# Cook Book for Toolies

Toolies

GOV HACK COOKBOOK

**Gov Hack 2017**

# Table of Contents

# Chapter 1

## Objective

To showcase the ease in using own/open Data Sets (.csv,.xls) with Mobile Applications.

## Target Audience

High School IT students / individuals with entry level programming experience / interest to unleash Open Data Sets.

## In Short

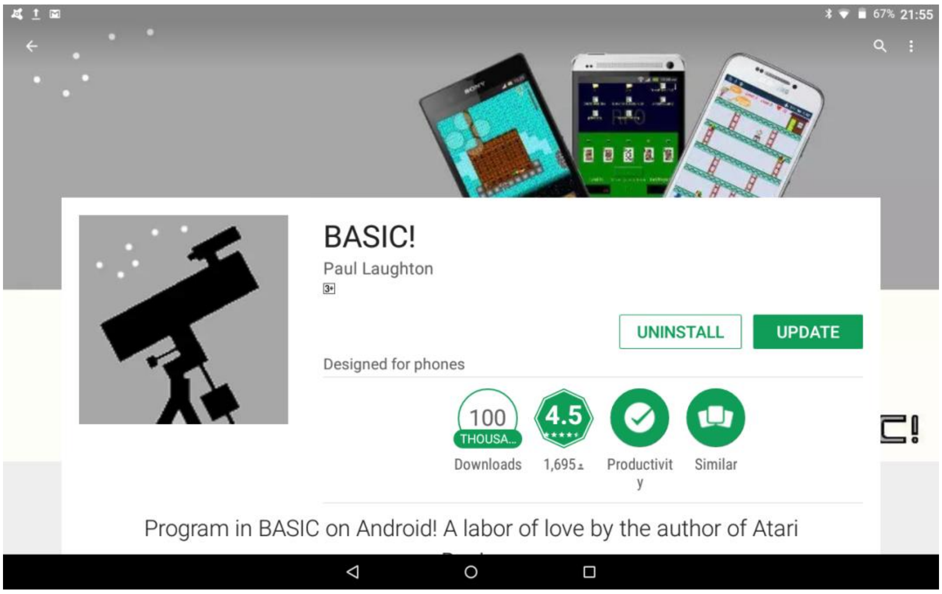
This Cook Book offers step by step instructions for successfully installing and running the sample application Toolies_Demo.bas which was developed on an Android tablet using RFO BASIC as part of the GovHack 2017 Competition.

# Chapter 2

## Pre-Requisite

1- An Android Phone or Tablet.

2- Download BASIC! (Paul Laughton) from Google Play (for free).

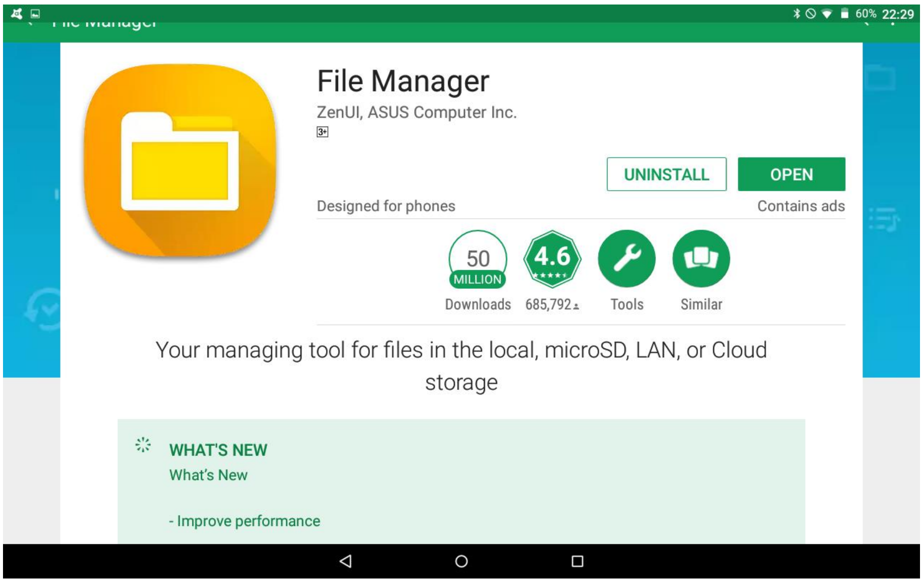


BASIC!

Paul Laughton

Program in BASIC on Android! A labor of love by the author of Atari

3- We recommend downloading File Manager (ZenUI, ASUS Comptuer Inc.) from Google Play (for free).



File Manager

ZenUI, ASUS Computer Inc.

3+

Designed for phones

Contains ads

50 MILLION Downloads

4.6 685,792

Your managing tool for files in the local, microSD, LAN, or Cloud storage

WHAT'S NEW

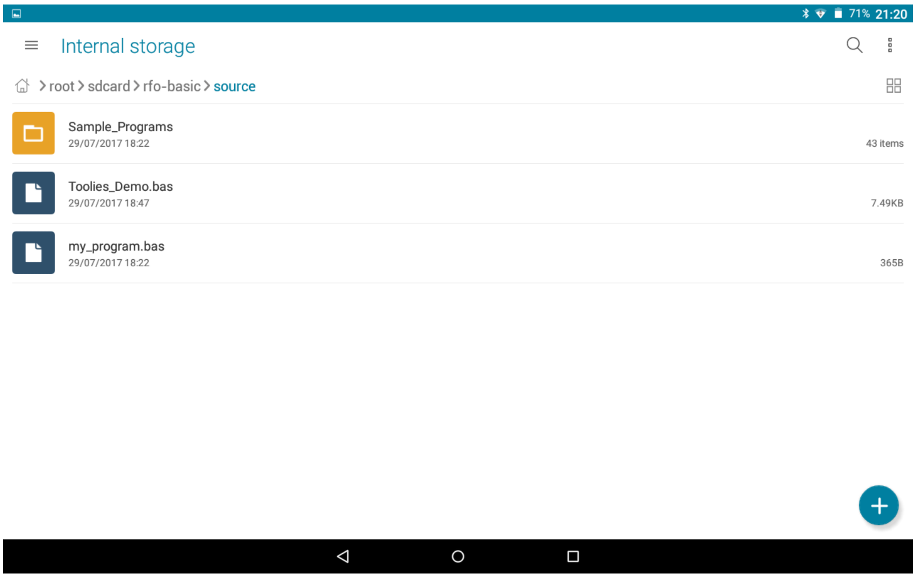
What's New

- Improve performance

4- Dowload the following files from **https://github.com/viru48/Toolies/** :

