

Application Design Document (Part I & II)

specifications for the TUMap application

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1. Document Overview

TUmap is a highly customized campus specific Android application that aims to ease navigation around campus for new students and guests. It will be Android based and levy Google Maps API for routing and an open source mapping toolkit for our custom map. The interface will include a simple drop down menu of buildings on campus. Once a building is selected, a user's location will be automatically polled and a route will be traced to their destination. As the user moves, the phone will update the GPS location and the route if necessary. The Application Design Document (Part I) describes the application architecture and how the requirements are mapped into the design. This document will be a combination of diagrams and text that describes what the diagrams are showing.

1.1 Purpose

The purpose of this document is to provide a detailed description of the TUMap application, developed for Temple University, in a holistic manner. It will serve not only as a source for those who wish to continue with the implementation of the application, but for those also focused on understanding the various object interactions, and how they are modeled, within the application.

1.2 Scope

The document includes much of the necessary architectural components of the application and the design of the internal database used to store campus locations. The description that follows will elaborate on the application's architecture with an array of diagrams (i.e. UML diagrams, state diagrams, sequence diagrams) for clarity.

1.3 Definitions, Acronyms, Abbreviations

Activity – An activity is a single, focused thing that the user can do. Almost all activities interact with the user, so the Activity class takes care of creating a window for you in which you can place your UI with **setContentView(View)**.

Context – Interface to global information about an application environment.

View – This class represents the basic building block for user interface components.

Intent – Intent is an abstract description of an operation to be performed. It can be used with **startActivity** to launch an **Activity**.

Content provider – A *content provider* manages a shared set of application data. You can store the data in the file system, an SQLite database, on the web, or any

other persistent storage location your application can access. Through the content provider, other applications can query or even modify the data (if the content provider allows it).

AndroidManifest.xml – The manifest presents essential information about the application to the Android system, information the system must have before it can run any of the application's code.

SQLiteDatabase – Wrapper class giving access to db and execution of SQL cmd's.

SQLiteOpenHelper – A utility used for db creation and version management (works with content providers).

Cursor – A structured object that encapsulates the query results.

SimpleCursorAdapter – used to go from data model to a view.

2. Design Overview

2.1 Introduction

This section acts as a brief overview of the applications design. This will place the applications overall structure into prespective by illustrating the external, and internal, behaviors.

2.2 Application Architecture

2.2.1 System Design

Figure 1 depicts a set of objects and there relationships when the application is running. **Figure 2** illustrates the flow from activity to activity. **Figure 3** provides a state digram for the application

CampusMapActivity – starts the application; opens the database.

CampusLocationsDbAdapter – stores the location records; provides search results from query.

CampusDbHelper – helper class that creates, opens, and manages (i.e upgrade) the location database.

CampusBuildingOverlay – visually designates a geolocation on the map view.

CampusPathHelper – helper class that manages the creation of a path.

CampusPath – path overlay that displays on top of a map view; denotes a route from two geopoints.

CachedRoute – stores a generated route for fast rendering.

CachedRouteAggregator – keeps a collection (i.e. **ArrayList**) of stored routes.

