AutoRepair App

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ACKNOWLEDGEMENT

We would like to take this opportunity to express our profound gratitude to our Microsoft mentors, Mr. Sanklan Saxena and Mr. Rohit Singh for their exemplary guidance, monitoring and constant encouragement throughout the course of the Campus Connect Programme. Their extensive knowledge and constant availability has helped us plan our project right to its completion through the various stages.

We would also like to profoundly thank our VIT mentor, Mr. Lakshmanna K, who gave us the necessary push to complete our project and because of whom, we understand and appreciate this huge opportunity that Microsoft has given us.

We are also highly obliged to Dr. Pradeep Reddy CH and the Microsoft Innovation Center team, who have been a valuable facilitator in providing us this opportunity.

PROBLEM STATEMENT

Consider a situation where a person is travelling on the road and his/her car breaks down in the middle of nowhere. The person has no contacts to any automobile repair shop and no cellular data. What should he do?
Or consider that this person's car is very low on petroleum and the only petrol station the person knows of is out of the way. The person is on a schedule to reach a destination. How would he/she find the closest petroleum station?

INTRODUCTION

The AutoRepair application is aimed to be a universal application that enables the user either to, choose a starting point and a destination to display the shortest route possible along with AutoRepair facilities along the way.

It also gathers their current location and finds shops present within a circular radius of 1.6kms. The nearby help facilities are displayed by passing the longitudes and latitudes of the current location, creating a circular perimeter, running through the local data created before when entering the starting and ending locations and matching those coordinates within the defined circular perimeter to find nearby shops.