- **ACT_School_Locations.csv**
- **Toolies_Demo.bas**

5- Copy **Toolies_Demo.bas** to your Android device directory: rfo-basic/source



Internal storage

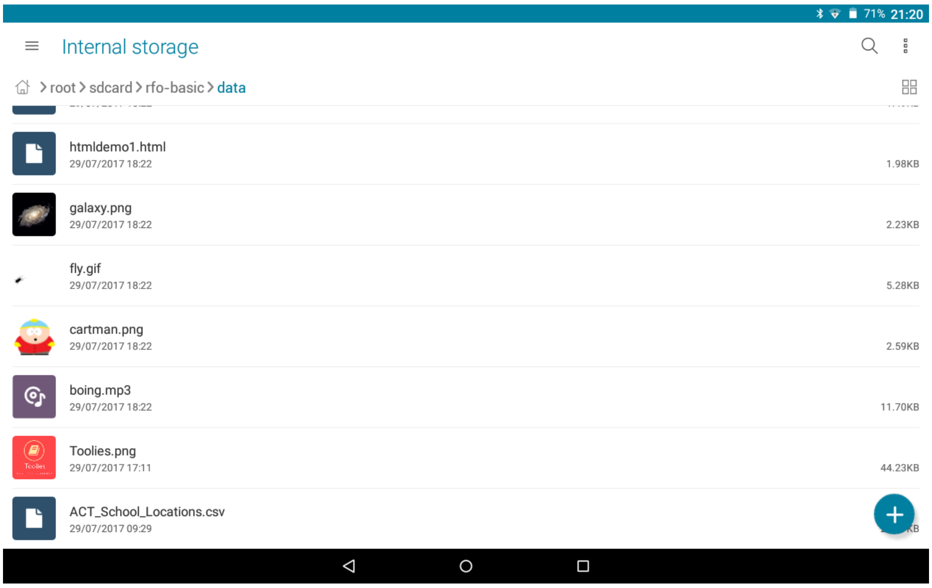
root > sdcard > rfo-basic > source

Sample_Programs 29/07/2017 18:22 43 items

Toolies_Demo.bas 29/07/2017 18:47 7.49KB

my_program.bas 29/07/2017 18:22 365B

6- Copy **ACT_School_Locations.csv** to your Android device directory: rfo-basic/data



Internal storage

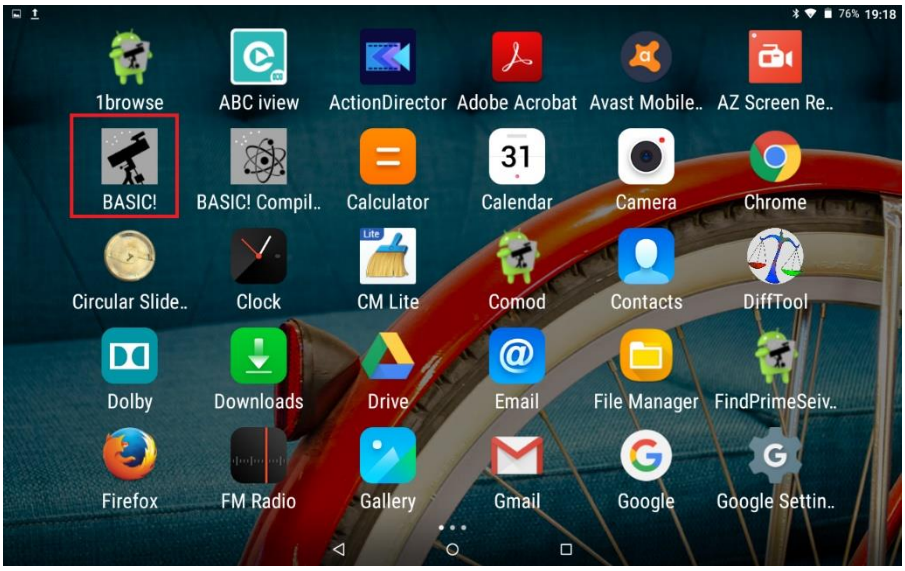
root > sdcard > rfo-basic > data

| | | |
|---|---|---|
| htmldemo1.html | 29/07/2017 18:22 | 1.98KB |
| galaxy.png | 29/07/2017 18:22 | 2.23KB |
| fly.gif | 29/07/2017 18:22 | 5.28KB |
| cartman.png | 29/07/2017 18:22 | 2.59KB |
| boing.mp3 | 29/07/2017 18:22 | 11.70KB |
| Toolies.png | 29/07/2017 17:11 | 44.23KB |
| ACT_School_Locations.csv | 29/07/2017 09:29 | |