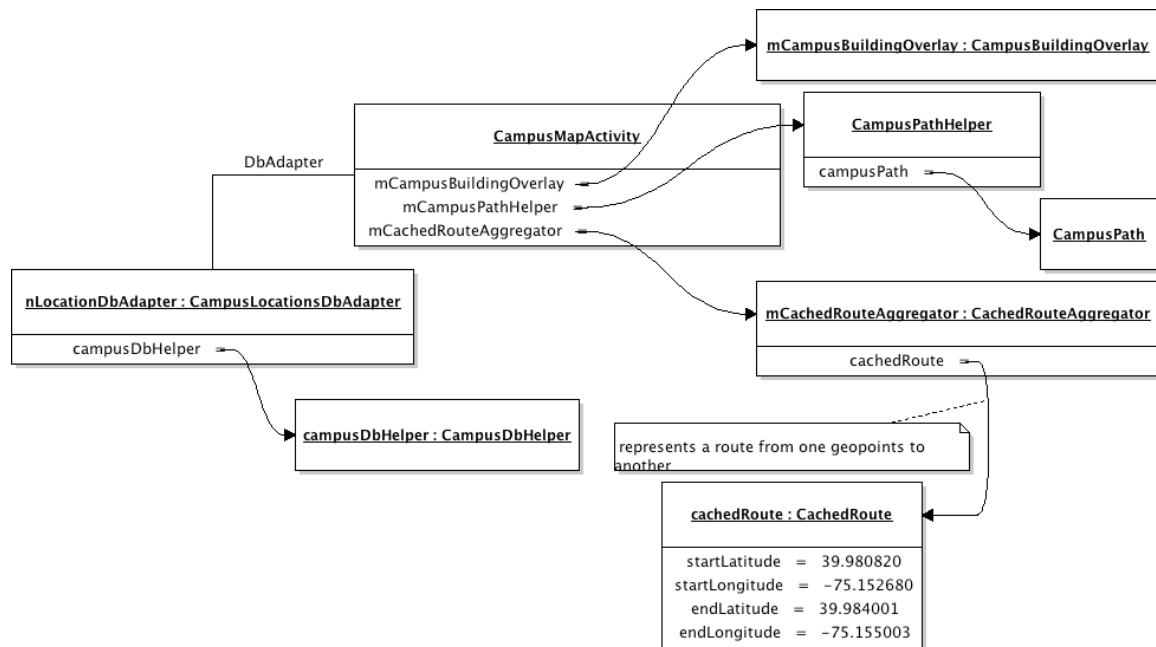


Figure 1: Object Diagram for TUMap

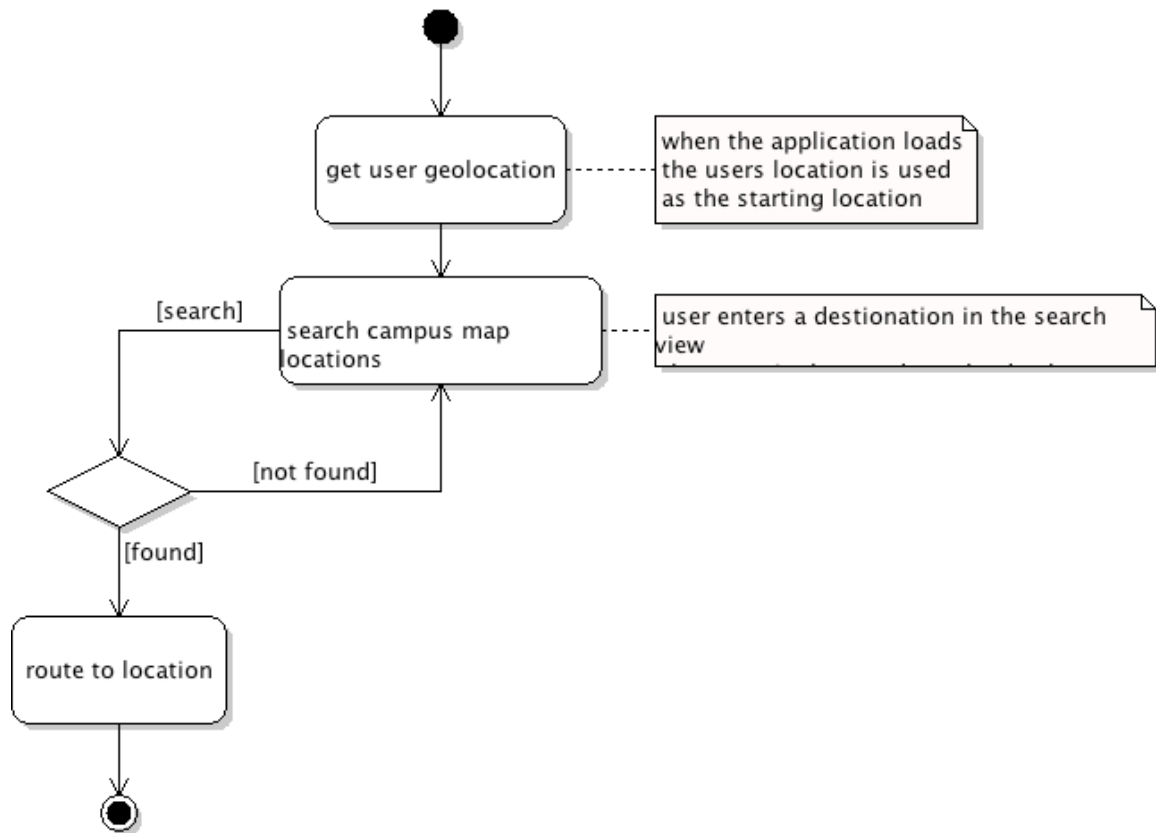


Figure 2: Activity Diagram for TUMap

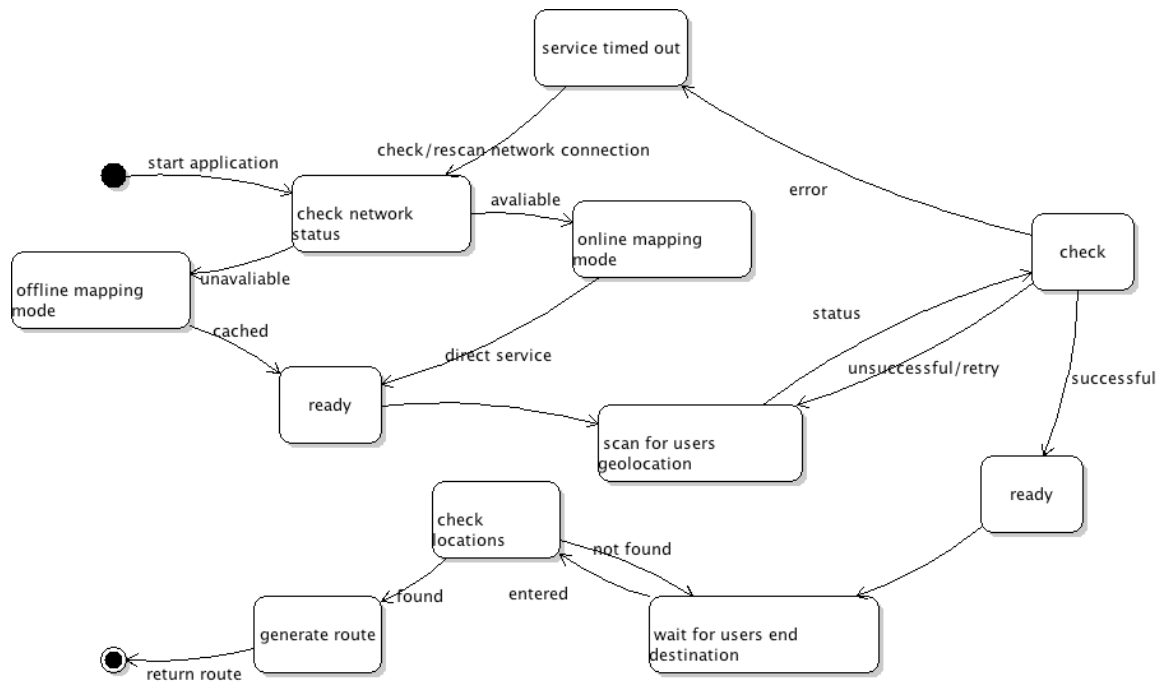


Figure 3: State Diagram for TUMap

2.2.2 System Operations

Figure 4 captures the interaction between parts of the application.

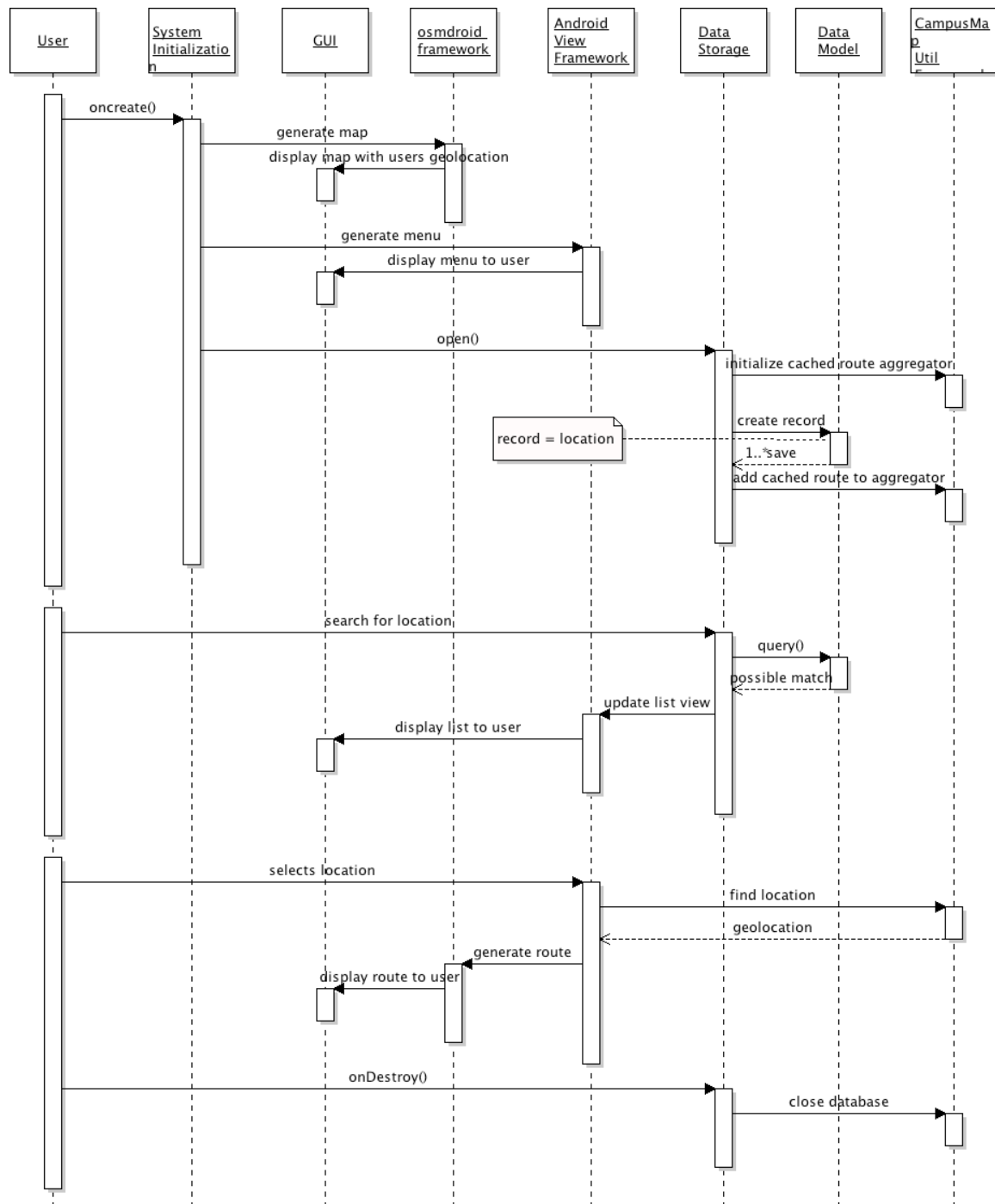


Figure 4: Sequence Diagram for TUMap

2.3 Application Interfaces

Figure 5 depicts the UML model for the main application interface that the user can interact with. The **CampusMapActivity** class takes care of creating the window in which the user can interact with. The **CampusMapActivityDemo** activity will create a **Screen** object and will hold a reference to that object; the **Screen** object is more of a conceptual representation of what is occurring during the applications initial rendering of the UI. **Figure 6** depicts the UML diagram for the TUMap application.