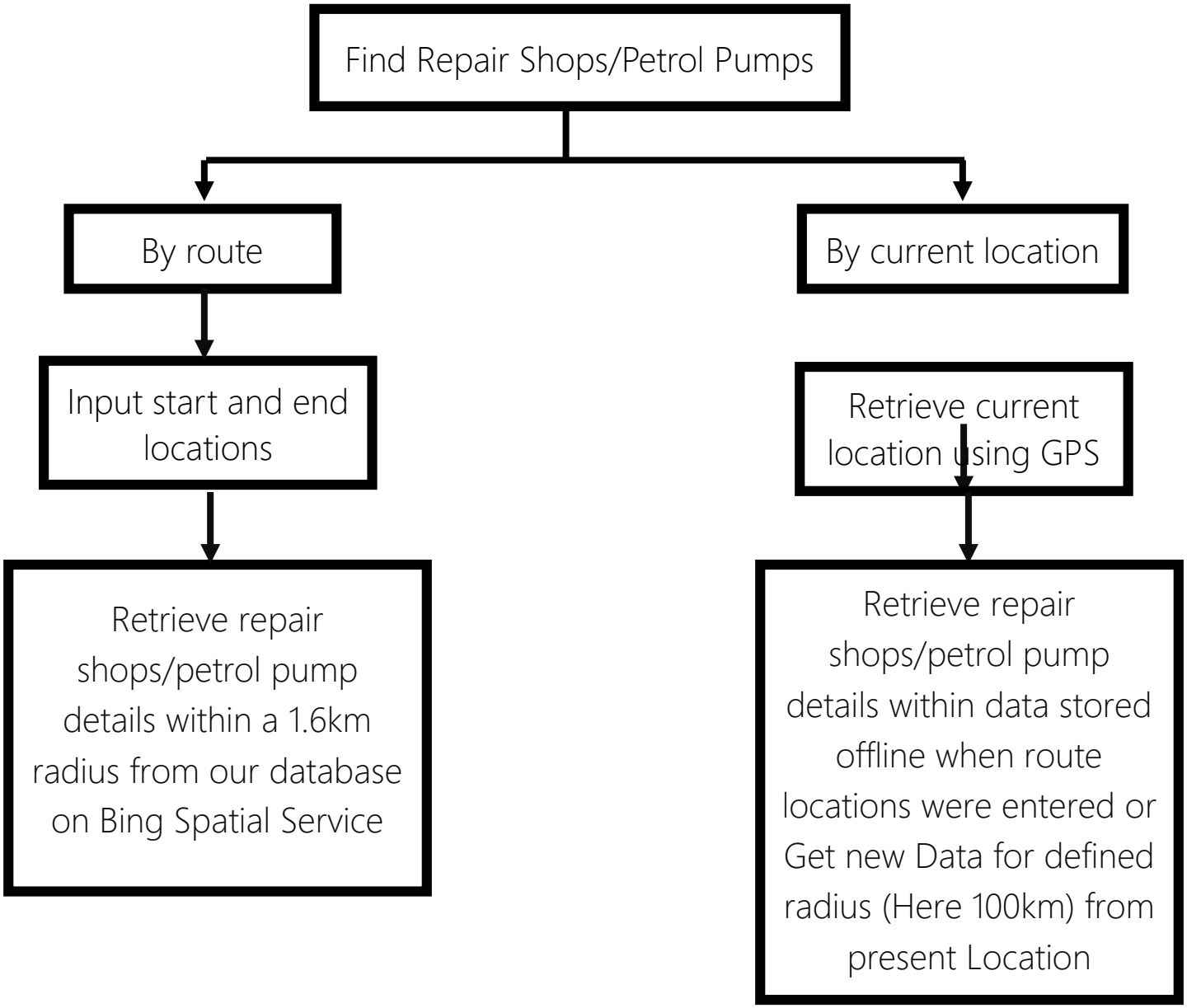
MOTIVATION

The number of situations when a car breaks down, meets with an accident or is low on petrol is countless. According to AA, breakdowns are commonly caused by flat batteries, punctured tyres, lack of fuel, engine problems or light problems.

Accidents on the road are very common and it is our duty as citizens and people of tomorrow to come up with ideas to implement that would help prevent such risks and make the roads safe for everyone.

The motivation behind building this application is the lack of options a person has in case of vehicle breakdown. If only there were a way of getting to know of the nearest gas stations and repair shops in a situation where you have no connectivity due to bad network receptivity. We hope that through our app no person will ever be in a helpless situation on the road.

ARCHITECTURE



- First of all the user needs to select the operation on the Start screen, whether to find shops by route or by given location.
- If they chooses the former, the user has to input the start and the end locations of his journey and click on the submit button.
- Else if the user needs shops near his current location, he can click on Use my location to be rerouted to shops on the map.
- The user can get details of the desired shop or hotel etc. by tapping on the repair shop displayed below the map and the contact details of the nearest desired location will be displayed.

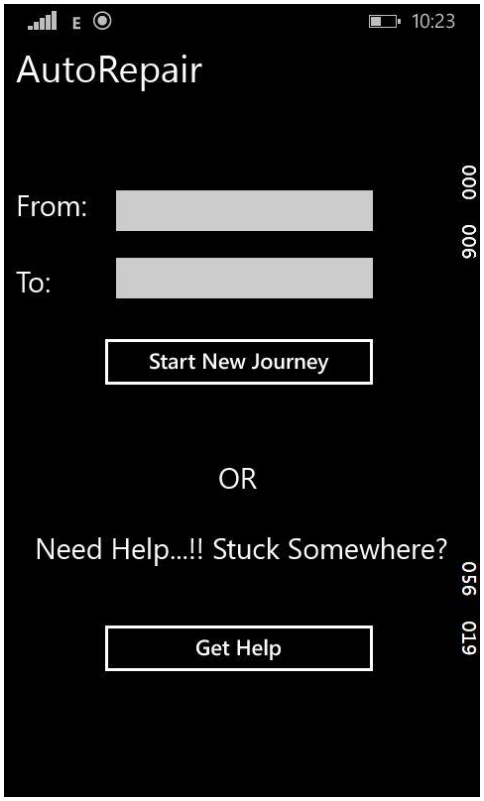
ARCHITECTURE SCOPE

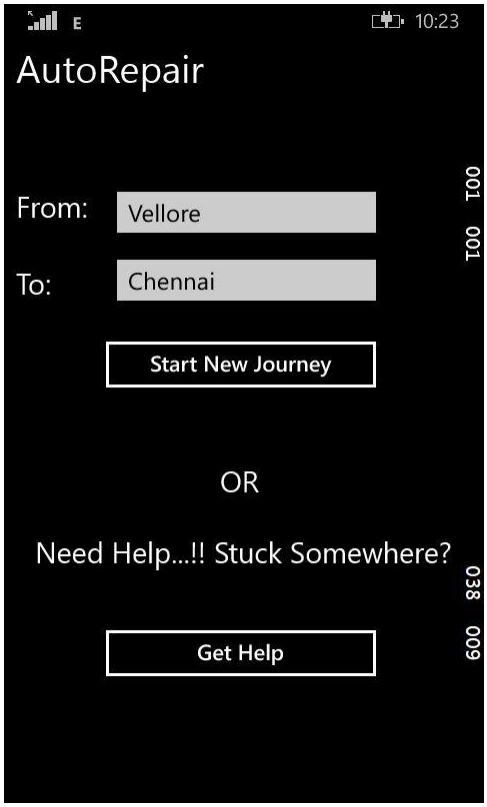
The implementation of the architecture is limited to the Prototype Data [including our own location coordinates for Repair Shops and Petrol Pumps for the test cases]. The project if or when carried forward can use a database of all the repair shops and petrol pumps over the world.