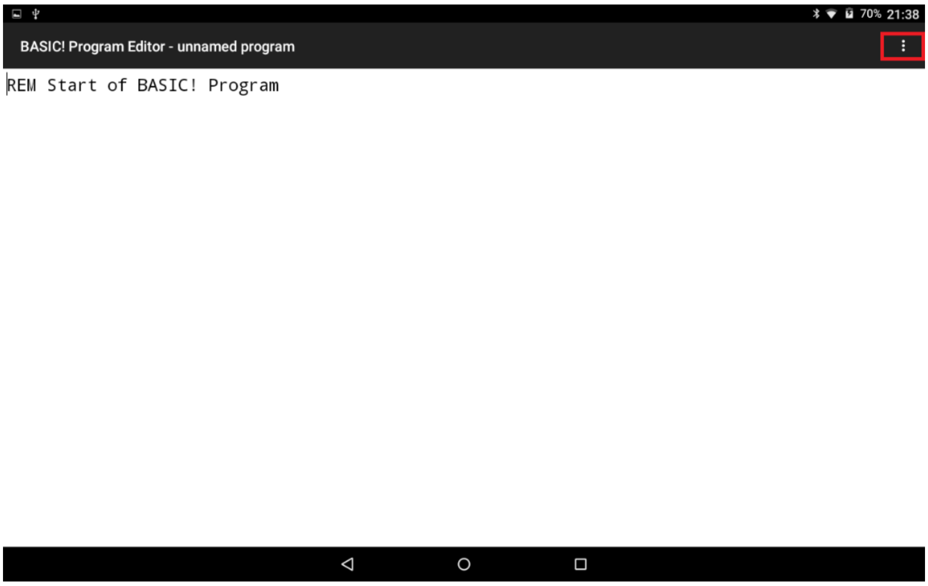
# Chapter 3

## Toolies Demo In Action

1- Open RFO BASIC

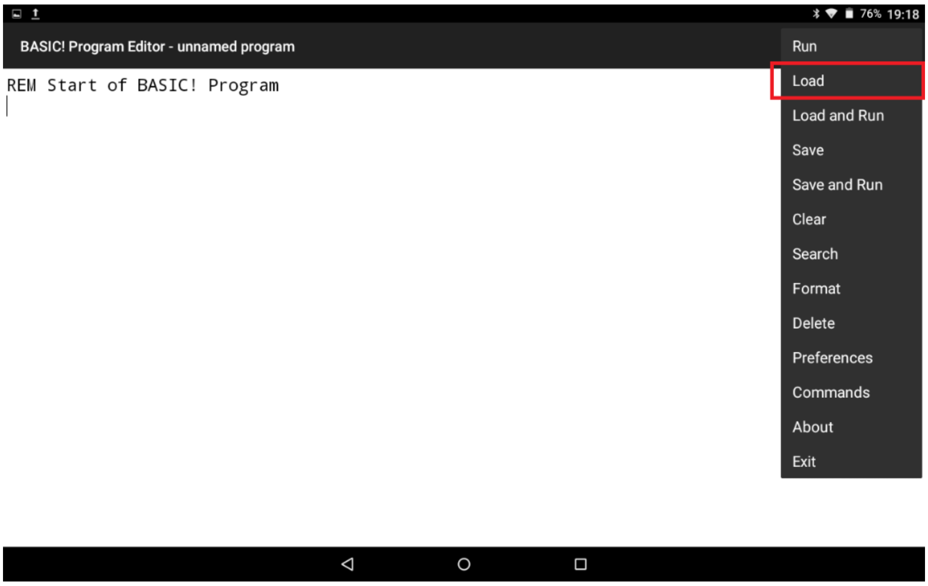


2- Click on Menu



```
REM Start of BASIC! Program
```

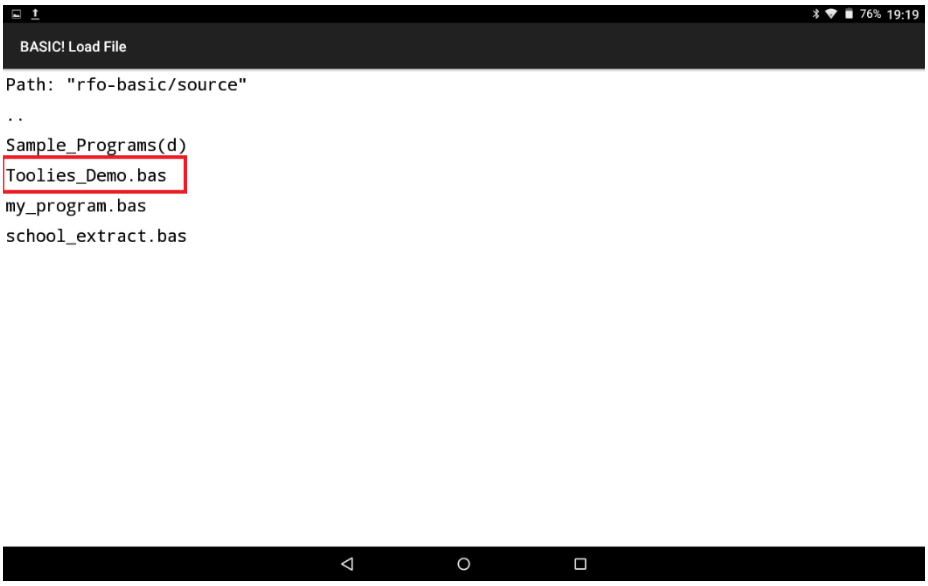
3- Click on Load



BASIC! Program Editor - unnamed program

```
REM Start of BASIC! Program
```

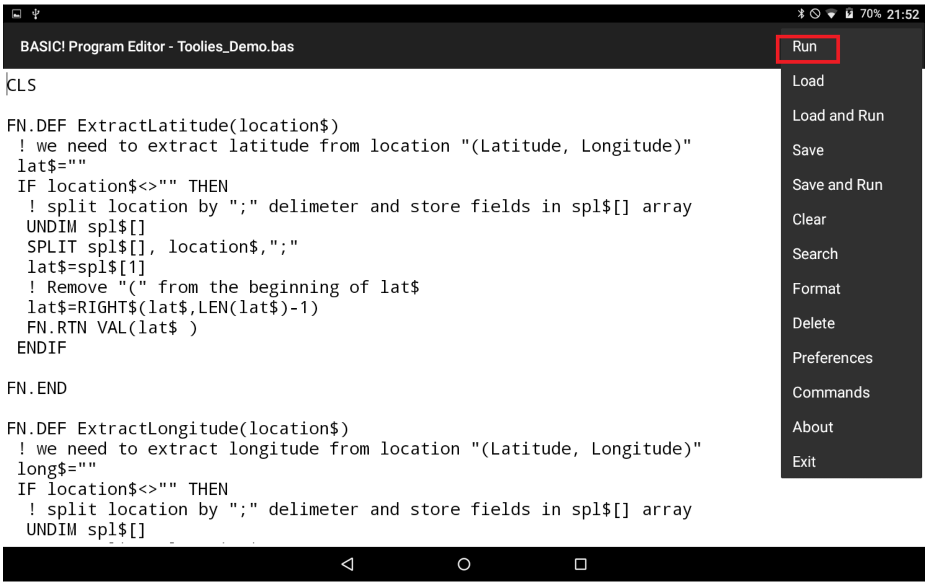
4- Select Toolies_Demo.bas



BASIC! Load File

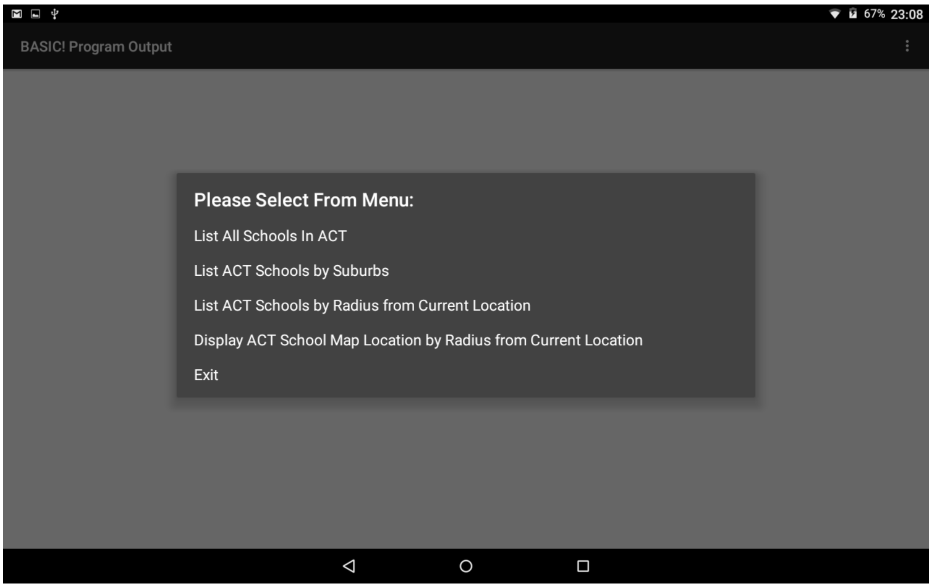
```
Path: "rfo-basic/source"
..
Sample_Programs(d)
Toolies_Demo.bas
my_program.bas
school_extract.bas
```