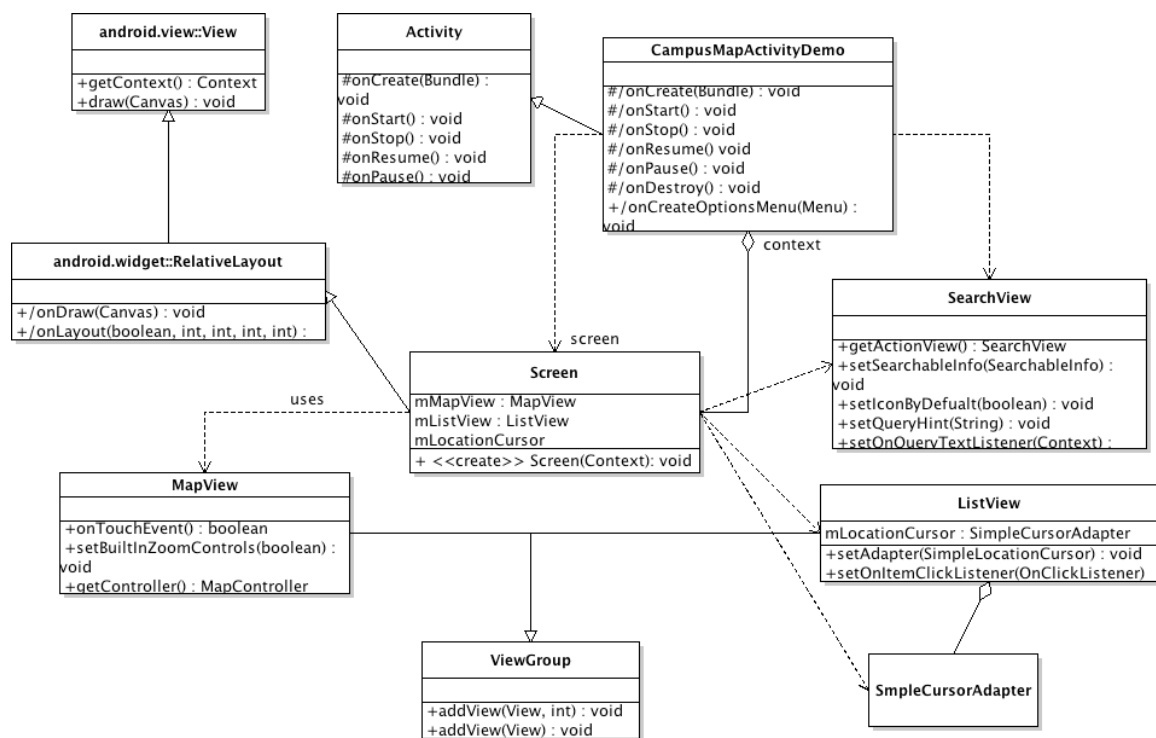


Figure 5: Main Screen Interface

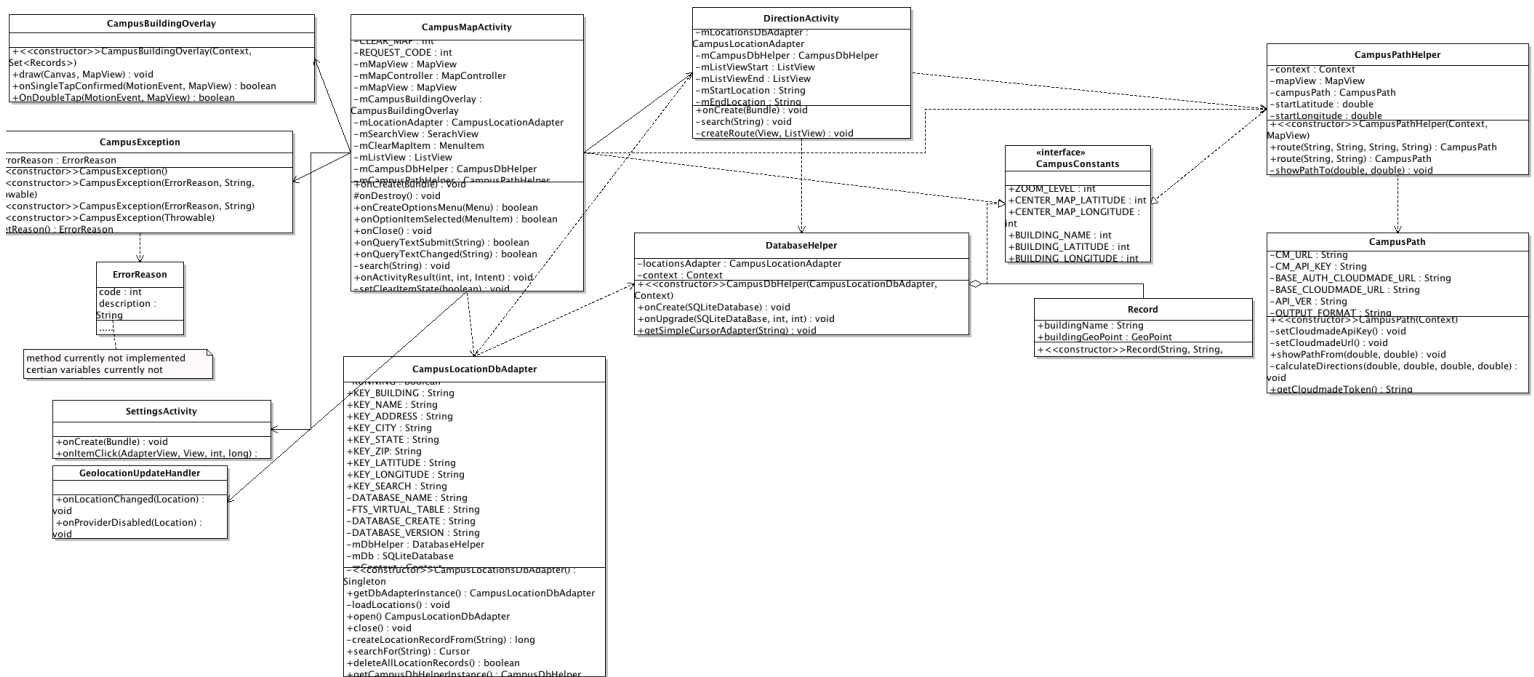


Figure 6: TUMap implementation class level UML

3. Data Model and Storage

The Data Model (**Figure 7**) and Storage (**Figure 8**) classes control behaviors associated with user search results and information needed for routing from one destination to another. The Data Model holds the desired locations (i.e. address, building name, etc.) while the Data Storage (implemented using SQLite) makes it possible to save the locations for later retrieval.