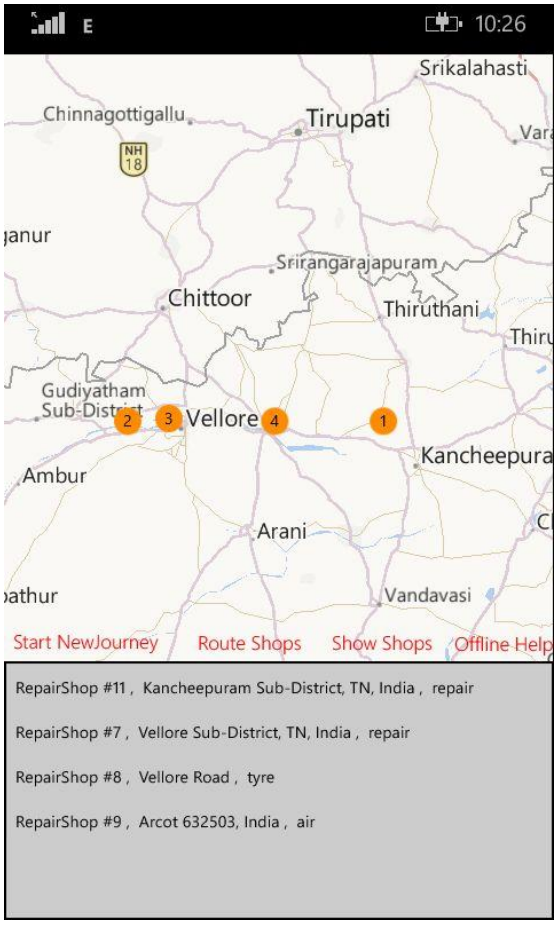
IMPLEMENTATION

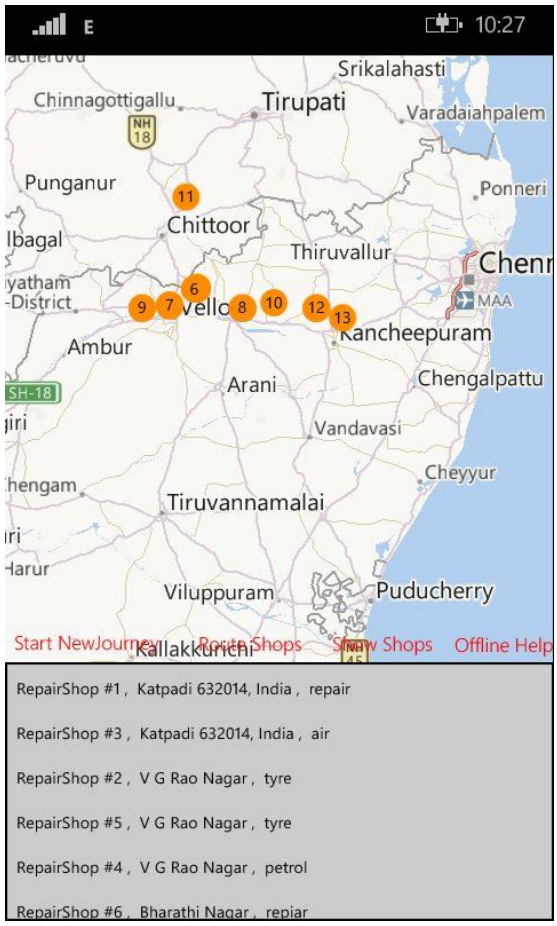
- Visual Studio Professional 2013.
- Bing Maps API: Rest API and Spatial services API – Bing Maps Portal.
- C#, XAML, Windows Phone Maps.

