

Exercises, Week 1, Day 1

Solutions

1. Write a script that prints out the numbers from -5 to +5, inclusive. There are at least four ways of doing this. See how many you can get.:

```
for x in range (-5, 6):
    print x

for x in range (11):
    print x - 5

x = -5
while (x <= 5):
    print x
    x = x + 1

for x in [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5]:
    print x
```

2. Write a function that accepts an integer and returns a list of the factors of that number. (Note: A factor is any integer that can be multiplied to give the target number. The factors of 3 are [1, 3], the of 6 are [1, 2, 3, 6], of 15 are [1, 3, 5, 15].):

```
def listfactors (n):
    theResults = []
    for i in range (1, n/2+1):
        if ((n % i) == 0):
            theResults.append (i)
    theResults.append (n)
    return theResults
```

3. Write a function that takes two strings and calculates the Hamming distance between them. (Note: given two strings of equal lengths, the Hamming distance is the number of differences between them, i.e. the number of substitutions required to make them identical.):

```
def hamming (str_1, str_2):
    theDist = 0
    for i in range (len (str_1)):
        if (str_1[i] != str_2[i]):
            theDist += 1
    return theDist
```

1. Modify it to allow case-sensitive comparison:

```
# insert this at the top of the function ...
str_1 = str_1.lower()
str_2 = str_2.lower()
```

2. Modify it to catch possible errors in the entry data:

```

# insert this at the top of the function ...
assert (type (str_1) == type (')), "string 1 isn't a string"
assert (type (str_2) == type (')), "string 2 isn't a string"
assert (len (str_1) == len (str_2)), "strings are of un-
equal length"

```

4. Write a function that asks the user for a phrase and then prints that phrase flanked above and below with lines of asterisks of equal length. For example:

```

thePhrase = raw_input ("Give me a phrase: ")
theLen = len (thePhrase)
for i in range (theLen):
    print "*",
print
print thePhrase
for i in range (theLen):
    print "*",
print

```

5. When converting between degrees Celcius & Fahrenheit, 0 C equals 32 F, while 100 C is 212 F.

1. Write functions that convert Celcius to Fahrenheit and vice versa.:

```

# why did I write '100.0' and not just '100'?
def celciusToFahrenheit (degrees):
    return (degrees / 100.0) * (212.0 -
32.0) + 32.0

def fahrenheitToCelcius (degrees):
    return (degrees - 32.0) / (212.0 - 32.0) * 100.0

```

2. Write standalone scripts that accept commandline arguments and do the same.:

```

# put the above functions in a file, add
# the below, and call like 'python c2f 212':
if (__name__ == "__main__"):
    import sys
    print celciusToFahrenheit (float (sys.argv[1]))

```

3. Write a single function or script that can handle both conversions, depending on passed arguments.:

```

def convertTemp (degrees, source_scale):
    if (source_scale == 'c'):
        return celciusToFahrenheit (degrees)
    elif (source_scale == 'f'):
        return fahrenheitToCelcius (degrees)

```