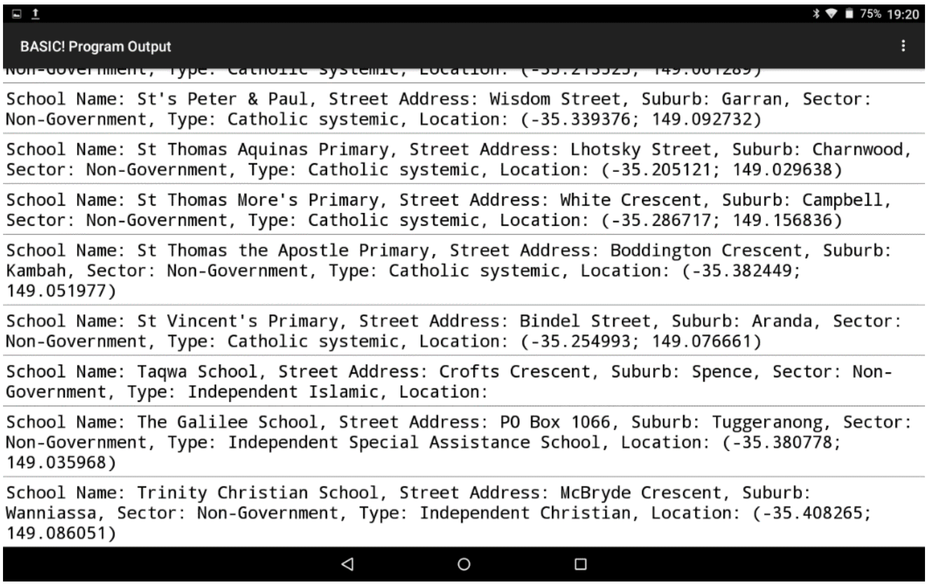
5- Select Run



```
CLS

FN.DEF ExtractLatitude(location$)
 ! we need to extract latitude from location "(Latitude, Longitude)"
 lat$=""
 IF location$<>"" THEN
  ! split location by ";" delimeter and store fields in spl$[] array
  UNDIM spl$[]
  SPLIT spl$[], location$,";"
  lat$=spl$[1]
  ! Remove "(" from the beginning of lat$
  lat$=RIGHT$(lat$,LEN(lat$)-1)
  FN.RTN VAL(lat$ )
 ENDIF

FN.END

FN.DEF ExtractLongitude(location$)
 ! we need to extract longitude from location "(Latitude, Longitude)"
 long$=""
 IF location$<>"" THEN
  ! split location by ";" delimeter and store fields in spl$[] array
  UNDIM spl$[]
```

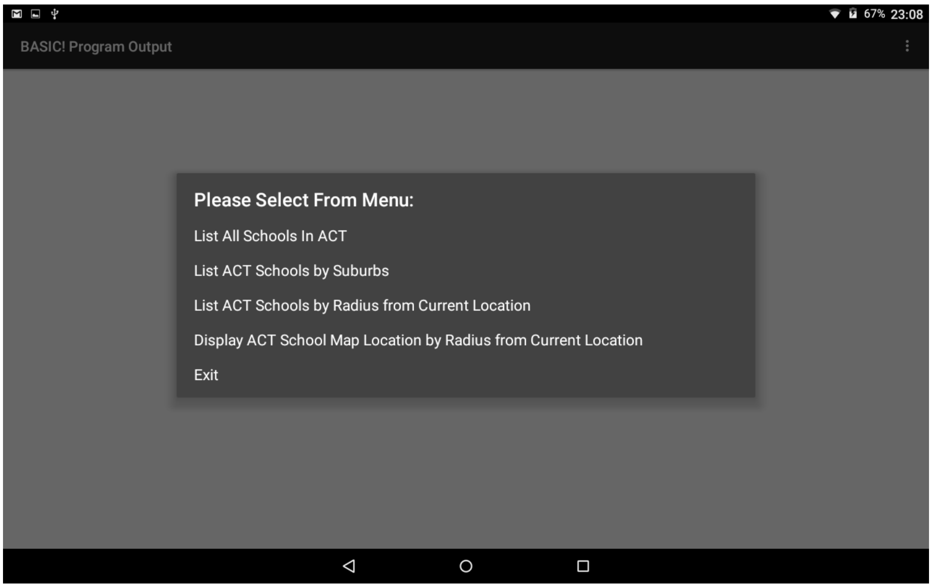
6- By Selecting List All Schools in ACT: program displays all ACT schools with their details. (Note by clicking the Back Key, program returns to Main Menu).


67% 23:08
BASIC! Program Output
Please Select From Menu:
List All Schools In ACT
List ACT Schools by Suburbs
List ACT Schools by Radius from Current Location
Display ACT School Map Location by Radius from Current Location
Exit

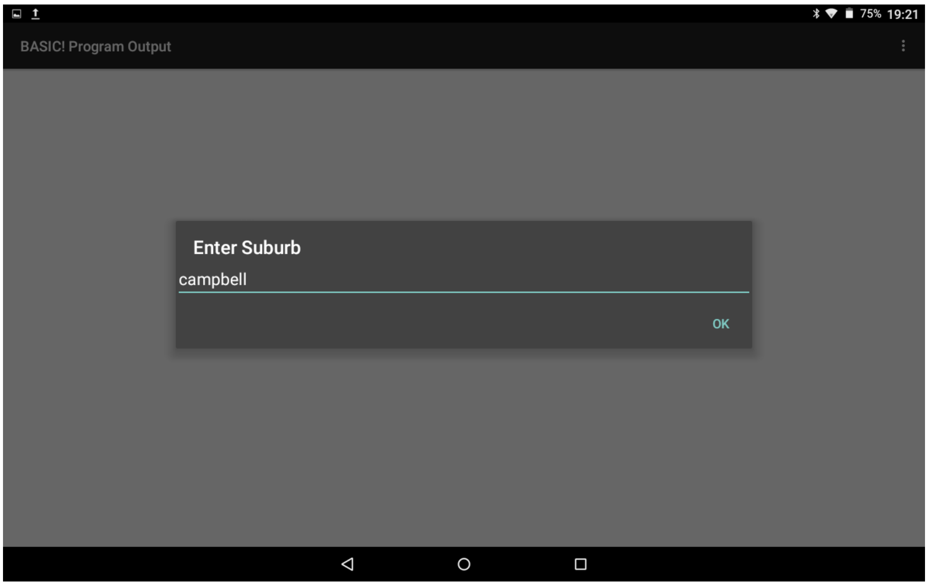


```
Non-Government, Type: Catholic systemic, Location: (-35.213525; 149.061289)
School Name: St's Peter & Paul, Street Address: Wisdom Street, Suburb: Garran, Sector:
Non-Government, Type: Catholic systemic, Location: (-35.339376; 149.092732)
School Name: St Thomas Aquinas Primary, Street Address: Lhotsky Street, Suburb: Charnwood,
Sector: Non-Government, Type: Catholic systemic, Location: (-35.205121; 149.029638)
School Name: St Thomas More's Primary, Street Address: White Crescent, Suburb: Campbell,
Sector: Non-Government, Type: Catholic systemic, Location: (-35.286717; 149.156836)
School Name: St Thomas the Apostle Primary, Street Address: Boddington Crescent, Suburb:
Kambah, Sector: Non-Government, Type: Catholic systemic, Location: (-35.382449;
149.051977)
School Name: St Vincent's Primary, Street Address: Bindel Street, Suburb: Aranda, Sector:
Non-Government, Type: Catholic systemic, Location: (-35.254993; 149.076661)
School Name: Taqwa School, Street Address: Crofts Crescent, Suburb: Spence, Sector: Non-
Government, Type: Independent Islamic, Location:
School Name: The Galilee School, Street Address: PO Box 1066, Suburb: Tuggeranong, Sector:
Non-Government, Type: Independent Special Assistance School, Location: (-35.380778;
149.035968)
School Name: Trinity Christian School, Street Address: McBryde Crescent, Suburb:
Wanniassa, Sector: Non-Government, Type: Independent Christian, Location: (-35.408265;
149.086051)
```

7- By Selecting List ACT Schools by Suburbs: program will prompt for a Suburb then displays all schools in Suburb (if any). (Note by clicking the Back Key, program returns to Main Menu).



