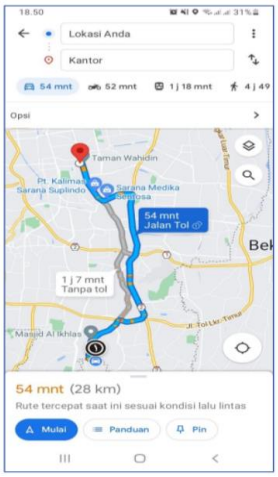
Nama : La Ode Muhammad Gazali
NIM : 222212696
Kelas : 2KS2

TUGAS PRA-PERTEMUAN 7 PEMROGRAMAN BERORIENTASI OBJEK

(Design Pattern)

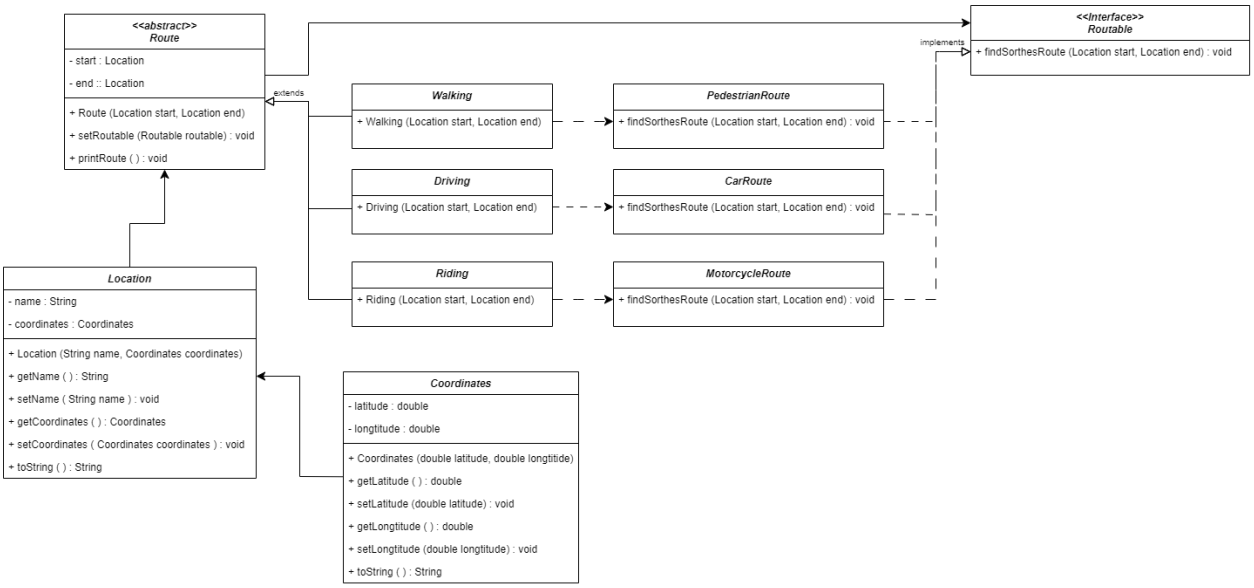
Case Study



- Sebuah aplikasi memiliki fitur untuk menentukan rute dua titik lokasi. Fitur ini memungkinkan pengguna untuk memilih rute terbaik sesuai moda transportasi yang dipilih.
- Buatlah desain kelas dari fitur aplikasi tersebut menggunakan class diagram dengan menerapkan strategy pattern. Selanjutnya implementasikan dengan bahasa pemrograman Java.

Penyelesaian :

A. Class Diagram



B. Implementasi Program

- **Coordinates.java**

```java
public class Coordinates {
    private double latitude;
    private double longitude;

    public Coordinates(double latitude, double longitude) {
      this.latitude = latitude;
      this.longitude = longitude;
    }

    public double getLatitude() {
      return latitude;
    }

    public void setLatitude(double latitude) {
      this.latitude = latitude;
    }

    public double getLongitude() {
      return longitude;
    }

    public void setLongitude(double longitude) {
      this.longitude = longitude;
    }

    @Override
    public String toString() {
      return (
        "Coordinates[latitude=" + latitude + ", longitude=" + longitude + "]"
      );
    }
}
```

- **Location.java**

```java
public class Location {
    private String name;
    private Coordinates coordinates;

    public Location(String name, Coordinates coordinates) {
```

```
      this.name = name;
      this.coordinates = coordinates;
    }

    public String getName() {
      return name;
    }

    public void setName(String name) {
      this.name = name;
    }

    public Coordinates getCoordinates() {
      return coordinates;
    }

    public void setCoordinates(Coordinates coordinates) {
      this.coordinates = coordinates;
    }

    @Override
    public String toString() {
      return "Location[name=" + name + ", coordinates=" + coordinates + "]";
    }
}
```

- **Routable.java (Interface)**

```
public interface Routable{
    public void findShortestRoute(Location start, Location end);
}

/**
* CarRoute
 */
class CarRoute implements Routable{
    @Override
    public void findShortestRoute(Location start, Location end){
        System.out.println("Ini rute untuk mobil");
    }
}

/**
```

```
* MotorcycleRoute
 */
class MotorcycleRoute implements Routable{
    @Override
    public void findShortestRoute(Location start, Location end){
        System.out.println("Ini rute untuk motor");
    }
}

/**
* PedestrianRoute
 */
class PedestrianRoute implements Routable{
    @Override
    public void findShortestRoute(Location start, Location end){
        System.out.println("Ini rute untuk pejalan kaki/pedestrian");
    }
}
```

- **Route.java (Abstract Class)**

```
public abstract class Route {
    private Location start;
    private Location end;
    private Routable routable;

    protected Route(Location start, Location end){
        this.start = start;
        this.end = end;
    }

    public void setRoutable(Routable routable){
        this.routable = routable;
    }

    public void printRoute() {
        routable.findShortestRoute(start, end);
    }
}

/**
* Driving
 */
class Driving extends Route {
```

```
    public Driving (Location start, Location end){
        super(start, end);
        super.setRoutable(new CarRoute());
    }
}

/**
  * Riding
  */
class Riding extends Route {
    public Riding(Location start, Location end){
        super(start, end);
        super.setRoutable(new MotorcycleRoute());
    }
}

/**
 * Walking
 */
class Walking extends Route{
    public Walking(Location start, Location end){
        super(start, end);
        super.setRoutable(new PedestrianRoute());
    }
}
```

- **Main_Test.java**

```
public class Main_Test {
    public static void main (String args[]){
        Location STIS = new Location(
            "POLSTAT STIS",
            new Coordinates(-6.231d, 106.867)
        );
        Location STAN = new Location(
            "PKN STAN",
            new Coordinates(-6.267d, 106.732)
        );

        Route drivingRoute = new Driving(STIS, STAN);
        drivingRoute.printRoute();
```

```
        Route ridingRoute = new Riding(STIS, STAN);
        ridingRoute.printRoute();

        Route walkingRoute = new Walking(STIS, STAN);
        walkingRoute.printRoute();
    }
}
```

- **Hasil Compile**

```
D:\POLSTAT STIS\Semester 4\Pemrograman Objek\Pertemuan 7\Pra-Pertemuan 7>java Main_Test
Ini rute untuk mobil
Ini rute untuk motor
Ini rute untuk pejalan kaki/pedestrian
```