**Hello\_3d\_World Documentation**

**Created by**

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**2110215 Programming Methodology**

**Semester 1 Year 2019**

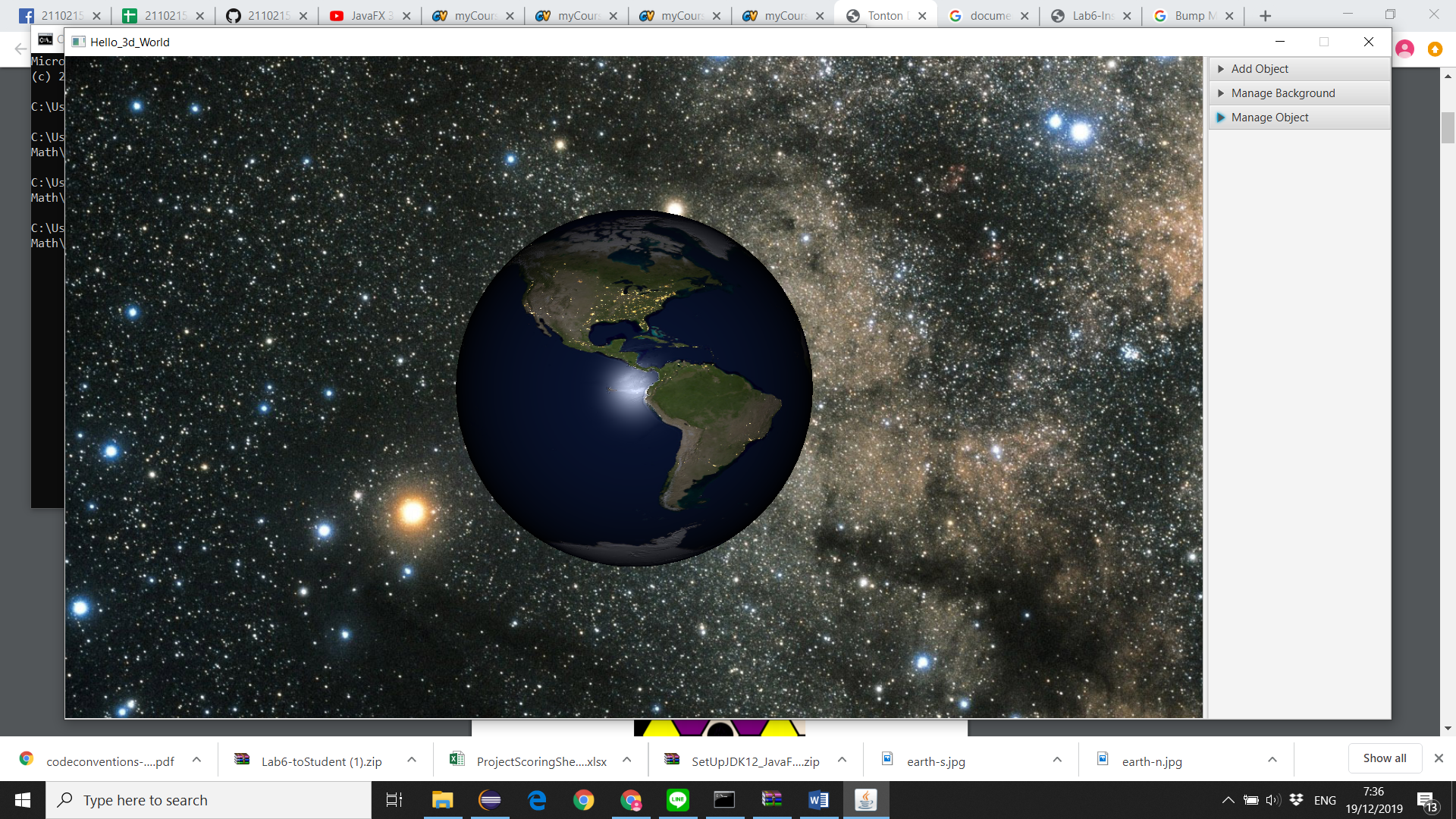
**Chulalongkorn University**

**Hello\_3d\_World**

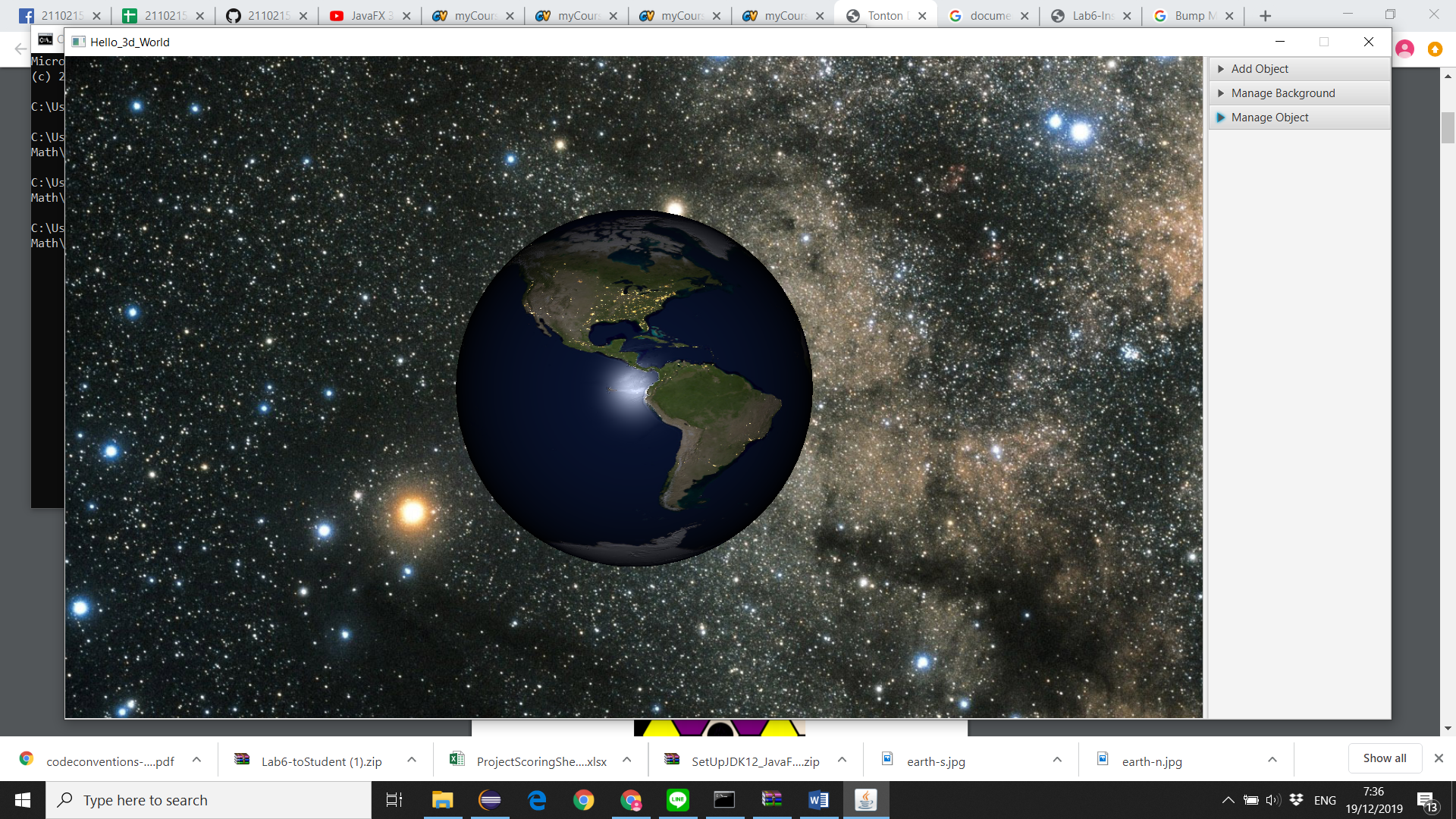
**Introduction**

Hello\_3d\_World application is inspired by difficult of putting 3D object from outside java to java code. The method is too complicate. This project is made for building your own 3D object in javafx in order to use in your code because every shape is original in javafx.