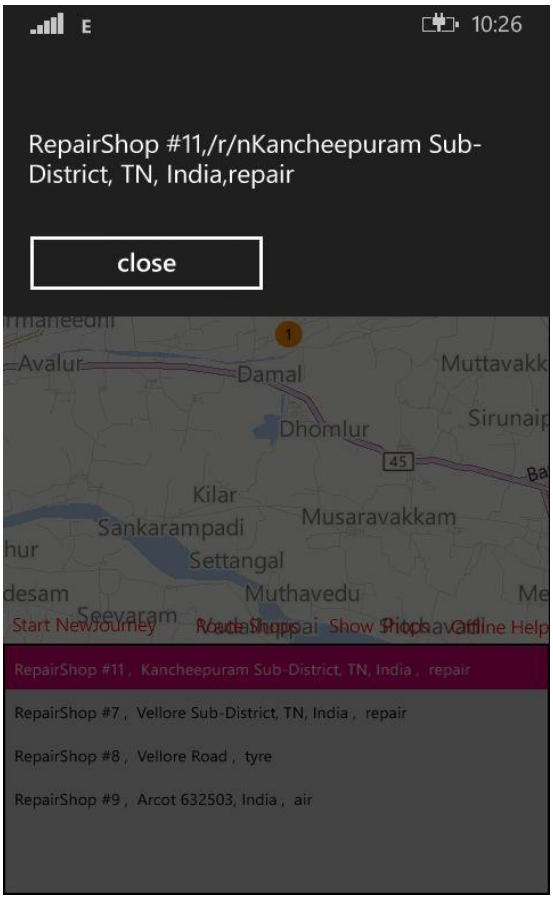
DESIGN

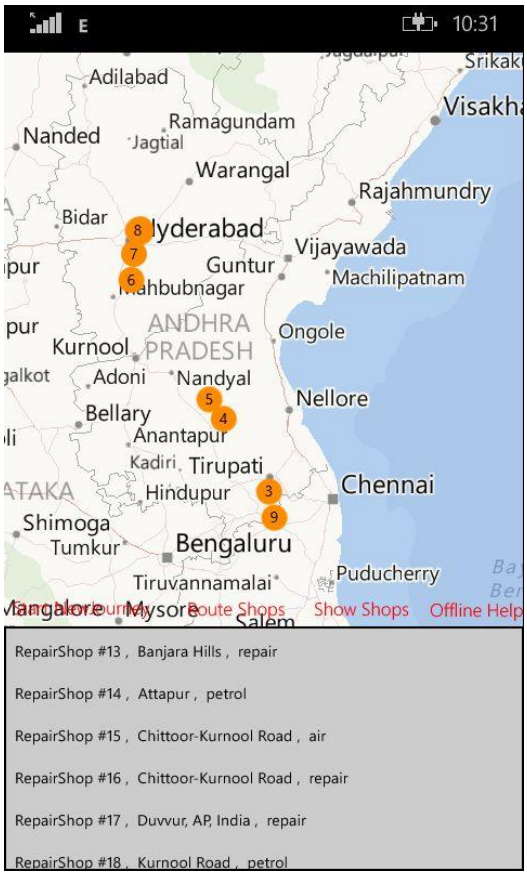

10:23
AutoRepair
From:
To:
Start New Journey
OR
Need Help...!! Stuck Somewhere?
Get Help


10:23
AutoRepair
From:
Vellore
To:
Chennai
Start New Journey
OR
Need Help...!! Stuck Somewhere?
Get Help


E
10:26
Srikalahasti
Chinnagottigallu
Tirupati
NH 18
Srirangarajapuram
Chittoor
Thiruthani
Gudiyatham Sub-District
2
3
Vellore
4
1
Kancheepura
Ambur
Arani
Vandavasi
Start NewJourney
Route Shops
Show Shops
Offline Help
RepairShop #11 , Kancheepuram Sub-District, TN, India , repair
RepairShop #7 , Vellore Sub-District, TN, India , repair
RepairShop #8 , Vellore Road , tyre
RepairShop #9 , Arcot 632503, India , air

