have drawn a stick figure of a student, but, I know it would not have come out well.  Instead, I found a simple PNG of a student carrying a backpack, and I wanted to plot the student randomly 20 times across the space of the map that depicts Villanova's main campus.  Through this example (http://www.cs.armstrong.edu/liang/intro10e/html/ListViewDemoWithLineNumber.html), I was able to determine that it is possible to have an array comprised of elements of ImageView.  This would work out perfectly, because I could not add the same image via a loop to one ImageView.  Instead, I have a loop adding the same image (the student PNG) to an ImageView array of length 20.  I would have had no idea how to do this had we not covered arrays beginning last week!

I used a platform called LucidChart to produce the group hierarchy chart for my program.  I had access to this at my prior IT job but never used it.  Shhhh….they never cut my access off!  It can produce all kinds of neat diagrams and charts that are perfect visual aids for projects such as this.

I was skeptical with the type of image I was going to be able to come up (art is surely not my forte), but being able to invoke my love of maps was a delight.