3.1 Data Model Design

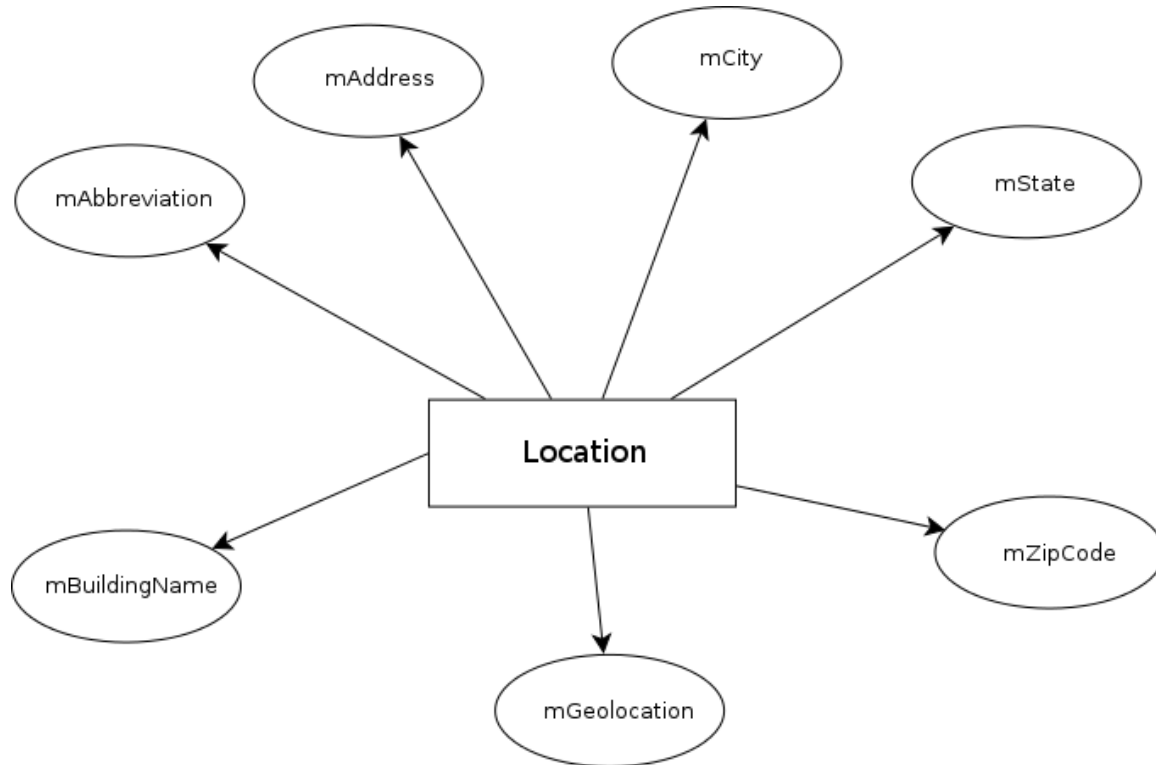


Figure 7: Location Data Model

3.1.1 Data Model Attributes

Name	Type	Description
mBuildingName	String	The name of the building
mAbbreviation	String	The abbreviation of the building
mAddress	String	The address of the building
mCity	String	The city of the building
mState	String	The state of the building
mZipCode	String	The zip code of the building
mGeolocation	String	The geographical location (latitude, longitude) of the building

3.2 Data Storage Design

Figure 8 illustrates the **SQLite** database model which communicates to the **SearchView** the results of possible matches to the query. Each release of the application will see a number of revisions to the data.

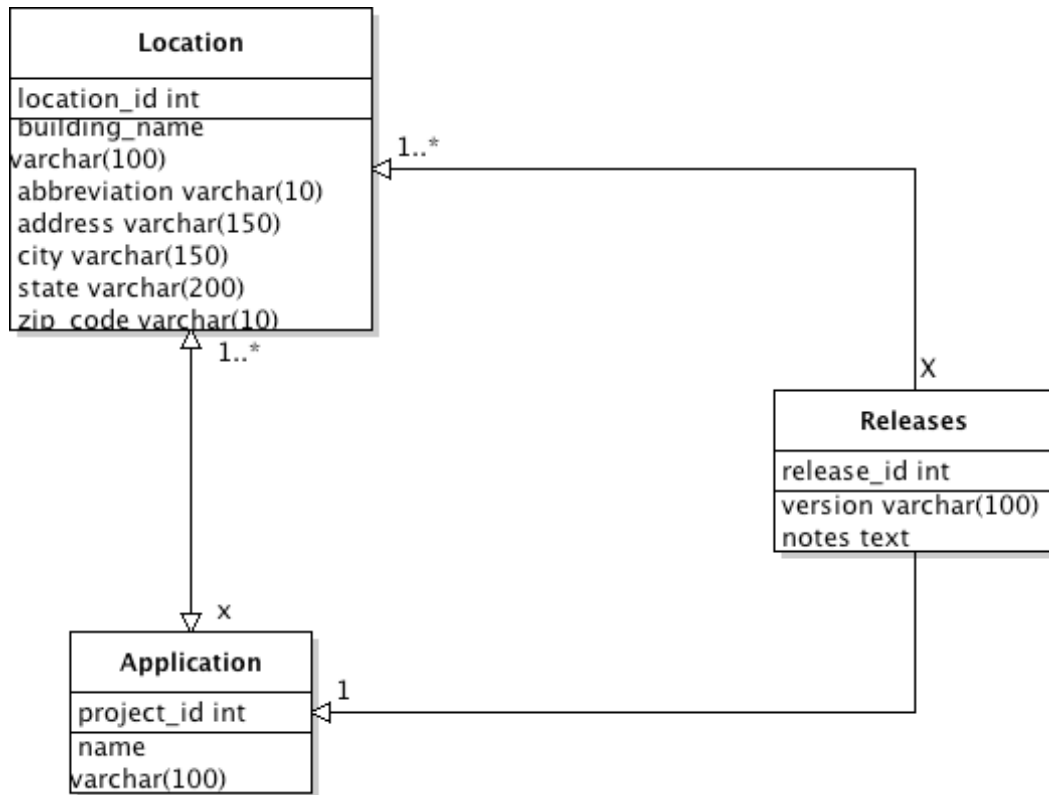


Figure 8: Data Storage (Table) Model

4. Application Design

Package com.android.templeuniversitymap.api

Interface Summary	
CampusConstants	This class contains constants used by the application.

Interface CampusConstants

↳ com.android.templeuniversitymap.api.ErrorReason

public interface **CampusConstants**

Field Summary	
static int	BUILDING_LATITUDE
static int	BUILDING_LONGITUDE
static int	BUILDING_NAME
static double	CENTER_MAP_LAT
static double	CENTER_MAP_LNG
static java.lang.String	QUERY_ALL
static double	START_POINT_LAT
static double	START_POINT_LNG
static int	ZOOM_LEVEL

Field Detail

ZOOM_LEVEL

static final int **ZOOM_LEVEL**

CENTER_MAP_LAT

static final double **CENTER_MAP_LAT**

CENTER_MAP_LNG

static final double **CENTER_MAP_LNG**

START_POINT_LAT

static final double **START_POINT_LAT**

START_POINT_LNG

static final double **START_POINT_LNG**

QUERY_ALL

static final java.lang.String **QUERY_ALL**

BUILDING_NAME

static final int **BUILDING_NAME**

BUILDING_LATITUDE

static final int **BUILDING_LATITUDE**

BUILDING_LONGITUDE

static final int **BUILDING_LONGITUDE**

Class Summary
ErrorReason - This class provides the reason an exception within the application was thrown.