**Interface**



The screen split into two part. First part in the left is 3D view which show your 3D object in 3D perspective camera so you can move around to see your object freely.



The second part is editor which you can add object, manage background, manage individual object.

**Keyboard control**

Press NUMPAD 1 = set camera to bottom Press NUMPAD 2 = set camera to front

Press NUMPAD 4 = set camera to left Press NUMPAD 5 = set camera to top

Press NUMPAD 6 = set camera to right Press NUMPAD 8 = set camera to back

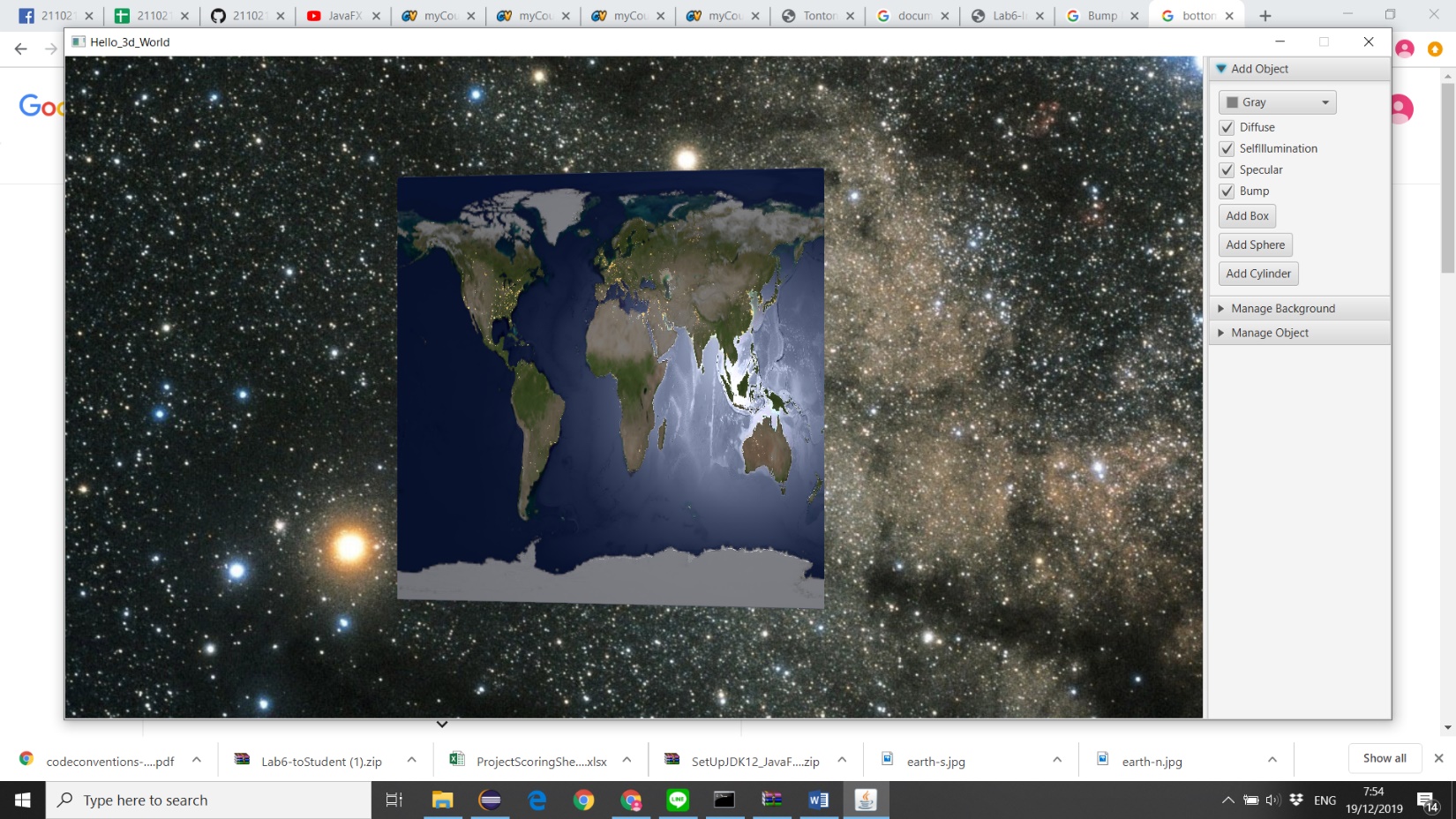
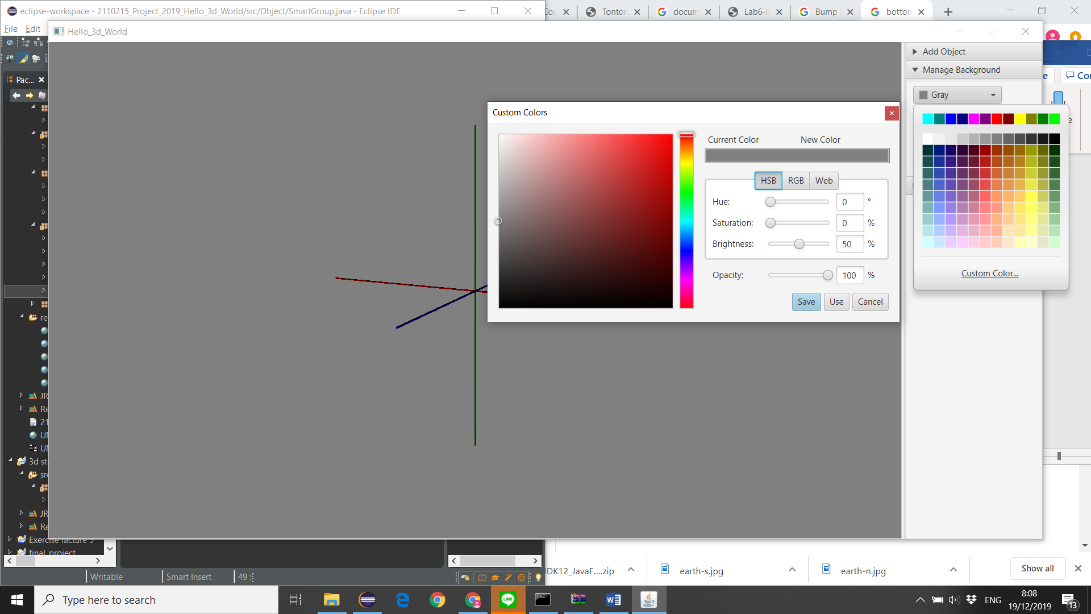
Press A = move camera to left Press D = move camera to right

