Name of Experiment: Geo-Coordinate using Map	**Exp No:** MC8

Background: Student should have basic knowledge of C#.

Summary: People are very much curious about finding their own location on the digital map. A-GPS technology has solved this problem to far extent using several services provided by google maps, bing maps etc. We need to map our geo-coordinate points on the digital map by using pushpins or some marker.

Learning Objective: Using previous experiment (MC4 i.e. My Location) you can able to fetch the geo-coordinates. Now, in this experiment student should able to learn the activity of calling digital map on the mobile device and draw his geo-coordinate on it.

Target Platforms: This experiment is tested on Windows Emulator and Nokia Lumia 800.

Procedure:

Step 1. Repeat steps [1-4] as in experiment no MC1[Hello World].

Step 2. Add Reference to System.Device.Location and Microsoft.Phone.Controls.Map.

Step 3. Initialise the GeoCoordinateWatcher as myWatcher=new GeoCoordinateWatcher().

Step 4. Call the Position Changed Event.

Step 5. Define the body for PositionChangedEvent and pass the GeoCoordinate to the center of the map.[Refer Source code section]

Step 6. Add buttonRoad click event, buttonArial click event, buttonZoomIn click event and button and buttonZoomOut click event.

Step 7. Define the body of each click handler.[Refer source code section]

Step 8. Save all the changes made to the project.

Step 9. Press F5, to debug the experiment on Windows Emulator.

Step 10. By this way, we can deploy the experiment on Windows Emulator.

*Note Get the Bing Map Key by registering your app with the Bing Map.

Source Code	Comments

MainPage.xaml

```
<!--LayoutRoot is the root grid where all page content is
placed-->
    <Grid x:Name="LayoutRoot" Background="Transparent">
        <Grid.RowDefinitions>
            <RowDefinition Height="Auto"/>
            <RowDefinition Height="*"/>
        </Grid.RowDefinitions>
```

```
        <!--TitlePanel contains the name of the
application and page title-->
        <StackPanel x:Name="TitlePanel" Grid.Row="0"
Margin="12,17,0,28">
            <TextBlock x:Name="ExperimentTitle"
Text="ExpNo MC8" TextAlignment="Right"
Style="{StaticResource PhoneTextNormalStyle}"/>
            <TextBlock x:Name="ApplicationTitle"
Text="Mobile Computing" Style="{StaticResource
PhoneTextNormalStyle}"/>
            <TextBlock x:Name="PageTitle" Text="Geo-
Coordinates using Map" Margin="9,-7,0,0"
Style="{StaticResource PhoneTextTitle1Style}"/>
        </StackPanel>

        <!--ContentPanel - place additional content here--
>
        <Grid x:Name="ContentPanel" Margin="12,149,12,12"
Grid.RowSpan="2">
            <my:Map Height="462" CredentialsProvider="Your
Bing Map Key"
HorizontalAlignment="Left" Margin="6,6,0,0" Name="map1"
VerticalAlignment="Top" Width="444" />

            <Button Content="Road Mode" Height="72"
HorizontalAlignment="Left" Margin="6,474,0,0"
Name="buttonRoad" VerticalAlignment="Top" Width="207"
Click="buttonRoad_Click" />
            <Button Content="Aerial Mode" Height="72"
HorizontalAlignment="Left" Margin="243,474,0,0"
Name="buttonAerial" VerticalAlignment="Top" Width="207"
Click="buttonAerial_Click" />
            <Button Content="Zoom In" Height="72"
HorizontalAlignment="Left" Margin="6,535,0,0"
Name="buttonZoomIn" VerticalAlignment="Top" Width="207"
Click="buttonZoomIn_Click" />
            <Button Content="Zoom Out" Height="72"
HorizontalAlignment="Left" Margin="243,535,0,0"
Name="buttonZoomOut" VerticalAlignment="Top" Width="207"
Click="buttonZoomOut_Click" />
        </Grid>
    </Grid>
```

← Exp No MC8(Experiment Title)

←Mobile Computing (Application Title)
←Geo-Coordinates using Map(Page Title)

←map1(Name)
*Get the Bing Map Key

← Road Mode(button)

←Aerial Mode (button)

←Zoom In(button)

←Zoom Out(button)

MainPage.xaml.cs

```
using System;
using System.Windows;
using Microsoft.Phone.Controls.Maps;
using Microsoft.Phone.Controls;
using System.Device.Location;

namespace MobileComputingTest
{
    public partial class MainPage : PhoneApplicationPage
    {
        GeoCoordinateWatcher myWatcher;
        // Constructor
        public MainPage()
        {
            InitializeComponent();
            myWatcher = new GeoCoordinateWatcher();
            myWatcher.Start();
            myWatcher.PositionChanged+=new
```