Class ErrorReason

└ java.lang.Object

└ com.android.templeuniversitymap.api.ErrorReason

```
public class ErrorReason
extends java.lang.Object
```

Constructor Summary

ErrorReason()

Method Summary

Methods inherited from class java.lang.Object
--

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait
--

Constructor Detail

ErrorReason

public **ErrorReason()**

Creates a reason object to provide a detailed description of what might have caused the thrown exception.

Exception Summary

CampusException

Class CampusException

```
└ java.lang.Object
  └ java.lang.Throwable
    └ java.lang.Exception
      └ com.android.templeuniversitymap.api.CampusException
```

All Implemented Interfaces:

java.io.Serializable

```
public class CampusException
```

extends java.lang.Exception

Constructor Summary
CampusException()

Method Summary

Methods inherited from class java.lang.Throwable
fillInStackTrace, getCause, getLocalizedMessage, getMessage, getStackTrace, initCause, printStackTrace, printStackTrace, printStackTrace, setStackTrace, toString

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

CampusException

public **CampusException()**

Creates an exception object to handle thrown exceptions.

Package com.android.templeuniversitymap.db

Class Summary	
CampusDbHelper	CampusDbHelper
CampusLocationsDbAdapter	CampusLocationsDbAdapter
Record	Record

Class CampusDbHelper

```
└─ java.lang.Object
    └─ SQLiteOpenHelper
        └─ com.android.templeuniversitymap.db.CampusDbHelper
```

```
public class CampusDbHelper
extends SQLiteOpenHelper
implements CampusConstants
```

Field Summary

Fields inherited from interface com.android.templeuniversitymap.api.CampusConstants
--

BUILDING_LATITUDE, BUILDING_LONGITUDE, BUILDING_NAME, CENTER_MAP_LAT, CENTER_MAP_LNG, QUERY_ALL, START_POINT_LAT, START_POINT_LNG, ZOOM_LEVEL

Constructor Summary

CampusDbHelper(CampusLocationsDbAdapter locationsDbAdapter, Context context)
--

Method Summary	
-----------------------	--

java.util.Set<Record>	getDataset() Gets the dataset containing all records found in the database by iterating over the cursor returned by the database query.
-----------------------	--

SimpleCursorAdapter	getSimpleCursorAdapter(java.lang.String query) Gets an adapter that maps columns from a cursor to their corresponding TextViews defined in the location_search_result XML file.
void	onCreate(SQLiteDatabase db) Creates database instance by executing the SQL statement DATABASE_CREATE.
void	onUpgrade(SQLiteDatabase DB, int oldVersion, int newVersion) Called when the database needs to be upgraded.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CampusDbHelper

public CampusDbHelper(CampusLocationsDbAdapter locationsDbAdapter,
Context context)

Creates a helper object to create, open, and manage (i.e upgrade) the database.

Parameters:

locationsDbAdapter - Provides access to database adapter.

context - Interface to global information about application environment.

Method Detail

onCreate

public void onCreate(SQLiteDatabase db)

Creates database instance by executing the SQL statement DATABASE_CREATE. Called when the database is created for the first time.

Parameters:

db - SQLite database.

onUpgrade

public void onUpgrade(SQLiteDatabase DB, int oldVersion, int newVersion)

Called when the database needs to be upgraded.

Parameters:

db - SQLite database.

oldVersion - Old SQLite database.

newVersion - New SQLite database.

getSimpleCursorAdapter

public SimpleCursorAdapter getSimpleCursorAdapter(java.lang.String query)

Gets an adapter that maps columns from a cursor to their corresponding TextViews defined in the location_search_result XML file.

Parameters:

query - Query statement.

Returns: Returns a SimpleCursorAdapter instance which will be used to populate a ListView with the results returned by the database query.

getDataset

public java.util.Set<Record> getDataset()

Gets the dataset containing all records found in the database by iterating over the cursor returned by the database query.

Returns: Returns the set of aggregated records.

Class CampusLocationsDbAdapter

```
└ java.lang.Object
  └ com.android.templeuniversitymap.db.CampusLocationsDbAdapter
```

```
public class CampusLocationsDbAdapter
extends java.lang.Object
```

Field Summary	
static java.lang.String	DATABASE_CREATE

static java.lang.String	DATABASE_NAME
static int	DATABASE_VERSION
static java.lang.String	FTS_VIRTUAL_TABLE
static java.lang.String	KEY_ABBREVIATION
static java.lang.String	KEY_ADDRESS
static java.lang.String	KEY_BUILDING_NAME
static java.lang.String	KEY_CITY
static java.lang.String	KEY_LATITUDE
static java.lang.String	KEY_LONGITUDE
static java.lang.String	KEY_SEARCH
static java.lang.String	KEY_STATE
static java.lang.String	KEY_ZIP

Method Summary	
void	close()
boolean	deleteAllLocationRecords() Deletes all the location records found in the

	SQLite database.
CampusDbHelper	getCampusDbHelperInstance() Gets the database helper object.
static CampusLocationsDbAdapter	getDbAdapterInstance() Invokes the private constructor of the adapter if a instance has not been created; else gets the instance of the already instantiated adapter object.
CampusLocationsDbAdapter	open() Opens the database.
Cursor	searchFor(java.lang.String location) Gets the cursor after the database query string is built and executed on the SQLite database.
void	setContext(Context context) Sets the global information instance (context) about application environment.

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

DATABASE_NAME
public static final java.lang.String DATABASE_NAME

FTS_VIRTUAL_TABLE
public static final java.lang.String FTS_VIRTUAL_TABLE

DATABASE_VERSION
public static final int DATABASE_VERSION

KEY_BUILDING_NAME

public static final java.lang.String KEY_BUILDING_NAME

KEY_ABBREVIATION

public static final java.lang.String KEY_ABBREVIATION

KEY_ADDRESS

public static final java.lang.String KEY_ADDRESS

KEY_CITY

public static final java.lang.String KEY_CITY

KEY_STATE

public static final java.lang.String KEY_STATE

KEY_ZIP

public static final java.lang.String KEY_ZIP

KEY_LATITUDE

public static final java.lang.String KEY_LATITUDE

KEY_LONGITUDE

public static final java.lang.String KEY_LONGITUDE

KEY_SEARCH

public static final java.lang.String KEY_SEARCH

DATABASE_CREATE

public static final java.lang.String DATABASE_CREATE

Method Detail

getDbAdapterInstance

public static CampusLocationsDbAdapter getDbAdapterInstance()

Invokes the private constructor of the adapter if a instance has not been created; else gets the instance of the already instantiated adapter object.

Returns: Returns the adapter instance.

open

public CampusLocationsDbAdapter open()

throws SQLException

Opens the database.

Returns: Returns the database adapter object.

Throws: SQLException

close

public void close()

Closes database

searchFor

public Cursor searchFor(java.lang.String location)
throws SQLException

Gets the cursor after the database query string is built and executed on the SQLite database.

Parameters:

location - String representing of the location entered in the SearchView by the user.

Returns: Returns a cursor object that provides random read-write access to the result set returned by the database query.

Throws: SQLException

deleteAllLocationRecords

public boolean deleteAllLocationRecords()

Deletes all the location records found in the SQLite database.

Returns: Returns true if all records were deleted (see documentation on how records are deleted from a SQLite database through the use of the delete(String, String, String[]) method).

getCampusDbHelperInstance

public CampusDbHelper getCampusDbHelperInstance()

Gets the database helper object.