Press S = move camera to bottom Press W = move camera to top

Press Q = zoom in Press E = zoom out

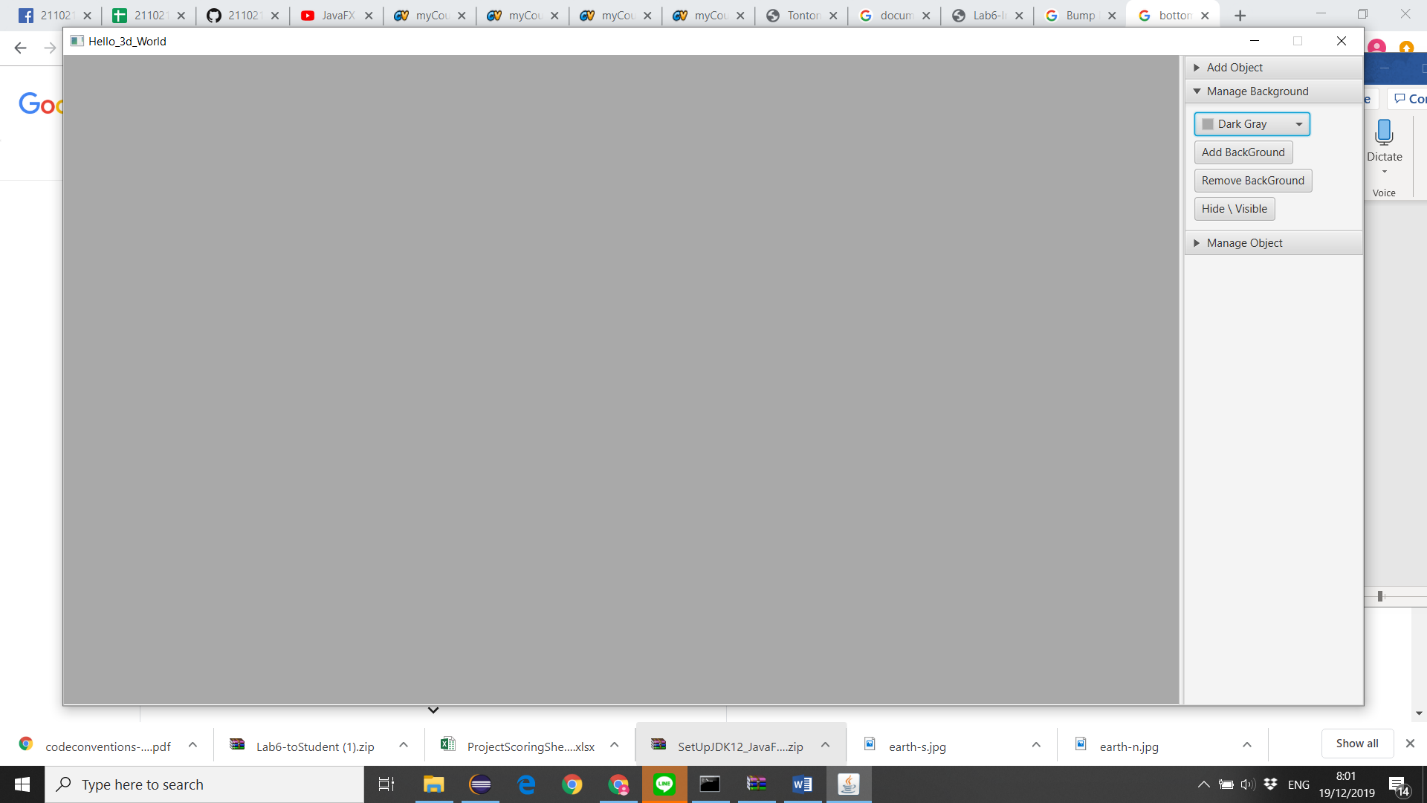
**Mouse control**

Double click Object = delete object

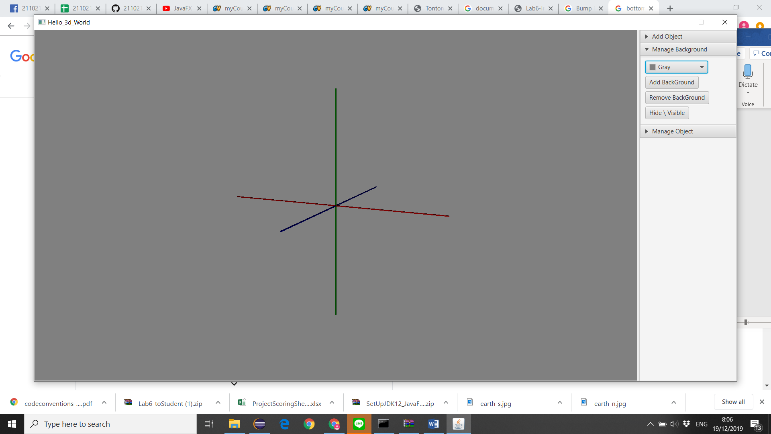
******Editor panel**

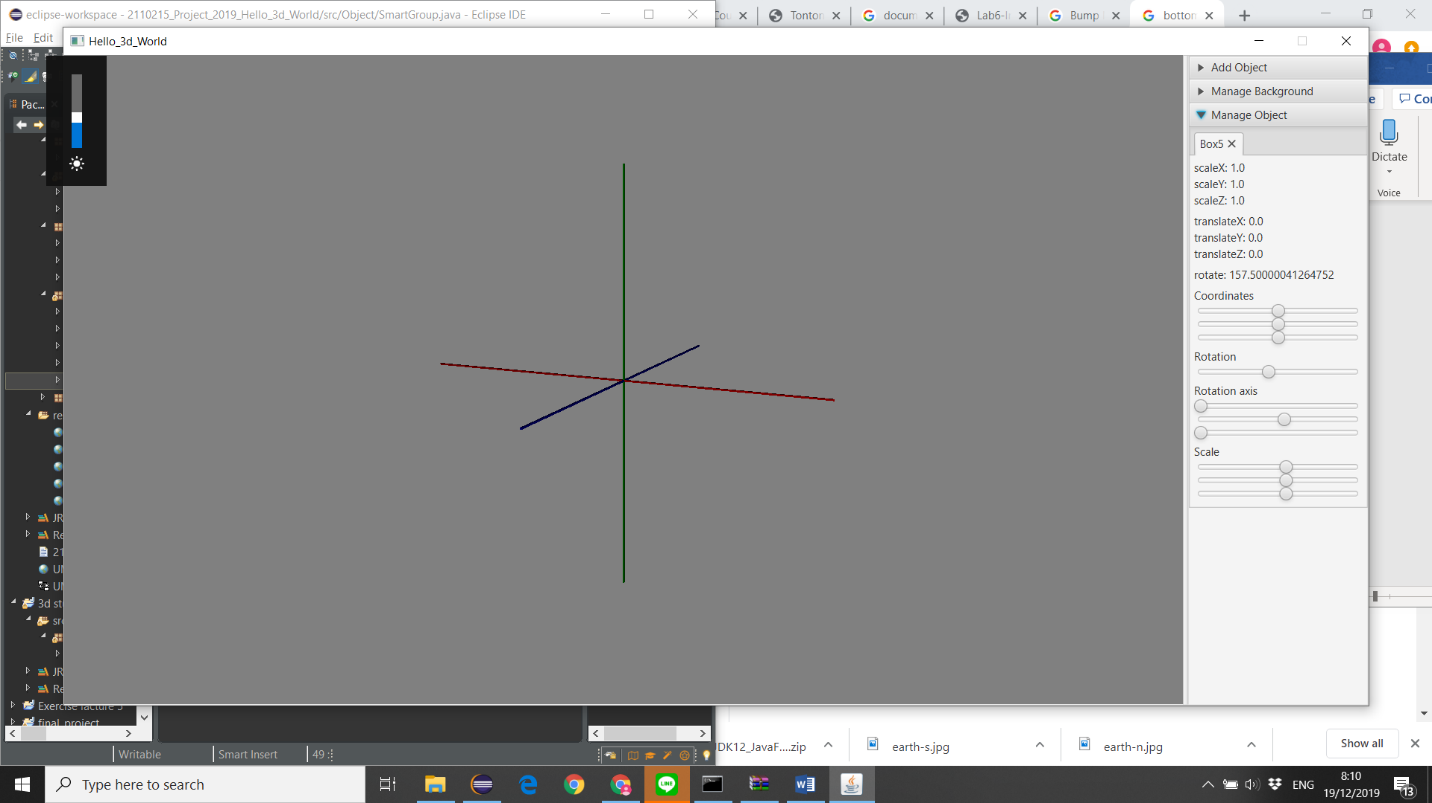
**Add Object**

in Add Object titlepane have color picker to choose the color of the object that you want to create. Checkboxs are choose which map you want to add to your object example Diffuse is to give texture to the object, Bump check box is to give bumpmap to object. Finally they are button to add object. We can add object box, sphere and cylinder. When you add object, it will add object to 3d view and add to manage object.