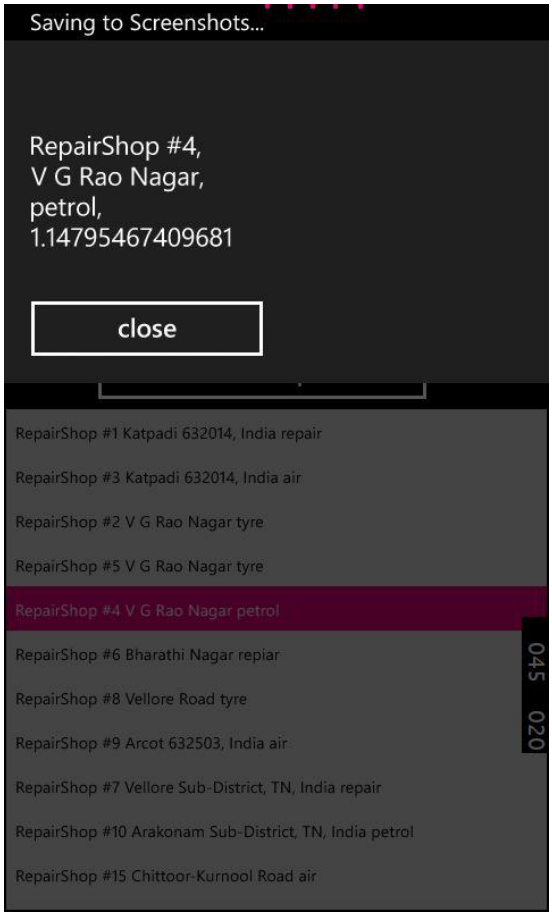

E
10:27
Srikalahasti
Chinnagottigallu
Tirupati
Varadaiahpalem
NH 18
Punganur
Ponneri
11
Chittoor
Thiruvallur
6
9
7
8
10
12
13
MAA
Ambur
Kancheepuram
Chengalpattu
SH-18
Arani
Vandavasi
Cheyyur
Tiruvannamalai
Viluppuram
Puducherry
Start NewJourney
Route Shops
Show Shops
Offline Help
RepairShop #1 , Katpadi 632014, India , repair
RepairShop #3 , Katpadi 632014, India , air
RepairShop #2 , V G Rao Nagar , tyre
RepairShop #5 , V G Rao Nagar , tyre
RepairShop #4 , V G Rao Nagar , petrol
RepairShop #6 , Bharathi Nagar , repiar


E
10:26
RepairShop #11,/r/nKancheepuram Sub-District, TN, India,repair
close
Avalur
Damal
Muttavakk
Dhomlur
Sirunaip
45
Kilar
Sankarampadi
Musaravakkam
Settangal
Muthavedu
Seevaram
Start NewJourney
Show Shops
Offline Help
RepairShop #11 , Kancheepuram Sub-District, TN, India , repair
RepairShop #7 , Vellore Sub-District, TN, India , repair
RepairShop #8 , Vellore Road , tyre
RepairShop #9 , Arcot 632503, India , air


E
10:31
Adilabad
Ramagundam
Nanded
Jagtial
Warangal
Rajahmundry
Visakha
Bidar
Hyderabad
Vijayawada
Guntur
Machilipatnam
Mahbubnagar
ANDHRA PRADESH
Ongole
Kurnool
Adoni
Nandyal
Nellore
Bellary
Anantapur
Kadiri
Tirupati
Chennai
Hindupur
Shimoga
Tumkur
Bengaluru
Puducherry
Tiruvannamalai
Mysore
Show Shops
Offline Help
RepairShop #13 , Banjara Hills , repair
RepairShop #14 , Attapur , petrol
RepairShop #15 , Chittoor-Kurnool Road , air
RepairShop #16 , Chittoor-Kurnool Road , repair
RepairShop #17 , Duvvur, AP, India , repair
RepairShop #18 , Kurnool Road , petrol


E
10:29
To Use this service you need to have INTERNET for the first time
To Download Data Press Button Below
Get Shop Details
002
003
To Get shop details around you press Help
Get Help
043
009


E
10:29
To Use this service you need to have INTERNET for the first time
To Download Data Press Button Below
Get Shop Details
001
005
To Get shop details around you press Help
Get Help
RepairShop #1 Katpadi 632014, India repair
RepairShop #3 Katpadi 632014, India air
RepairShop #2 V G Rao Nagar tyre
RepairShop #5 V G Rao Nagar tyre
RepairShop #4 V G Rao Nagar petrol
RepairShop #6 Bharathi Nagar repiar
RepairShop #8 Vellore Road tyre
RepairShop #9 Arcot 632503, India air
RepairShop #7 Vellore Sub-District, TN, India repair
RepairShop #10 Arakonam Sub-District, TN, India petrol
RepairShop #15 Chittoor-Kurnool Road air
034
024



MODULES

- Map Service / Bing Map Rest Service – To Geocode and Get Data for Routes etc.

