

Saturday, February 10, 2018

Link to my blog entry: <https://edspi31415.blogspot.com/2018/02/hp-prime-custom-app-geomcalc.html>

Text follows below - Eddie

HP Prime Custom App: GeomCalc

HP Prime Custom App: GeomCalc

Introduction

The app GeomCalc is an example of a custom HP App for the HP Prime. For general information, please visit this blog entry: <http://edspi31415.blogspot.com/2018/02/hp-prime-intro-to-blank-custom-apps.html>

Let's get start with this example app.

START - The Initial Conditions

Here I set the app's angle to degrees mode. Note that I use the variable AAngle instead of the global variable HAngle. The values for AAngle are slightly different than HAngle:

- 0: use the angle setting from Home Settings
- 1: Radians
- 2: Degrees
- 3: Gradians

I want the app to operate with angles in degrees, so I set AAngle to 1.

The last command is a message box containing the word Ready, to let the user know that the app is all set to go.

```
START()  
BEGIN  
// Set app angle to degrees  
AAngle:=2;  
MSGBOX("Ready.");  
END;
```

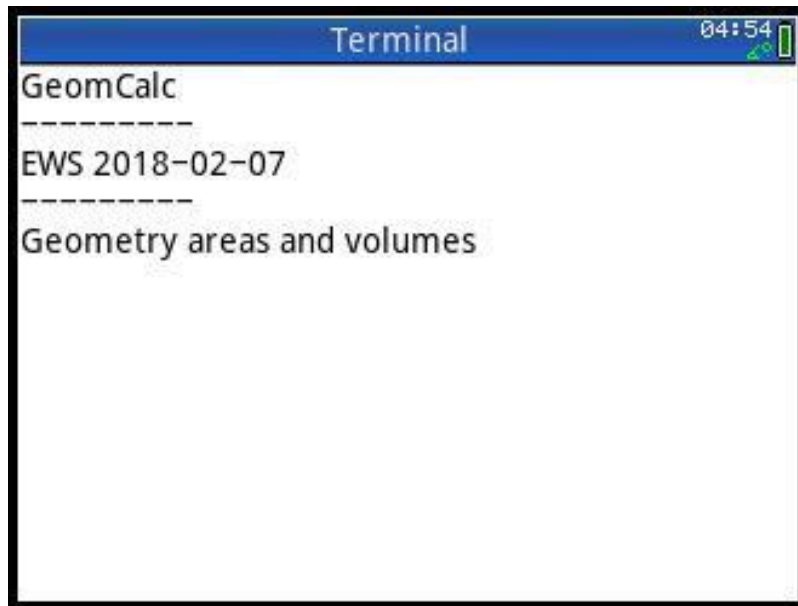
Info – Title and Introduction

I want to leave some basic information about this app. I recommend that you use the PRINT command rather than the TEXTOUT/WAIT/FREEZE. Alternatively, you can store a string in ANote.

I prefer using PRINT because I can print multiple lines with appropriate line breaks.

```
Info()  
BEGIN  
PRINT();  
PRINT("GeomCalc");  
PRINT("-----");  
PRINT("EWS 2018-02-07");
```

```
PRINT("-----");
PRINT("Geometry areas and volumes");
END;
```



The Symb section – selecting the calculation

In this section, I set the variable *I* to a choice of one of ten options. The variable *I* is a global variable, so I can use determine calculations. The INPUT command uses a dropdown box. The general format for a single dropdown box is:

```
INPUT( { { var, {"choice 1", "choice 2", ... }}, ... (other parameters) )
```

The message box at the end let's the user know that the choice has been set, and can now proceed to the calculation by pressing [Num].

```
Symb()
BEGIN
// Choose the calculation
// Global vars are used
INPUT({{I,{"Area: Circle",
"Area: Ellipse",
"Area: Trapezoid",
"Area: Circular Sector",
"Area: Regular Polygon",
"Volume: Sphere",
"Volume: Cylinder",
"Volume: Cone",
"Volume: Box",
"Volume: Ellipsoid"}}},
"Select Your Calculation");
MSGBOX("It's set!");
END;
```



The Num section – doing the calculation

When the [Num] is pressed, the user is asked to enter the arguments. The final result is displayed on the terminal. Since global variables (including A-Z) are used, values are permanently stored until changed. In this app, I store the area in the variable *E* and the volume in *V*.