**Manage Background**

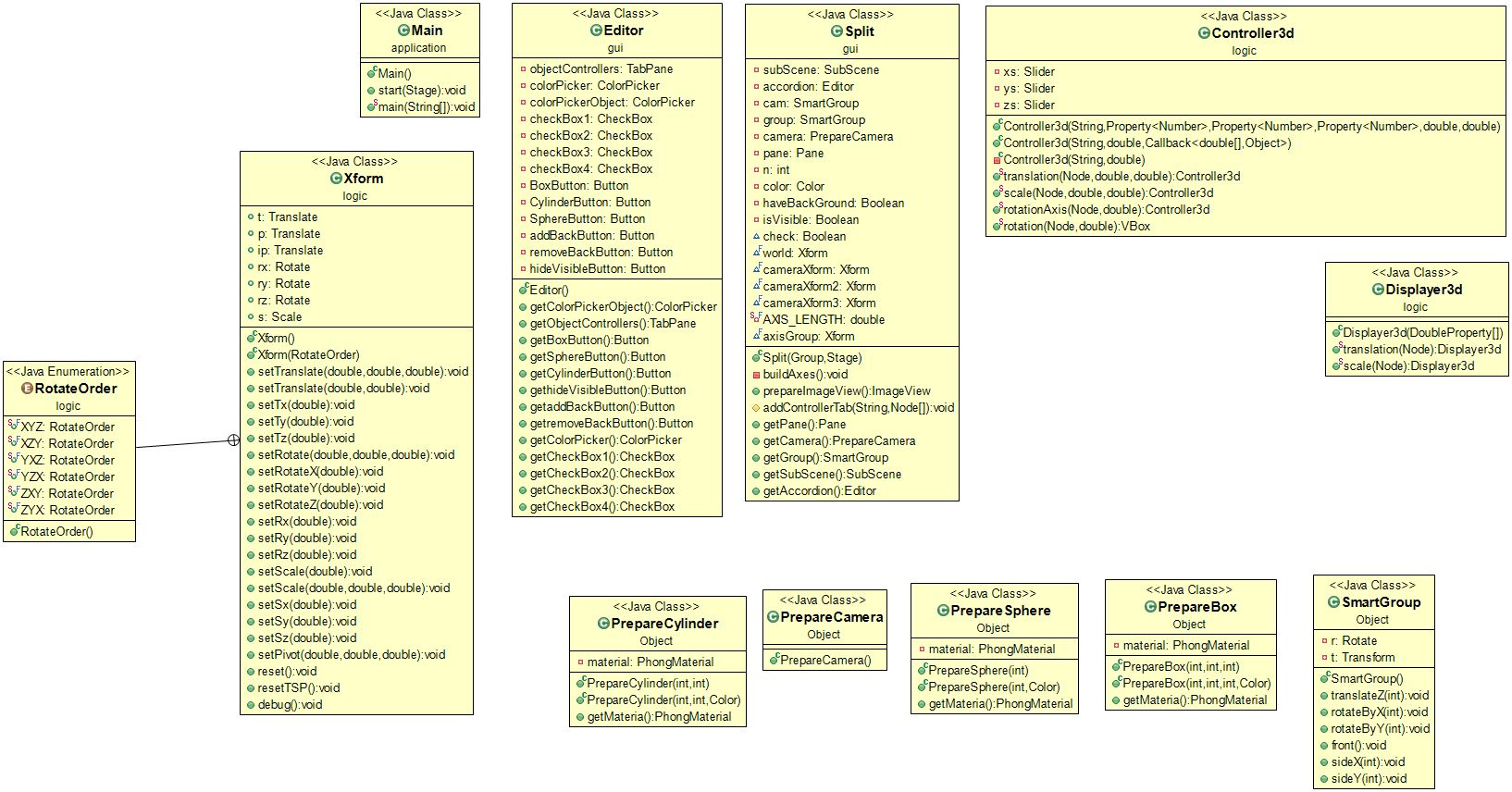
in manage background titlepane have color picker to choose the color of the background of 3D view. Next button is to add image background to 3D view and next button is to delete image background. Next button is to hide or show arc 3D

 which guide which axis you are.

**Manage object**

In manage object titlepane have tab that show property of individual object. When you create new object it will new tab and the name of the tab will be “what object” + “number of time you create object”. In the first row we have property thatshow how much you change size or move far origin. Next in the slide bar below use to change location and change Rotation so you hav to choose axis to rotate in Rotation axis. Next is scale is to chage to scale of object.