←Add Reference Microsoft.Phone.Controls.Maps and System.Device.Location

Instantiate GeoCoordinateWatcher

```
EventHandler<GeoPositionChangedEventArgs
<GeoCoordinate>>(myWatcher_PositionChanged);
        }

        private void myWatcher_PositionChanged(object
sender, GeoPositionChangedEventArgs<GeoCoordinate> e) {
   ApplicationTitle.Text = String.Format("Latitude:{0},
Longitude:{1}",e.Position.Location.Latitude,
e.Position.Location.Longitude);
            map1.Center = new
GeoCoordinate(e.Position.Location.Latitude,
e.Position.Location.Longitude);
  map1.ZoomLevel = 6;
Pushpin pin = new Pushpin();
            pin.Location = new
GeoCoordinate(e.Position.Location.Latitude,
e.Position.Location.Longitude);
        map1.Children.Add(pin);

        }
private void buttonRoad_Click(object sender,
RoutedEventArgs e)
        {
    map1.Mode = new RoadMode();
            //map1.Center = new GeoCoordinate();

        }

 private void buttonAerial_Click(object sender,
RoutedEventArgs e)
        {
      map1.Mode = new AerialMode();
        }

  private void buttonZoomIn_Click(object sender,
RoutedEventArgs e)
        {
            double zoom;
            zoom = map1.ZoomLevel;
            map1.ZoomLevel = ++zoom;

        }

private void buttonZoomOut_Click(object sender,
RoutedEventArgs e)
        {
            double zoom;
            zoom=map1.ZoomLevel;
            map1.ZoomLevel = --zoom;
        }
    }
}
```

← Body of myWatcher_PositionChanged(){}
← Priniting Geocoordinate

← Setting the GeoCoordinate on the Map

←Displaying RoadMode() view on the Map.

←Displaying AerialMode() view on the Map.

← Zoom-In the Map

← Zoom-Out the Map

Screenshots:

Fig No. 1 Home Screen(Road Mode View)

Fig No. 2 Aerial Mode View

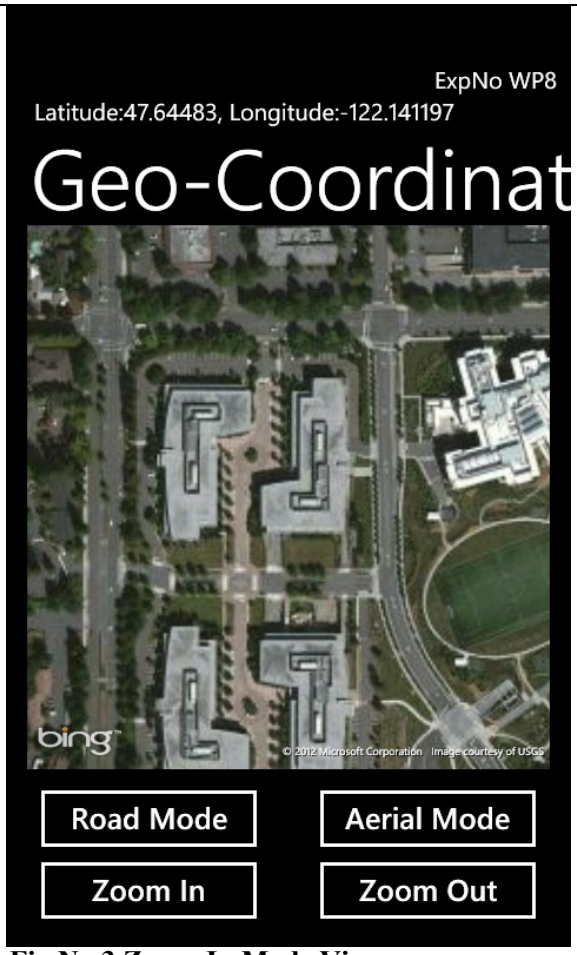

Fig No 3 Zoom-In Mode View

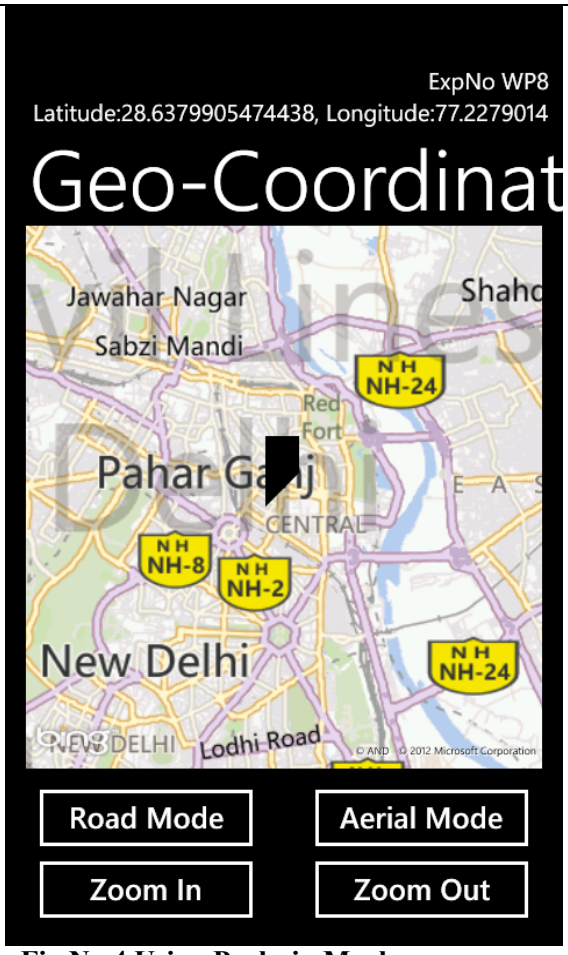

Fig No 4 Using Pushpin Marker

Observations: It is observed by developer that using this experiment we are able to draw our geo-coordinates on the digital map.