There is no default selection, so I use ten IF-THEN structures than a CASE structure.

```
Num()
BEGIN

IF I==1 THEN
INPUT(R,"Area: Circle","Radius: ");
E:= $\pi$ *R^2;
PRINT();
```

```
PRINT("Area: "+E);
END;
```

```
IF I==2 THEN
INPUT({A,B},"Area: Ellipse",
{"A: ", "B: "});
E:= $\pi$ *A*B;
PRINT();
PRINT("Area: "+E);
END;
```

```
IF I==3 THEN
INPUT({A,B,H},"Area: Trapezoid",
{"A: ", "B: ", "H: "});
E:=0.5*H*(A+B);
PRINT();
PRINT("Area: "+E);
END;
```

```
IF I==4 THEN
INPUT({ $\theta$ ,R},"Area: Circular
Sector",{"Angle (°): ",
"Radius: "});
E:= $\theta$ * $\pi$ *R^2/360;
PRINT();
PRINT("Area: "+E);
END;
```

```
IF I==5 THEN
INPUT({N,S},"Area: Regular
Polygon",{"# sides: ",
"Length: "});
E:=N*S^2/(4*TAN(180/N));
PRINT();
PRINT("Area: "+E);
END;
```

```
IF I==6 THEN
INPUT(R,"Volume: Sphere","Radius: ");
V:=4/3* $\pi$ *R^3;
PRINT();
PRINT("Volume: "+V);
END;
```

```
IF I==7 THEN
INPUT({R,H},"Volume: Cylinder",
{"Radius: ", "Height: "});
V:= $\pi$ *R^2*H;
PRINT();
PRINT("Volume: "+V);
END;
```

```
IF I==8 THEN
INPUT({R,H},"Volume: Cone",
{"Radius: ", "Height: "});
V:= $\pi$ *R^2*H/3;
PRINT();
```

```
PRINT("Volume: "+V);
END;

IF I==9 THEN
INPUT({A,B,C},"Volume: Box",
{"A: ","B: ","C: "});
V:=A*B*C;
PRINT();
PRINT("Volume: "+V);
END;

IF I==10 THEN
INPUT({A,B,C},"Volume: Ellipsoid",
{"A: ","B: ","C: "});
V:=4/3*π*A*B*C;
PRINT();
PRINT("Volume: "+V);
END;

END;
```

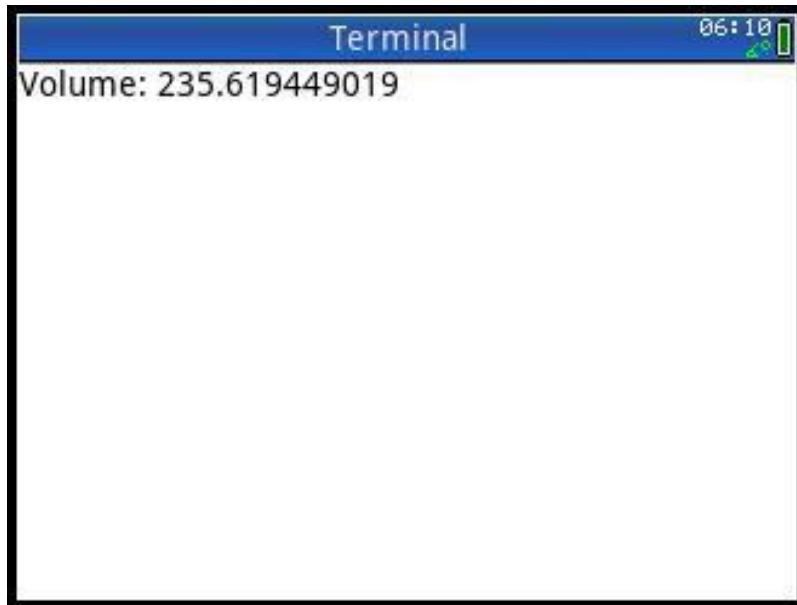
Volume: Cylinder 06:09

Radius: 5

Height: 3

Enter value for Radius:

Edit [] [] [] Cancel OK



Putting It All Together

```
#pragma mode( separator(.,;) integer(h32) )
```

```
Symb()  
BEGIN  
  // Choose the calculation  
  // Global vars are used  
  INPUT({I,{"Area: Circle",  
    "Area: Ellipse",  
    "Area: Trapezoid",  
    "Area: Circular Sector",  
    "Area: Regular Polygon",  
    "Volume: Sphere",  
    "Volume: Cylinder",  
    "Volume: Cone",  
    "Volume: Box",  
    "Volume: Ellipsoid"}}},  
    "Select Your Calculation");  
  MSGBOX("It's set!");  
END;
```

```
//Plot()  
//BEGIN  
// MSGBOX("Plot");  
//END;
```

```
Num()  
BEGIN  
  
  IF I==1 THEN  
    INPUT(R,"Area: Circle","Radius: ");  
    E:= $\pi$ *R^2;
```

```

PRINT();
PRINT("Area: "+E);
END;

IF I==2 THEN
INPUT({A,B},"Area: Ellipse",
{"A: ", "B: "});
E:= $\pi$ *A*B;
PRINT();
PRINT("Area: "+E);
END;

IF I==3 THEN
INPUT({A,B,H},"Area: Trapezoid",
{"A: ", "B: ", "H: "});
E:=0.5*H*(A+B);
PRINT();
PRINT("Area: "+E);
END;

IF I==4 THEN
INPUT({ $\theta$ ,R},"Area: Circular
Sector",{"Angle (°): ",
"Radius: "});
E:= $\theta$ * $\pi$ *R^2/360;
PRINT();
PRINT("Area: "+E);
END;

IF I==5 THEN
INPUT({N,S},"Area: Regular
Polygon",{"# sides: ",
"Length: "});
E:= $N*S^2/(4*\text{TAN}(180/N))$ ;
PRINT();
PRINT("Area: "+E);
END;

IF I==6 THEN
INPUT(R,"Volume: Sphere","Radius: ");
V:= $4/3*\pi*R^3$ ;
PRINT();
PRINT("Volume: "+V);
END;

IF I==7 THEN
INPUT({R,H},"Volume: Cylinder",
{"Radius: ", "Height: "});
V:= $\pi*R^2*H$ ;
PRINT();
PRINT("Volume: "+V);
END;

IF I==8 THEN
INPUT({R,H},"Volume: Cone",
{"Radius: ", "Height: "});
V:= $\pi*R^2*H/3$ ;