Returns: Returns a helper object to create, open, and manage (i.e upgrade) the database.

setContext

public void setContext(Context context)

Sets the global information instance (context) about application environment.

Parameters:

context - nterface to global information about application environment.

Class Record

```
└─ java.lang.Object
   └─ com.android.templeuniversitymap.db.Record
```

```
public class Record
extends java.lang.Object
```

Field Summary	
org.osmdroid.util.GeoPoint	buildingGeoPoint
java.lang.String	buildingName

Constructor Summary
Record(java.lang.String buildingName, java.lang.String latitude, java.lang.String longitude) Creates a record object representing a building (name and geopoint) in the database.

Method Summary

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

buildingName
public java.lang.String buildingName

buildingGeoPoint
public org.osmdroid.util.GeoPoint buildingGeoPoint

Constructor Detail

Record

public Record(java.lang.String buildingName, java.lang.String latitude,
java.lang.String longitude)
Creates a record object representing a building (name and geopoint) in the
database.

Parameters:

buildingName - Building name.
latitude - Building latitude.
longitude - Building longitude.

Package com.android.templeuniversitymap.ui

Class Summary	
DirectionsActivity	This class is the overall driver for the application. The class assigns listener to menu items need for user/system interaction, while also handling I/O requests and various invocations to classes and methods that are part of the applications functionality.
HelpActivity	This class allows the user to access the help page.

LayersActivity	This class allows the user to change visible layers on the map.
MapActivity	This class obtains the map from OSM and displays it for the user.
MyPlacesActivity	This class allows the user to access their saved history of locations.
SettingsActivity	This class allows the user to access settings for the application.

Class DirectionActivity

```

└─ java.lang.Object
    └─ Activity
        └─ com.android.templeuniversitymap.ui.DirectionActivity

```

```

public class DirectionActivity
extends Activity

```

Field Summary	
static java.lang.String	LOCATION_COOR

Constructor Summary
DirectionActivity()

Method Summary	
void	createRoute(View view) TODO add description
void	onCreate(Bundle savedInstanceState)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

LOCATION_COOR

public static final java.lang.String LOCATION_COOR

Constructor Detail

DirectionActivity

public DirectionActivity()

Method Detail

onCreate

public void onCreate(Bundle savedInstanceState)

createRoute

public void createRoute(View view)

Class HelpActivity

└ com.android.templeuniversitymap.HelpActivity

```
public class HelpActivity
extends java.lang.Object
```

Constructor Summary

HelpActivity()

Method Summary

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait
--

Constructor Detail

HelpActivity

public HelpActivity()

Class LayersActivity

└ com.android.templeuniversitymap.LayersActivity

```
public class LayersActivity  
extends java.lang.Object
```

Constructor Summary

LayersActivity()

Method Summary

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait
--

Constructor Detail

LayersActivity
public LayersActivity()

Class MapActivity

```

└─ java.lang.Object
    └─ Activity
        └─ com.android.templeuniversitymap.ui.MapActivity

```

```

public class MapActivity
    extends Activity
    implements org.osmdroid.views.util.constants.MapViewConstants,
        CampusConstants

```

Field Summary	
static java.lang.String	KEY_TUID

Fields inherited from interface org.osmdroid.views.util.constants.MapViewConstants

ANIMATION_DURATION_DEFAULT, ANIMATION_DURATION_LONG,
ANIMATION_DURATION_SHORT, ANIMATION_SMOOTHNESS_DEFAULT,
ANIMATION_SMOOTHNESS_HIGH, ANIMATION_SMOOTHNESS_LOW,
DEBUGMODE, MAXIMUM_ZOOMLEVEL, MINIMUM_ZOOMLEVEL, NOT_SET

Fields inherited from interface
com.android.templeuniversitymap.api.CampusConstants

BUILDING_LATITUDE, BUILDING_LONGITUDE, BUILDING_NAME,
CENTER_MAP_LAT, CENTER_MAP_LNG, QUERY_ALL,
START_POINT_LAT, START_POINT_LNG, ZOOM_LEVEL

Constructor Summary
MapActivity()

Method Summary	
void	onActivityResult(int requestCode, int resultCode, Intent data)
boolean	onClose()
void	onCreate(Bundle savedInstanceState)
boolean	onCreateOptionsMenu(Menu menu)
protected void	onDestroy()
void	onLocationChanged(Location location)
boolean	onOptionsItemSelected(MenuItem item)
void	onProviderDisabled(java.lang.String provider)
void	onProviderEnabled(java.lang.String provider)
boolean	onQueryTextChanged(java.lang.String text)
boolean	onQueryTextSubmit(java.lang.String query)
protected void	onStart()
void	onStatusChanged(java.lang.String provider, int status, Bundle extras)

Methods inherited from class java.lang.Object
clone, equals, finalize Field Detail , getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

KEY_TUID
public static final java.lang.String KEY_TUID

Constructor Detail

MapActivity
public MapActivity()

Method Detail

onCreate
public void onCreate(Bundle savedInstanceState)

onStart
protected void onStart()

onDestroy
protected void onDestroy()

onCreateOptionsMenu
public boolean onCreateOptionsMenu(Menu menu)

onOptionsItemSelected
public boolean onOptionsItemSelected(MenuItem item)

onActivityResult
public void onActivityResult(int requestCode, int resultCode, Intent data)

onClose
public boolean onClose()

onQueryTextSubmit
public boolean onQueryTextSubmit(java.lang.String query)

onQueryTextChange
public boolean onQueryTextChange(java.lang.String text)

onLocationChanged

public void onLocationChanged(Location location)

onProviderDisabled

public void onProviderDisabled(java.lang.String provider)

onProviderEnabled

public void onProviderEnabled(java.lang.String provider)

onStatusChanged

public void onStatusChanged(java.lang.String provider, int status, Bundle extras)

MyPlacesActivity

└─ java.lang.Object

└─ ListActivity

└─ com.android.templeuniversitymap.MyPlacesActivity

```
public class MyPlacesActivity
extends java.lang.Object
```

Constructor Summary
MyPlacesActivity()

Method Summary	
void	onCreate(Bundle savedInstanceState)

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

MyPlacesActivity
public MyPlacesActivity()

Method Detail

onCreate
public void onCreate(Bundle savedInstanceState)

Class SettingsActivity

└─ ListActivity
 └─ com.android.templeuniversitymap.SettingsActivity

```
public class SettingsActivity  
    extends ListActivity
```

Constructor Summary

SettingsActivity()

Method Summary	
void	onCreate(Bundle savedInstanceState)
void	onItemClick(adapterView, View view, int position, long id)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait
--

Constructor Detail

SettingsActivity
public SettingsActivity()

Method Detail

onCreate
public void onCreate(Bundle savedInstanceState)

onItemClick
public void onItemClick(AdapterView, View view, int position, long id)

Package com.android.templeuniversitymap.util

Class Summary	
CachedRoute	Stores a generated route for fast rendering.
CachedRouteAggregator	Contains a collection of stored routes.
CampusBuildingOverlay <Item extends OverlayItem>	Overlay which display on top of the map view all the buildings on campus.
CampusFoodOverlay	Overlay which display on top of the map view all the places to eat on campus.
CampusLocation	Denotes a location on campus.
CampusLocationAggregator	Contains a collection of campus locations.
CampusPath	Path overlay that display on top of the map view; denotes a route from two geolpoints.
CampusPathHelper	Helper class that manages the creation of a path.
GeolocationUpdateHandler	Provides updates to the users geolocation.

