CPSC 1301, Computer Science I Lab Assignment

Lab 03b

Problem 1

Write a Python program that accempts two floating point numbers as command line arguments and illustrates the following arithmetic operations:

- addition
- subtraction
- multiplication
- fractional division
- integer division
- square (exponentiation)

```
#--------------------------------------------------------------------------
# floatops.py
#--------------------------------------------------------------------------

import sys

# Accept two floats a and b as command-line arguments. Use them
# to illustrate float operators. Write the results to standard output.

a = float(sys.argv[1])
b = float(sys.argv[2])

total = a + b
diff  = a - b
prod  = a * b
quot  = a / b
quotint  = a // b
exp   = a ** b

print(str(a) + ' +  ' + str(b) + ' = ' + str(total))
print(str(a) + ' -  ' + str(b) + ' = ' + str(diff))
print(str(a) + ' *  ' + str(b) + ' = ' + str(prod))
print(str(a) + ' /  ' + str(b) + ' = ' + str(quot))
print(str(a) + ' //  ' + str(b) + ' = ' + str(quotint))
print(str(a) + ' ** ' + str(b) + ' = ' + str(exp))
```

Problem 2

Write a Python program that accepts a command line argument of (1) test, (2) game, or (3) none, and prints `study` if test, `sleep` if game, or `party` if none.

```
#-----------------------------------------
```

```
# dowhat.py
#-----------------------------------------

import sys

activity = sys.argv[1]

if activity == "test":
    print("study")
elif activity == "game":
    print("sleep")
else:
    print("party")
```

Problem 3

Write a Python program that accepts a floating point grade and prints the appropriate letter grade, i.e., A, B, C, etc.

```
#-----------------------------------------
# grades.py
#-----------------------------------------

import sys

lettergrade = float(sys.argv[1])

if lettergrade >= 90:
    print( 'A')
elif lettergrade >= 80:
    print( 'B')
elif lettergrade >= 70:
    print( 'C')
elif lettergrade >= 60:
    print( 'D')
else:
    print( 'F')
```

Problem 4

Write a Python program that accepts a year (like 2021) and returns True if the year is a leap year, and False otherwise. 2020 will return True; 2021 will return False.

```
#-------------------------------------------------------------------------
# leapyear.py
#-------------------------------------------------------------------------

import sys

# Accept an int year as a command-line argument. Write True to
```

```
# standard output if year is a leap year.  Otherwise write False.

year = int(sys.argv[1])

isLeapYear = (year % 4 == 0)
isLeapYear = isLeapYear and (year % 100 != 0)
isLeapYear = isLeapYear or  (year % 400 == 0)

print(isLeapYear)
```

Problem 5

Write a Python program that flips a coin X times and comptes the "fairness."

```
#-----------------------------------------------------------------
# flip.py
#-----------------------------------------------------------------

import random

# Simulate a coin flip by writing 'Heads' or 'Tails' to standard
# output.

number = 1000
heads = 0
tails = 0
for i in range(number):
    if random.randrange(0, 2) == 0:
        #print('Heads')
        heads += 1
    else:
        #print('Tails')
        tails += 1

print("tails = %d, heads = %d, fairness = %f" % (tails, heads, heads / number))
```

Problem 6

Write a Python program that prints ten "Hellos."

```
#-----------------------------------------------------------------
# tenhellos.py
#-----------------------------------------------------------------

# Write 10 Hellos to standard output.

print('1st Hello')
print('2nd Hello')
print('3rd Hello')

i = 4
while i <= 10:
    print(str(i) + 'th Hello')
    i = i + 1
```