MyMap.center()

Mymap.zoomlevel()

MapIcon()

MapControl

Pushpin()

Route request (Bing Rest Route API) –

http://dev.virtualearth.net/REST/V1/Routes/Walking?wp.0=Eiffel%20Tower&wp.1=louvre%20museum&optmz=distance&output=json&key=BingMapsKey

Location Request (Bing Rest Location API)-
http://dev.virtualearth.net/REST/v1/Locations?q=100%20Main%20St.%20Somewhere,%20WA%2098001&key=BingMapsKey

Query By Area (Bing Spatial Query API) –

http://spatial.virtualearth.net/REST/v1/data/20181f26d9e94c81acdf9496133d4f23/FourthCoffeeSample/FourthCoffeeShops?spatialFilter=bbox(40.7801465817126,-74.46958923339845,40.88535150706938,-74.163070678710937)&$select=EntityID,Latitude,Longitude&$top=3&$format=json&key=queryKey

Query Along A Route –

http://spatial.virtualearth.net/REST/v1/data/20181f26d9e94c81acdf9496133d4f23/FourthCoffeeSample/FourthCoffeeShops?spatialFilter=nearRoute('Webster,TX','Kemah,TX')&$select=EntityID,Latitude,Longitude,DisplayName,Phone&$top=3&$format=json&key=queryKey

- Geolocator Class – to Get Current Location.

```
{
Geolocator geolocator = new Geolocator();
Geoposition geoposition = await geolocator.GetGeopositionAsync();

SearchLatitude = geoposition.Coordinate.Latitude;
SearchLongitude = geoposition.Coordinate.Longitude;
}
```

- Json Data – Serializing and Deserializing.

Serializing Data To Json.

```
string jsonContents = JsonConvert.SerializeObject(obj);
```

DeSerializing the Response obtained

```
string responsetext = await response.Content.ReadAsStringAsync();
obj = JsonConvert.DeserializeObject<shopsdata.restObj>(responsetext);
```

- Storage Folder/Storage File – to Store in Local storage.

Storing data in Local file-

```
// Get the app data folder and create or replace the file we are storing the
JSON in.
StorageFolder localFolder = ApplicationData.Current.LocalFolder;
StorageFile textFile = await
localFolder.CreateFileAsync("a.txt",CreationCollisionOption.ReplaceExisting);

// Open the file...
using (IRandomAccessStream textStream = await
textFile.OpenAsync(FileAccessMode.ReadWrite))
{
        // write the JSON string!
        using (DataWriter textWriter = new DataWriter(textStream))
        {
                textWriter.WriteString(jsonContents);
                await textWriter.StoreAsync();
        }
}
```

Reading data from stored file –

```
//Deserialize json from file "a.txt"
StorageFolder localFolder = ApplicationData.Current.LocalFolder;
        try
        {
            // Getting JSON from file if it exists, or file not found exception if it
            does not
            StorageFile textFile = await localFolder.GetFileAsync("a.txt");

            using (IRandomAccessStream textStream = await
            textFile.OpenReadAsync())
            {
                // Read text stream
                using (DataReader textReader = new
                DataReader(textStream))
             {
                //get size
                uint textLength = (uint)textStream.Size;
                await textReader.LoadAsync(textLength);
                // read it
                string jsonContents = textReader.ReadString(textLength);
                // deserialize back to our products
                obj =
            JsonConvert.DeserializeObject<shopsdata.restObj>(jsonContents);
             }
            }
         }
```

- Bing Maps Spatial Data Service – To store Data of shops and retrieve info about it.

  - Query By Property
  - Query By ID

CONCLUSION

Benefits:

Get details of all repair shops and gas stations:

- Near you (offline/online)
- Along your route (online)

Limitations:

- Offline functionality requires initial route setup
- Only prototype data used

REFERENCES

- www.microsoftvirtualacademy.com/
- https://www.bingmapsportal.com/
- https://code.msdn.microsoft.com/
- http://stackoverflow.com/questions/
- http://www.newtonsoft.com/json/help/html/Introduction.htm
- http://blogs.bing.com/maps/2012/11/05/getting-started-with-bing-maps-windows-store-apps-native/
- https://msdn.microsoft.com/en-us/library/ff701734.aspx
- http://blogs.msdn.com/b/wsdevsol/archive/2014/01/09/consuming-rest-services-in-your-windows-store-and-phone-applications.aspx
- http://blogs.msdn.com/b/wsdevsol/archive/2013/09/04/how-to-store-json-data-in-windows-phone-8.aspx