```

```

PRINT();
PRINT("Volume: "+V);
END;

IF I==9 THEN
INPUT({A,B,C},"Volume: Box",
{"A: ","B: ","C: "});
V:=A*B*C;
PRINT();
PRINT("Volume: "+V);
END;

IF I==10 THEN
INPUT({A,B,C},"Volume: Ellipsoid",
{"A: ","B: ","C: "});
V:=4/3* $\pi$ *A*B*C;
PRINT();
PRINT("Volume: "+V);
END;

END;

//SymbSetup()
//BEGIN
// MSGBOX("SymbSetup");
//END;

//PlotSetup()
//BEGIN
// MSGBOX("PlotSetup");
//END;

//NumSetup()
//BEGIN
// MSGBOX("NumSetup");
//END;

Info()
BEGIN
PRINT();
PRINT("GeomCalc");
PRINT("-----");
PRINT("EWS 2018-02-07");
PRINT("-----");
PRINT("Geometry areas and volumes");
END;

START()
BEGIN
// Set app angle to degrees
AAngle:=2;
MSGBOX("Ready.");
END;

//RESET()
//BEGIN
// MSGBOX("RESET");

```

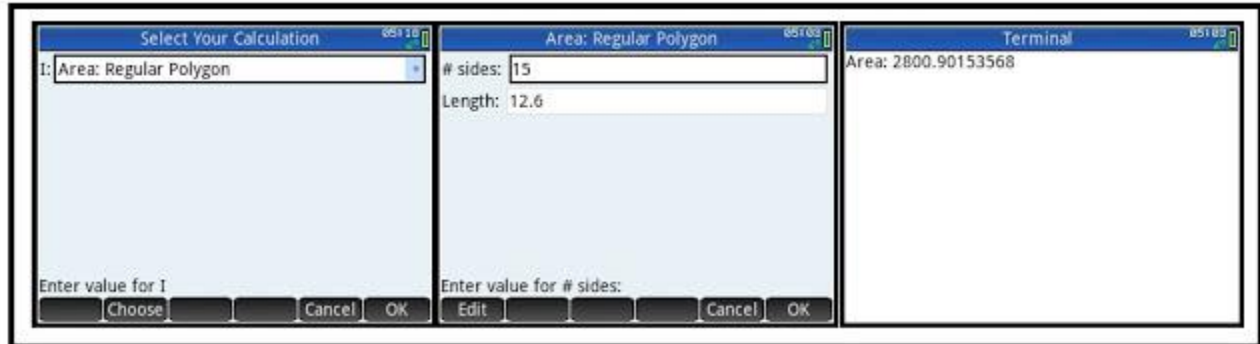


```
//END;

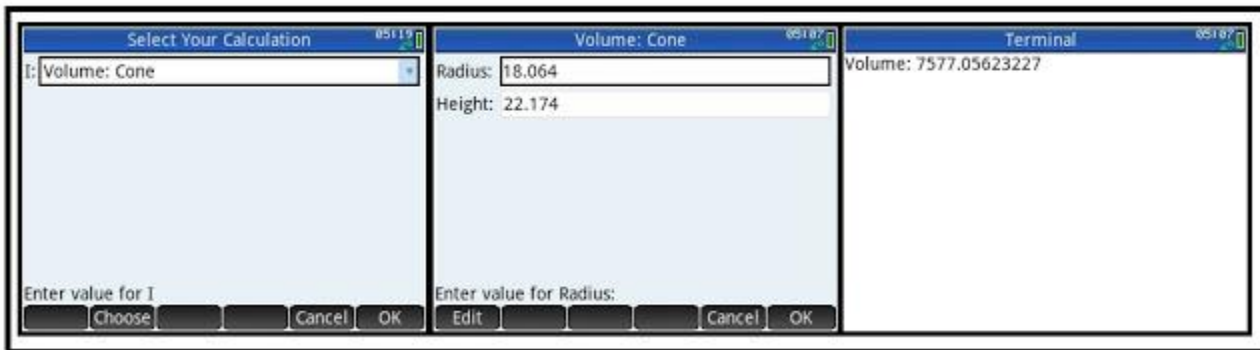
//VIEW "Views", Views()
//BEGIN
// MSGBOX("Views");
//END;
```

Examples

Example 1: Area of a Polygon



Example 2: Volume of a Cone



I plan to post another example by next week, that one will involve plotting.

Eddie

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