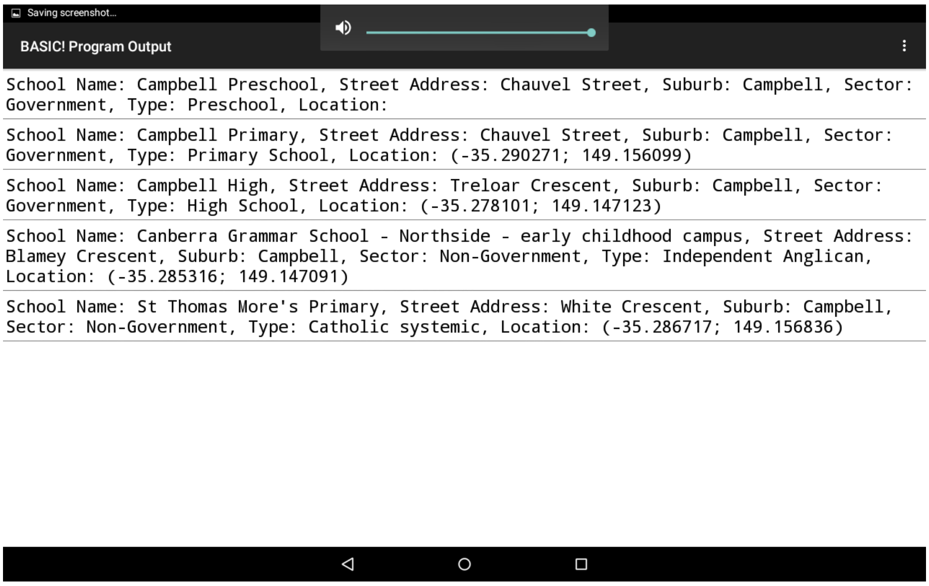
67% 23:08
BASIC! Program Output
Please Select From Menu:
List All Schools In ACT
List ACT Schools by Suburbs
List ACT Schools by Radius from Current Location
Display ACT School Map Location by Radius from Current Location
Exit



Enter Suburb

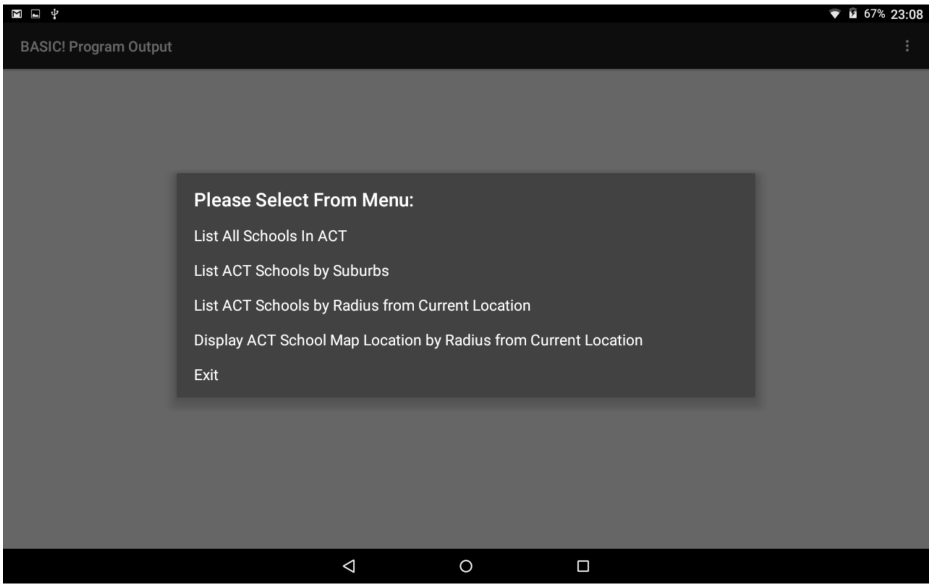
campbell

OK



```
School Name: Campbell Preschool, Street Address: Chauvel Street, Suburb: Campbell, Sector:
Government, Type: Preschool, Location:
School Name: Campbell Primary, Street Address: Chauvel Street, Suburb: Campbell, Sector:
Government, Type: Primary School, Location: (-35.290271; 149.156099)
School Name: Campbell High, Street Address: Treloar Crescent, Suburb: Campbell, Sector:
Government, Type: High School, Location: (-35.278101; 149.147123)
School Name: Canberra Grammar School - Northside - early childhood campus, Street Address:
Blamey Crescent, Suburb: Campbell, Sector: Non-Government, Type: Independent Anglican,
Location: (-35.285316; 149.147091)
School Name: St Thomas More's Primary, Street Address: White Crescent, Suburb: Campbell,
Sector: Non-Government, Type: Catholic systemic, Location: (-35.286717; 149.156836)
```

8- By Selecting List ACT Schools by Radius from Current Location: program will prompt for a Radius in Kms and then lists all schools in Area (Note, if Device GPS Location is not On, the program defaults to a Canberra Location).



Please Select From Menu:

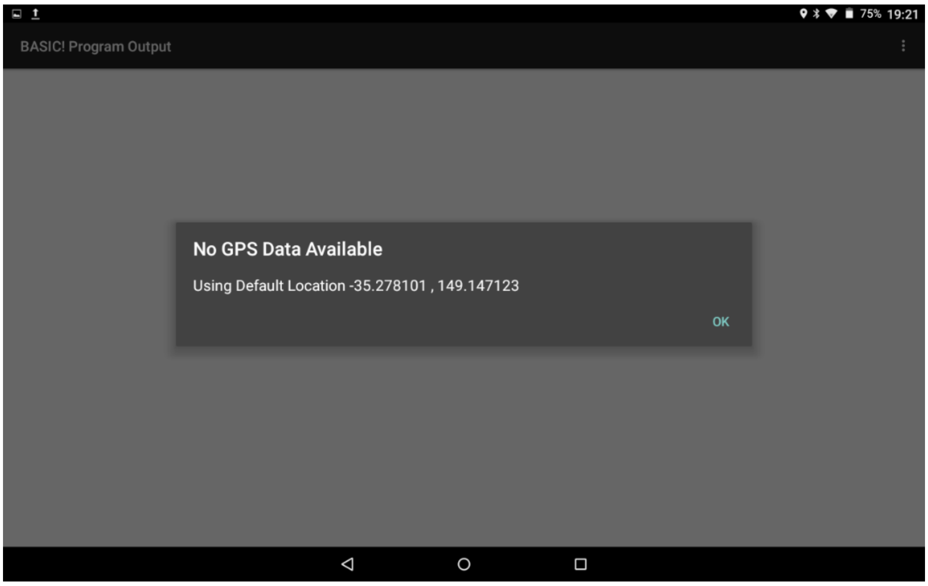
List All Schools In ACT

List ACT Schools by Suburbs

List ACT Schools by Radius from Current Location

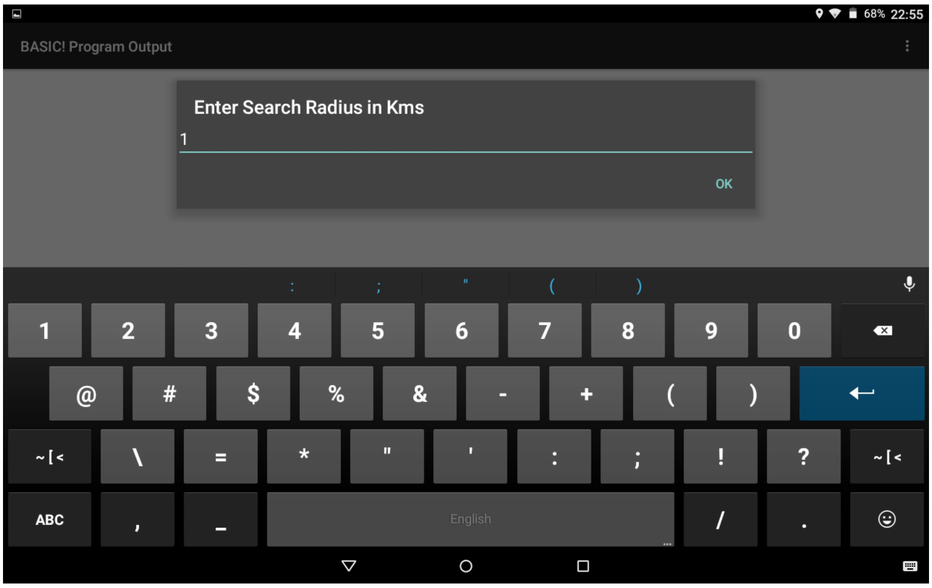
Display ACT School Map Location by Radius from Current Location

Exit



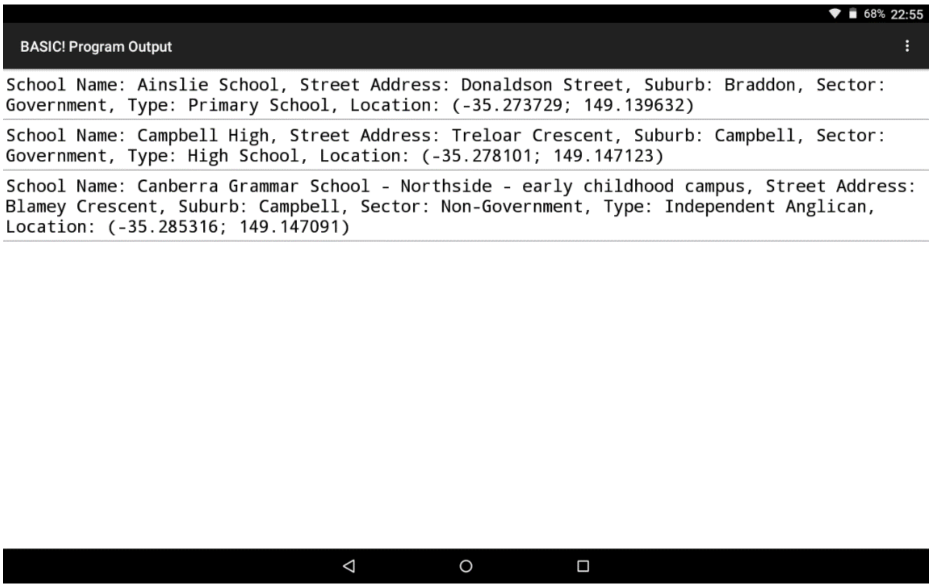
No GPS Data Available

Using Default Location -35.278101 , 149.147123



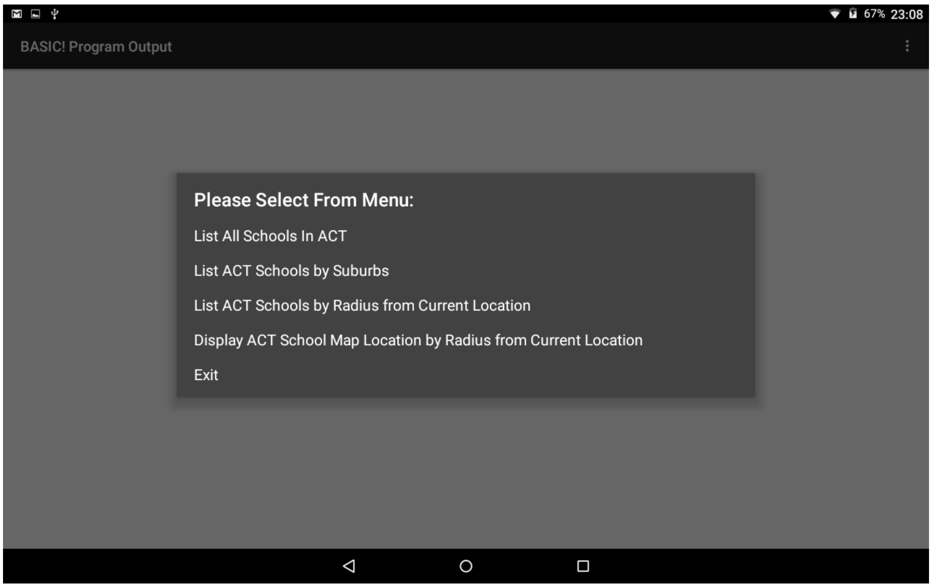
Enter Search Radius in Kms

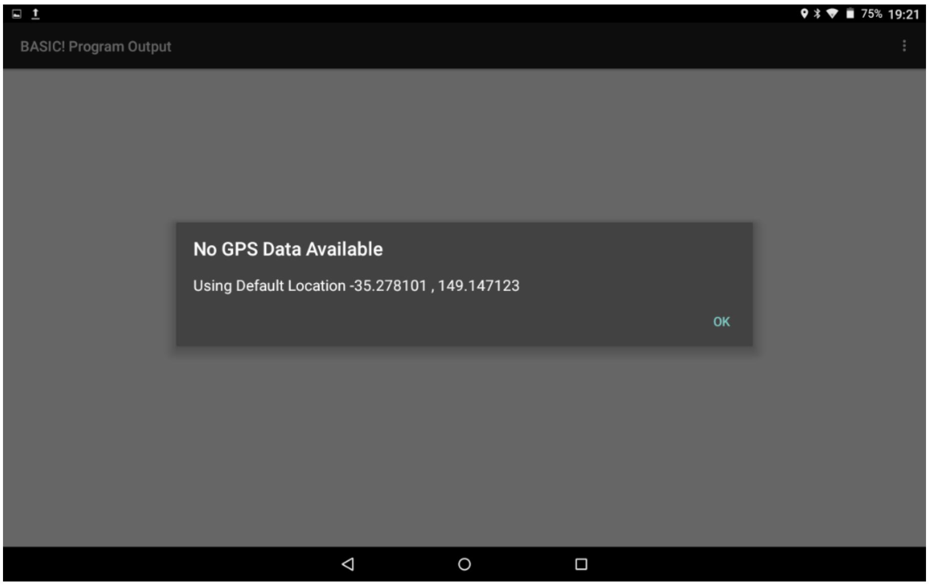
1



```
School Name: Ainslie School, Street Address: Donaldson Street, Suburb: Braddon, Sector:
Government, Type: Primary School, Location: (-35.273729; 149.139632)
School Name: Campbell High, Street Address: Treloar Crescent, Suburb: Campbell, Sector:
Government, Type: High School, Location: (-35.278101; 149.147123)
School Name: Canberra Grammar School - Northside - early childhood campus, Street Address:
Blamey Crescent, Suburb: Campbell, Sector: Non-Government, Type: Independent Anglican,
Location: (-35.285316; 149.147091)
```