Class CachedRoute

└─ java.lang.Object
 └─ com.android.templeuniversitymap.util.CachedRoute

```
public class CachedRoute
    extends java.lang.Object
    implements java.io.Serializable
```

Constructor Summary

CachedRoute()

Method Summary

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait
--

Constructor Detail

CachedRoute

public CachedRoute()

Class CachedRouteAggregator

└─ java.lang.Object
 └─ com.android.templeuniversitymap.util.CachedRouteAggregator

```
public class CachedRouteAggregator
    extends java.lang.Object
```

Constructor Summary
CachedRouteAggregator()

Method Summary	
void	add(CachedRoute route)
void	get()

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CachedRouteAggregator
public CachedRouteAggregator()

Method Detail

add
public void add(CachedRoute route)

get
public void get()

Class CampusBuildingOverlay<Item extends
org.osmdroid.views.overlay.OverlayItem>
└─ java.lang.Object
 └─ org.osmdroid.views.overlay.Overlay
 └─ com.android.templeuniversitymap.util.
 CampusBuildingOverlay<Item>

```
public abstract class CampusBuildingOverlay<Item extends
org.osmdroid.views.overlay.OverlayItem>
extends org.osmdroid.views.overlay.Overlay
implements org.osmdroid.views.overlay.Overlay.Snappable
```

Nested Class Summary

Nested classes/interfaces inherited from class org.osmdroid.views.overlay.Overlay

org.osmdroid.views.overlay.Overlay.Snappable

Field Summary

protected Drawable

CampusMarker

protected boolean

mDrawFocusedItem

Fields inherited from class org.osmdroid.views.overlay.Overlay

mResourceProxy, mScale, SHADOW_X_SKEW, SHADOW_Y_SCALE

Fields inherited from interface org.osmdroid.views.util.constants.OverlayConstants

DEBUGMODE, DEFAULT_ZOOMLEVEL_MINIMAP_DIFFERENCE, NOT_SET

Constructor Summary

CampusBuildingOverlay(Drawable pDefaultMarker, org.osmdroid.ResourceProxy pResourceProxy)

Method Summary	
protected abstract Item	createItem(int i)
void	draw(Canvas arg0, org.osmdroid.views.MapView arg1, boolean arg2)
Item	getFocus()
Item	getItem(int position)
protected boolean	hitTest(Item item, android.graphics.drawable.Drawable marker, int hitX, int hitY)
protected void	onDrawItem(Canvas canvas, Item item, Point curScreenCoords)
protected void	populate()
void	setDrawFocusedItem(boolean drawFocusedItem)
void	setFocus(Item item)
abstract int	size()

Methods inherited from class org.osmdroid.views.overlay.Overlay
drawAt, getSafeMenuId, getSafeMenuIdSequence, isEnabled, onDetach, onDoubleTap, onDoubleTapEvent, onDown, onFling, onKeyDown, onKeyUp, onLongPress, onScroll, onShowPress, onSingleTapConfirmed, onSingleTapUp, onTouchEvent, onTrackballEvent, setEnabled

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface org.osmdroid.views.overlay.Overlay.Snappable
onSnapToItem

Field Detail

CampusMarker
protected final Drawable CampusMarker

mDrawFocusedItem
protected boolean mDrawFocusedItem

Constructor Detail

CampusBuildingOverlay
public CampusBuildingOverlay(Drawable pDefaultMarker,
org.osmdroid.ResourceProxy pResourceProxy)

Method Detail

createItem
protected abstract Item createItem(int i)

size
public abstract int size()

draw
public void draw(Canvas arg0, org.osmdroid.views.MapView arg1, boolean arg2)
Specified by:
draw in class org.osmdroid.views.overlay.Overlay

populate
protected final void populate()

getItem
public final Item getItem(int position)

onDrawItem
protected void onDrawItem(Canvas canvas, Item item, Point curScreenCoords)

hitTest

protected boolean hitTest(Item item, android.graphics.drawable.Drawable
marker, int hitX, int hitY)

setDrawFocusedItem
public void setDrawFocusedItem(boolean drawFocusedItem)

setFocus
public void setFocus(Item item)

getFocus
public Item getFocus()

Class CampusFoodOverlay

```
└─ java.lang.Object
    └─ org.osmdroid.views.overlay.Overlay
        └─ com.android.templeuniversitymap.util.CampusFoodOverlay
```

```
public class CampusFoodOverlay
extends org.osmdroid.views.overlay.Overlay
```

Nested Class Summary

Nested classes/interfaces inherited from class org.osmdroid.views.overlay.Overlay

org.osmdroid.views.overlay.Overlay.Snappable

Field Summary

Fields inherited from class org.osmdroid.views.overlay.Overlay

mResourceProxy, mScale, SHADOW_X_SKEW, SHADOW_Y_SCALE

Fields inherited from interface org.osmdroid.views.util.constants.OverlayConstants

DEBUGMODE, DEFAULT_ZOOMLEVEL_MINIMAP_DIFFERENCE, NOT_SET

Constructor Summary

CampusFoodOverlay(Context context, java.util.ArrayList<CampusLocation> campusLocations)

Method Summary	
protected void	draw(Canvas arg0, org.osmdroid.views.MapView arg1, boolean arg2)
void	onSharedPreferenceChanged(SharedPreferences sharedPreferences, java.lang.String key)

Methods inherited from class org.osmdroid.views.overlay.Overlay

drawAt, getSafeMenuId, getSafeMenuIdSequence, isEnabled, onDetach, onDoubleTap, onDoubleTapEvent, onDown, onFling, onKeyDown, onKeyUp, onLongPress, onScroll, onShowPress, onSingleTapConfirmed, onSingleTapUp, onTouchEvent, onTrackballEvent, setEnabled

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CampusFoodOverlay
public CampusFoodOverlay(Context context,
 java.util.ArrayList<CampusLocation> campusLocations)

Method Detail

Draw

protected void draw(Canvas arg0,
 org.osmdroid.views.MapView arg1,
 boolean arg2)

Specified by:

draw in class org.osmdroid.views.overlay.Overlay

onSharedPreferencesChanged

public void onSharedPreferencesChanged(SharedPreferences
sharedPreferences, java.lang.String key)

Class CampusLocation

└ java.lang.Object
 └ com.android.templeuniversitymap.util.CampusLocation

public class CampusLocation
extends java.lang.Object

Constructor Summary

CampusLocation(java.lang.String buildingName, java.lang.String abbreviation,
java.lang.String address, java.lang.String city, java.lang.String state, java.lang.String
zipCode, java.lang.String latitude, java.lang.String longitude)

Method Summary

java.lang.String

getAbbreviation()

java.lang.String	getAddress()
java.lang.String	getBuildingName()
java.lang.String	getCity()
java.lang.String	getLatitude()
java.lang.String	getLongitude()
java.lang.String	getState()
java.lang.String	getZipCode()

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CampusLocation

```
public CampusLocation(java.lang.String buildingName,  
    java.lang.String abbreviation,  
    java.lang.String address,  
    java.lang.String city,  
    java.lang.String state,  
    java.lang.String zipCode,  
    java.lang.String latitude,  
    java.lang.String longitude)
```

Method Detail

getBuildingName

public java.lang.String getBuildingName()
Returns:

getAbbreviation
public java.lang.String getAbbreviation()
Returns:

getAddress
public java.lang.String getAddress()
Returns:

getCity
public java.lang.String getCity()
Returns:

getState
public java.lang.String getState()
Returns:

getZipCode
public java.lang.String getZipCode()
Returns:

getLatitude
public java.lang.String getLatitude()
Returns:

getLongitude
public java.lang.String getLongitude()
Returns:

Class CampusLocationAggregator

└ java.lang.Object
 └ com.android.templeuniversitymap.util.CampusLocationAggregator

```
public class CampusLocationAggregator  
extends java.lang.Object
```

Constructor Summary

CampusLocationAggregator()

Method Summary	
void	add()

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CampusLocationAggregator
public CampusLocationAggregator()

Method Detail

add
public void add()

Class CampusPath

```
└ java.lang.Object
  └ org.osmdroid.views.overlay.Overlay
    └ org.osmdroid.views.overlay.PathOverlay
      └ com.android.templeuniversitymap.util.CampusPath
```

```
public class CampusPath
extends org.osmdroid.views.overlay.PathOverlay
```

Nested Class Summary

Nested classes/interfaces inherited from class org.osmdroid.views.overlay.Overlay

org.osmdroid.views.overlay.Overlay.Snappable

Field Summary	
static double	MICRODEGREES_COEFF

Fields inherited from class org.osmdroid.views.overlay.PathOverlay
mPaint

Fields inherited from class org.osmdroid.views.overlay.Overlay
mResourceProxy, mScale, SHADOW_X_SKEW, SHADOW_Y_SCALE

Fields inherited from interface org.osmdroid.views.util.constants.OverlayConstants
DEBUGMODE, DEFAULT_ZOOMLEVEL_MINIMAP_DIFFERENCE, NOT_SET

Constructor Summary
CampusPath(Context context)

Method Summary	
static java.lang.String	requestUrlConnection(java.lang.String serviceUrl, java.lang.String serviceCharset)
void	setEndLatitude(double endLatitude)

void	setEndLongitude(double endLng)
void	setGeopoints(java.util.ArrayList<Point> points)
void	setUserTUID(java.lang.String TUID)
void	showPathFrom(double startLatitude, double startLongitude)

Methods inherited from class org.osmdroid.views.overlay.PathOverlay
addGreatCircle, addGreatCircle, addPoint, addPoint, clearPath, draw, getNumberOfPoints, getPaint, setAlpha, setColor, setPaint

Methods inherited from class org.osmdroid.views.overlay.Overlay
drawAt, getSafeMenuId, getSafeMenuIdSequence, isEnabled, onDetach, onDoubleTap, onDoubleTapEvent, onDown, onFling, onKeyDown, onKeyUp, onLongPress, onScroll, onShowPress, onSingleTapConfirmed, onSingleTapUp, onTouchEvent, onTrackballEvent, setEnabled

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

MICRODEGREES_COEFF

public static final double MICRODEGREES_COEFF
See Also:
Constant Field Values

Constructor Detail

CampusPath

public CampusPath(Context context)
Parameters:
context –

Method Detail

showPathFrom

public void showPathFrom(double startLatitude, double startLongitude)
throws java.lang.Exception
Parameters:
startLatitude -
startLongitude -
Throws:
java.lang.Exception

requestUrlConnection

public static java.lang.String requestUrlConnection(java.lang.String serviceUrl,
java.lang.String serviceCharset)
throws java.lang.Exception

Parameters:
serviceUrl -
serviceCharset -
Returns:
Throws:
java.lang.Exception

setUserTUID

public void setUserTUID(java.lang.String TUID)
Parameters:
TUID -

setGeopoints

```
public void setGeopoints(java.util.ArrayList<Point> points)
```

Parameters:

points -

```
setEndLatitude
```

```
public void setEndLatitude(double endLatitude)
```

Parameters:

endLatitude -

```
setEndLongitude
```

```
public void setEndLongitude(double endLng)
```

Parameters:

endLng -

Class CampusPathHelper

```
└ java.lang.Object
```

```
└ com.android.templeuniversitymap.util.CampusPathHelper
```

```
public class CampusPathHelper
```

```
extends java.lang.Object
```

```
implements CampusConstants
```

Field Summary

Fields inherited from interface

com.android.templeuniversitymap.api.CampusConstants

BUILDING_LATITUDE, BUILDING_LONGITUDE, BUILDING_NAME,
CENTER_MAP_LAT, CENTER_MAP_LNG, QUERY_ALL,
START_POINT_LAT, START_POINT_LNG, ZOOM_LEVEL

Constructor Summary

CampusPathHelper(Context context, org.osmdroid.views.MapView mapView)
Class constructor.

Method Summary	
CampusPath	route(java.lang.String endLatitude, java.lang.String endLongitude) Routes a path from the users geolocation to a campus location.
CampusPath	route(java.lang.String startLatitude, java.lang.String startLongitude, java.lang.String endLatitude, java.lang.String endLongitude) Routes a path from two predefined static locations on campus.
void	setUserGeolocation(double startLatitude, double startLongitude) Sets the users geolocation as the starting point of route.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

CampusPathHelper

```
public CampusPathHelper(Context context,
    org.osmdroid.views.MapView mapView)
```

Class constructor.

Parameters:

context –

Method Detail

route

```
public CampusPath route(java.lang.String startLatitude,
    java.lang.String startLongitude,
    java.lang.String endLatitude,
```

`java.lang.String endLongitude)`

Routes a path from two predefined static locations on campus.

Parameters:

`startLatitude` - Latitude of starting location

`startLongitude` - Longitude of starting location

`endLatitude` - Latitude of ending location

`endLongitude` - Longitude of ending location

Returns:

- generated campuspath overlay that will be added to the mapview

`route`

`public CampusPath route(java.lang.String endLatitude,
java.lang.String endLongitude)`

Routes a path from the users geolocation to a campus location.

Parameters:

`endLatitude` - Latitude of ending location

`endLongitude` - Longitude of ending location

Returns:

- generated campuspath overlay that will be added to the mapview

`setUserGeolocation`

`public void setUserGeolocation(double startLatitude,
double startLongitude)`

Sets the users geolocation as the starting point of route.

Parameters:

`startLatitude` -

`startLongitude` -

Class GeolocationUpdateHandler

└ `java.lang.Object`

└ `com.android.templeuniversitymap.util.GeolocationUpdateHandler`

`public class GeolocationUpdateHandler
extends java.lang.Object`

Constructor Summary

<code>GeolocationUpdateHandler()</code>

Method Summary	
void	onLocationChanged(Location location)
void	onProviderDisabled(java.lang.String provider)
void	onProviderEnabled(java.lang.String provider)
void	onStatusChanged(java.lang.String provider, int status, Bundle extras)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

GeolocationUpdateHandler
public GeolocationUpdateHandler()

Method Detail

onLocationChanged
public void onLocationChanged(Location location)

onProviderDisabled
public void onProviderDisabled(java.lang.String provider)

onProviderEnabled
public void onProviderEnabled(java.lang.String provider)

onStatusChanged
public void onStatusChanged(java.lang.String provider, int status, Bundle extras)

5. References

<http://developer.android.com/reference/android/app/Activity.html>
<http://developer.android.com/reference/android/view/View.html>
<http://developer.android.com/guide/components/fundamentals.html>
<http://developer.android.com/reference/android/content/Intent.html>
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<http://developer.android.com/reference/android/database/sqlite/package-summary.html>
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<http://developer.android.com/guide/topics/data/index.html>
<http://developer.android.com/guide/topics/data/data-storage.html#db>

5.1 Tool Used to Create Diagrams

5.1.1 UML Modeling Tool

Violet – Version 0.21.1, <http://horstmann.com/violet/>

5.1.2 Entity Relationship Diagramming Tool

Dia – Version 0.95, <http://live.gnome.org/Dia>