**Class diagram**

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**1.Package Object**

**1.1PrepareBox**

**1.1.1Fields**

|  |  |
| --- | --- |
| - PhongMaterial material | Store texture of shape |

**1.1.2Constructor**

|  |  |
| --- | --- |
| + PrepareBox(int Width, int Height, int Depth) | Initialize box and Initialize material |
| + PrepareBox(int Width, int Height, int Depth, Color color) | Initialize box and Initialize material and set color to box |

**1.1.3Methods**

|  |  |
| --- | --- |
| + PhongMaterial getMaterial() | Getter return material |

**1.2PrepareCamera**

**1.2.1Constructor**

|  |  |
| --- | --- |
| + PrepareCamera() | Set near clip and far clip and set start location |

**1.3PrepareCylinder**

**1.3.1Fields**

|  |  |
| --- | --- |
| - PhongMaterial material | Store texture of shape |

**1.3.2Constructor**

|  |  |
| --- | --- |
| + PrepareCylinder(int Diameter, int Height) | Initialize Cylinder and Initialize material |
| + PrepareCylinder(int Diameter, int Height, Color color) | Initialize Cylinder and Initialize material and set color to Cylinder |

**1.3.3Methods**

|  |  |
| --- | --- |
| + PhongMaterial getMaterial() | Getter return material |

**1.4PrepareSphere**

**1.4.1Fields**

|  |  |
| --- | --- |
| - PhongMaterial material | Store texture of shape |

**1.4.2Constructor**

|  |  |
| --- | --- |
| + PrepareSphere(int Diameter) | Initialize Sphere and Initialize material |
| + PrepareSphere(int Diameter, Color color) | Initialize Sphere and Initialize material and set color to Sphere |

**1.4.3Methods**

|  |  |
| --- | --- |
| + PhongMaterial getMaterial() | Getter return material |

**1.5SmartGroup**

**1.5.1Fields**

|  |  |
| --- | --- |
| - Rotate r | Value degree of rotate |
| - Transform t | History of transform |

**1.5.2Methodst**

|  |  |
| --- | --- |
| + void translateZ(int ang) | Translate in z axis in ang degree |
| + void rotateByX(int ang) | Rotate in x axis in ang degree |
| + void rotateByY(int ang) | Rotate in y axis in ang degree |
| + void front() | Set camera to front |
| + void sideX(int ang) | Set camera in x axis in ang degree |
| + void sideY(int ang) | Set camera in y axis in ang degree |

**2.Package logic**

**2.1PrepareSphere**

**2.1.1Fields**

|  |  |
| --- | --- |
| - Slider xs | Slider for x axis |
| - Slider ys | Slider for y axis |
| - Slider zs | Slider for z axis |

**2.1.2Constructor**

|  |  |
| --- | --- |
| + Controller3d(String title, Property<Number> x, Property<Number> y, Property<Number> z, double max, double min) | Initialize sliders and add max value and min value to sliders |
| + Controller3d(String title, double max, Callback<double[], Object> apply) | Initialize sliders and add max value |
| + Controller3d(String title, double max) | Initialize sliders and add max value |

**2.1.3Methods**

|  |  |
| --- | --- |
| + Controller3d translation(Node n, double limit, double min) | Initialize sliders that change location object |
| + Controller3d scale(Node n, double limit, double min) | Initialize sliders that change location scale |
| + Controller3d rotationAxis(Node n, double limit) | Initialize sliders that set rotation axis |
| + VBox rotation(Node n, double limit) | Initialize sliders that rotate object |

**2.2Displayer3d**

**2.2.1Constructor**

|  |  |
| --- | --- |
| + Displayer3d(DoubleProperty... ps) | Store property |

**2.2.2Methods**

|  |  |
| --- | --- |
| + Displayer3d translation(Node n) | Show translate property |
| + Displayer3d scale(Node n) | Show scale property |

**2.3Xform**

Is class to create axis guider they have many method for future but not use in current version of application.

**3.Package gui**

**1.1Editor**

**Is class that create accordion for second split scene**

**2.3split**

**Is class that create splitpane and initialize editor and subscene to make 3d view**

**4.Package application**

**4.1Main**

**4.1.3Methods**

|  |  |
| --- | --- |
| + void start(Stage primaryStage) | Initializes splitepane from class split  Initializes group  Add group and splitpane to to the scene  Size 1400, 700 and set depth buffer true  Add action colorpicker to change color background  Stage set scene and show |
| + void main(String[] args) | Start Program |