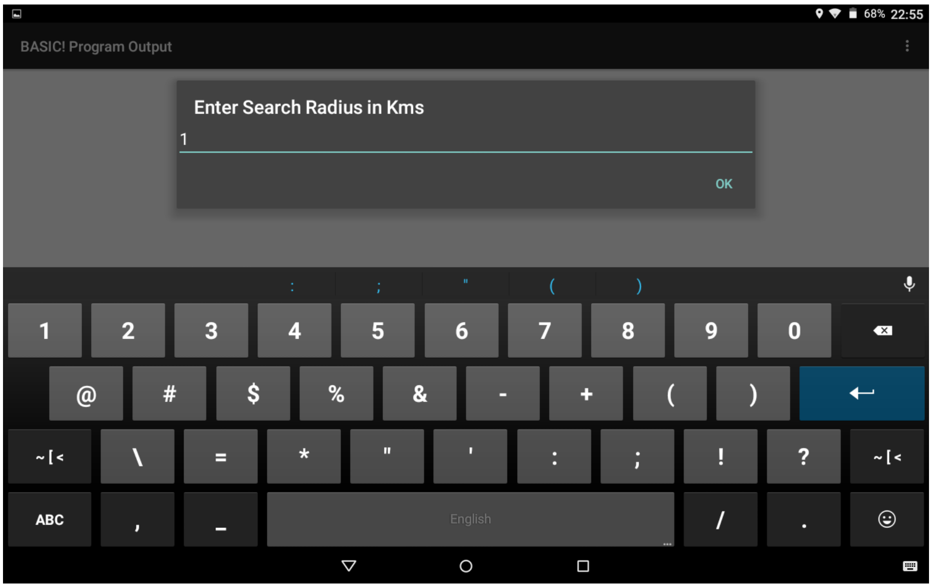
9- By Selecting Display ACT School Map Location from Current Location: program will prompt for a Radius in Kms and then lists all schools in Area (Note, if Device GPS Location is not On, the program defaults to a Canberra Location). Once a school is selected, Google Maps will display with the school location.


67% 23:08
BASIC! Program Output
Please Select From Menu:
List All Schools In ACT
List ACT Schools by Suburbs
List ACT Schools by Radius from Current Location
Display ACT School Map Location by Radius from Current Location
Exit



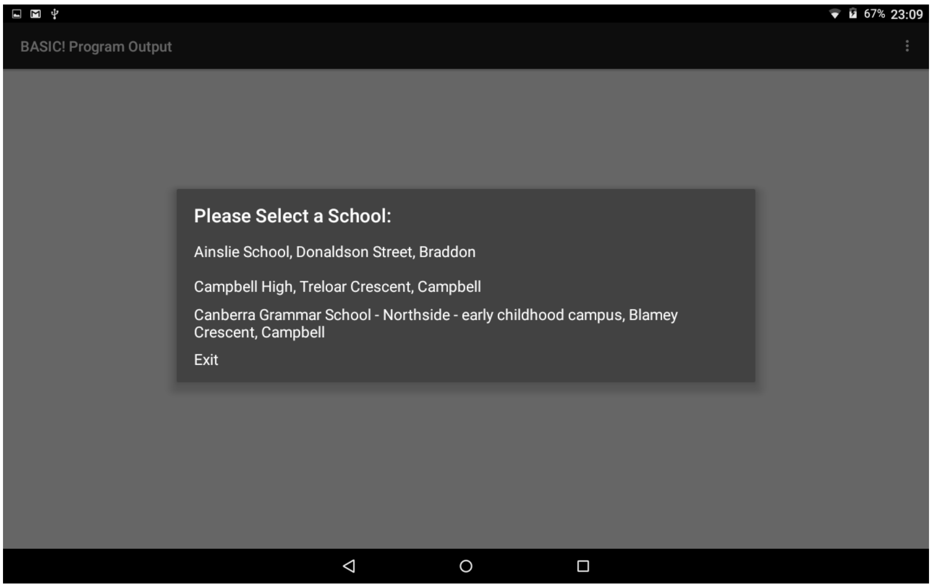
No GPS Data Available

Using Default Location -35.278101 , 149.147123



Enter Search Radius in Kms

1



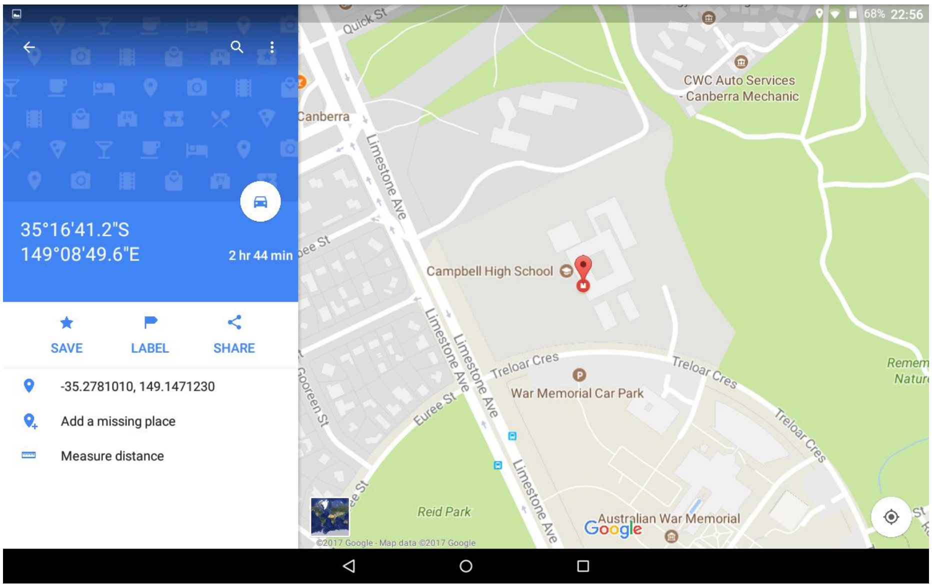
Please Select a School:

Ainslie School, Donaldson Street, Braddon

Campbell High, Treloar Crescent, Campbell

Canberra Grammar School - Northside - early childhood campus, Blamey Crescent, Campbell

