Numerical Analysis and Programming

Lab Worksheet #1

1. Familiarize yourself with IDLE. You can consult the user manual at `http://docs.python.org/2/library/idle.html`.

2. Start the Python interpreter and type `help()` to start the online help utility. For example, you can type `help('keywords')` to get all the Python keywords.

3. Start the Python interpreter and use it as a calculator. Python's syntax for math operations is almost the same as standard mathematical notation. For example, the symbols +, − and / denote addition, subtraction and division, as you would expect. The symbol for multiplication is `*`.

   (a) Find the definition of operators `//` and `%` from the python documentation.

   (b) Find the values of `5/3` and `5.0/3`.

   (c) Find the values of `5//3` and `5.0//3`.

   (d) Find the values of `5%3` and `5.0%3`.

   (e) Find the values of `5.0/-3`, `5.0//-3` and `5.0%-3`.

   (f) Use the built-in function `divmod()` to find the quotient and remainder of `5.0/-3`. You can use `help` to find the definition of `divmod()`.

4. You need to import the `math` library to perform the following tasks.

```
>>> import math
```

   (a) Explore the math library by using the command `dir`. Print out the value of $\sin(0.3\pi)$.

   (b) Evaluate the expressions `math.floor(5.0/3)` and `math.floor(5.0/-3)`.

   (c) Show that `a//b=math.floor(a/b)` and `a%b=a-math.floor(a/b)*b`.