The Tutorial Series

This is the first issue of a series of tutorials for the HP Prime, written by Edward Shore. If you have programmed with the HP 39g, 39g or 39gII, you will recognize the programming as the HP Prime programming language (HPPP) is similar. We are using the latest firmware in this series, available on the website.

How to start?

1. Press Shift + 1 (Program).

2. Press New. It is the second touch key.

3. Enter the name of the program. Pressing the ALPHA key twice will turn on UPPERCASE ALPHA–LOCK. Pressing ALPHA, Shift, ALPHA will turn on lowercase alpha-lock. To exit any lock, press the ALPHA key one more time. When you're happy with the name, press Enter.

Rules for Program Names:

1. Letters, numbers, and the underscore character (_) only.

2. The program name must start with a letter.

Structure of a HP Prime Program

A HPPP program is encased of an EXPORT – BEGIN – END structure. The layout is generally like this:

```plaintext
EXPORT  program_name(arguments)
BEGIN
  commands and comments go here
END;
```

Each line containing a command generally must end with a semicolon (;). A semicolon can be typed by pressing ALPHA then the Plus key ( + ). Comments can be typed. They are designated by two forward slashes. The slashes are typed by pressing the Divide key ( ÷ ). Anything in the line following the two slashes is ignored in running the program.
SQIN

Our first program is SQIN, because “Hello World” programs are so 2000s. SQIN takes a number, squares it, then calculates the reciprocal. In short we are defining a custom function:

\[ SQIN(x) = \frac{1}{x^2} \]

Commands:

**RETURN**: returns a result to the stack (home page). You can return numbers, lists, vectors, matrices, strings, or a combination of these times.

**Access**: Tmplt, 1. Block, 2. RETURN

```plaintext
EXPORT SQIN (X)
BEGIN
RETURN 1/X^2;
END;
```

How to run the programs:

**Home Mode - Textbook Entry,**
**Home Mode - Algebraic Entry,**
**CAS Mode:**

Type the program name. Follow the name with parenthesis and enclose the required arguments.

Or use the Toolbox (top row of white keys, 2nd key from the left, it looks like a tool box), select the User touch key, select the program, and input the required arguments.

**Home Mode - RPN Entry:**

Enter each argument, separate each entry by pressing the Enter key. Type the name, and in the parenthesis state the number of arguments.

For example, if the program TEST has four arguments, the RPN stack would like this:

```
4: argument_1
3: argument_2
2: argument_3
1: argument_4
```

TEST(4) to run the program.

Examples to try with SQIN:

SQIN(5) returns .04
SQIN(36) returns .000771604938

**TIP!**

You can check the syntax of the program just by pressing the Check soft key in the program editor. HP Prime will inform you if there is a syntax error and attempt to point you to the error. If there are no syntax errors, the Prime states “No errors in the program.” I use the Check Command all the time.
MOPMT

LOCAL: Declares any variables to be local to the program. In other words, the variables are created, used, possibly displayed during program execution, and deleted at program termination.
Access: Tmplt, 4. Variable, 1. LOCAL

MOPMT calculates the monthly payment of a loan. The arguments are: the loan amount (L), the interest rate (R), and the number of months (M).

EXPORT MOPMT(L, R, M)
BEGIN
LOCAL K:=R/1200;
K:=L*K/(1-(1+K)^-M);
RETURN "Payment ="+K;
END;

Examples:
MOPMT(4000, 9.5, 30) returns 150.317437565
MOPMT(370000, 3.5, 360) returns 1661.46534383

TIP!
You can declare local variables and assign an initial value at the same time. For example: LOCAL K:=1; stores 1 in K and makes K a local variable.

TIP!
Use RETURN, TEXTOUT_P, and PRINT to return custom strings, which combine results, messages, and calculations. Parts are connected with a plus sign.

Try this and next time in the series I will highlight other things we can do with HPPP.