Exit



35°16'41.2"S
149°08'49.6"E

2 hr 44 min

-35.2781010, 149.1471230

# Chapter 4

## Toolies Demo Source Code

```
CLS
FN.DEF ExtractLatitude(location$)
 ! we need to extract latitude from location "(Latitude, Longitude)"
 lat$=""
 IF location$<>"" THEN
  ! split location by ";" delimeter and store fields in spl$[] array
  UNDIM spl$[]
  SPLIT spl$[], location$,";"
  lat$=spl$[1]
  ! Remove "(" from the beginning of lat$
  lat$=RIGHT$(lat$,LEN(lat$)-1)
  FN.RTN VAL(lat$ )
 ENDIF

FN.END
```

```
FN.DEF ExtractLongitude(location$)
 ! we need to extract longitude from location "(Latitude, Longitude)"
 long$=""
 IF location$<>"" THEN
  ! split location by ";" delimeter and store fields in spl$[] array
  UNDIM spl$[]
  SPLIT spl$[], location$,";"
  long$=spl$[2]
  ! Remove ")" from the end of long$
  long$=LEFT$(long$,LEN(long$)-1)
  FN.RTN VAL(long$)
 ENDIF

FN.END
```

```
FN.DEF degreesToRadians(degrees)
 FN.RTN degrees * PI() / 180
FN.END
```

```
FN.DEF GpsDistance(lat1, lon1, lat2, lon2)
 earthRadiusKm = 6371

 dLat = degreesToRadians(lat2-lat1)
 dLon = degreesToRadians(lon2-lon1)

 lat1 = degreesToRadians(lat1)
 lat2 = degreesToRadians(lat2)

 a = SIN(dLat/2) * SIN(dLat/2) + SIN(dLon/2) * SIN(dLon/2) * COS(lat1) *
COS(lat2)
 c = 2 * ATAN2(SQR(a), SQR(1-a))
 FN.RTN earthRadiusKm * c

FN.END
```

```
v_error_back=0

! Create and load rec$[]
GOSUB GET_DATA

START:

CLS
! Setup your Menu
ARRAY.LOAD menus$[] ~
"List All Schools In ACT"~
"List ACT Schools by Suburbs"~
"List ACT Schools by Radius from Current Location"~
"Display ACT School Map Location by Radius from Current Location"~
"Exit"


! Set the Popup Message
msg$ ="Please Select From Menu: "

! Shows the list and waits for the user
! to make the selection.
DIALOG.SELECT menu, menus$[], msg$

SW.BEGIN menu

 SW.CASE 1
  GOSUB LIST_ALL
  SW.BREAK

 SW.CASE 2
  GOSUB LIST_SUBURBS
  SW.BREAK

 SW.CASE 3
  GOSUB LIST_RADIUS
  SW.BREAK

 SW.CASE 4
  GOSUB SCHOOL_MAP_RADIUS
  SW.BREAK

 SW.CASE 5
  EXIT

 SW.DEFAULT
  GOTO start

SW.END


GOTO start


END
```

```
GET_DATA:

! open file

fl$="ACT_School_Locations.csv"

TEXT.OPEN R, FN1, fl$

! first line which is the header line
TEXT.READLN FN1, a_line$

! find out how may fields in the header
! store value in fld_num

UNDIM spl$[]
SPLIT spl$[], a_line$,","
ARRAY.LENGTH fld_num, spl$[]


! let us find out how many records we have in the file
! store value in rec_num

rec_num=0
TEXT.READLN FN1, a_line$
WHILE a_line$ <> "EOF"
 rec_num = rec_num +1
 TEXT.READLN FN1, a_line$
REPEAT

! close file
TEXT.CLOSE FN1


!!

create array rec$[] to capture the following data
Field 1: School Name
Field 2: Street Address
Field 3: Suburb
Field 4: Sector
Field 5: Type
Field 6: Location

!!

DIM rec$[rec_num,fld_num]

! open file
TEXT.OPEN R, FN1, fl$

! skip first line which is title line
TEXT.READLN FN1, a_line$

FOR I = 1 TO rec_num
 TEXT.READLN FN1, a_line$

 ! clear array spl$[]
 UNDIM spl$[]
 ! split each record line by comma delimeter and store fields in spl$[] array
 ! eg school_code will be stored in spl$[1],  school_name will be stored in
spl$[3]


 SPLIT spl$[], a_line$,","
 ! If the last column is blank, we will be short on a column
 ! The next command will return the number of columns

 ARRAY.LENGTH flds ,spl$[]

 ! load each record in rec$[I,j]
 ! rec$[1,1] will store the School Name for the first record
 ! rec$[1,2] will store the Street Address for the first record
 ! rec$[1,3] will store the Suburb for the first record
 ! rec$[1,4] will store the Sector for the first record
```

```
LIST_ALL:

FOR i = 1 TO rec_num
 PRINT "School Name: "; rec$[i,1];", "; "Street Address: "; rec$[i,2];",
";"Suburb: "; rec$[i,3];", ";"Sector: "; rec$[i,4];", ";"Type: "; rec$[i,5];",
";"Location: "; rec$[i,6]
NEXT i


IF v_error_back =1 THEN BACK.RESUME

GOTO WaitLoop

RETURN

LIST_SUBURBS:

INPUT "Enter Suburb",PSUBURB$

FOR i = 1 TO rec_num
 IF UPPER$(rec$[i,3])=UPPER$(PSUBURB$) THEN
  PRINT "School Name: "; rec$[i,1];", "; "Street Address: "; rec$[i,2];",
";"Suburb: "; rec$[i,3];", ";"Sector: "; rec$[i,4];", ";"Type: "; rec$[i,5];",
";"Location: "; rec$[i,6]
 ENDIF
NEXT i

IF v_error_back =1 THEN BACK.RESUME

GOTO WaitLoop


RETURN
```

```
LIST_RADIUS:

GPS.OPEN

GPS.LATITUDE latitude
! PRINT  "Latitude:   " + FORMAT$("##%.#####", latitude)

GPS.LONGITUDE longitude
! PRINT"Longitude:  " + FORMAT$("##%.#####", longitude)


IF ABS(Latitude) = 0  | ABS(longitude) =0 THEN

 latitude= -35.278101
 longitude=149.147123
!!
 latitude= -33.81571            %-33.780193
 longitude=151.00050           %150.905175
!!
 DIALOG.MESSAGE "No GPS Data Available", "Using Default Location -35.278101 ,
149.147123 ",go,"ok"

ENDIF


Enter_Radius1:
INPUT "Enter Search Radius in Kms",KMS$
IF !IS_NUMBER(KMS$) THEN GOTO Enter_Radius1
km=VAL(kms$)

v_CNT=0

FOR i = 1 TO rec_num
 ! we need to extract latitude and longitude from rec$[i,6]
 IF rec$[i,6]<>"" THEN
  position$=rec$[i,6]

  lat = ExtractLatitude(position$)
  long =  ExtractLongitude(position$)

  IF ABS(GpsDistance(latitude, longitude, lat,long) ) <= km THEN
   PRINT "School Name: "; rec$[i,1];", "; "Street Address: "; rec$[i,2];",
";"Suburb: "; rec$[i,3];", ";"Sector: "; rec$[i,4];", ";"Type: "; rec$[i,5];",
";"Location: "; rec$[i,6]
   v_CNT=v_CNT+1
  ENDIF
 ENDIF


NEXT i



GPS.CLOSE




IF v_cnt =0 THEN
 DIALOG.MESSAGE "No Schools In This Area", " ",go,"ok"
 IF v_error_back =1 THEN BACK.RESUME
ELSE
 IF v_error_back =1 THEN BACK.RESUME
 GOTO WaitLoop
ENDIF

SCHOOL_MAP_RADIUS:
GPS.OPEN

GPS.LATITUDE latitude
! PRINT  "Latitude:   " + FORMAT$("##%.#####", latitude)

GPS.LONGITUDE Longitude
! PRINT"Longitude:  " + FORMAT$("##%.#####", longitude)
```

```
WaitLoop:

w=0
DO
 PAUSE 10
UNTIL w=1
```

```
ONBACKKEY:
v_error_back =1
RETURN
```