Sample Midterm

Part A: Quiz-like questions (20 minutes)

A multiple choice quiz on the course contents taken via D2L. If you studied for the exam by reading through the slides are have a good memory, you gain time for Part B. A sample question:

Napier's Bones:

○ refers to the discovery of dinosaur remains off the cost of Scotland after software used for petroleum exploration off Aberdeen labeled an area "suspicious"
○ are numbering rods with a logarithmic scale used to multiply numbers, a precursor to the slide rule
○ refers to an alternative method of multiplying and dividing numbers implemented in modern digital computers.
○ are measurement sticks used in geology.

Part B: Simple Python Programs (20 minutes)

1. Write a Python program that asks the user for a length in yards and returns the length in meters, rounded to the nearest centimeter. One meter is 1.09361 yards.

```
yards = float(input('Enter a length in yards'))
print( 'This is', round(yards/1.09361,2) meters )
```

2. Write a Python function that takes a string and replaces all occurrences of the letter 'u' with 'v' and of the letter 'U' with 'V'

```
def change(a_string):
    result = [ ]
    for character in a_string:
        if character == 'u':
            result.append('v')
        elif character == 'U':
            result.append('V')
        else:
            result.append(character)
    return ''.join(result)
```

3. Write a Python function that calculates $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \ldots + \frac{1}{n^2}$, where n is the number given as the argument to the function.

```python
def super_harmonic(n):
    result = 0
    for i in range(1, n+1):  #notice stop value of n+1
        result += 1/i**2
    return result
```

4. Write a Python function that writes a conversion table using format from US Dollars to Chilean Pesos. The table should have entries for 1, 2, 5, 10, 20, 50, and 100 dollars. Currently, a dollar is 723.10 Chilean pesos. The pesos should be rounded to the nearest integer. The dollars should be displayed as a floating point number with 2 decimal digits.

```python
def conversion_table( ):
    for dollars in [1, 2, 5, 10, 20, 50, 100]:
        pesos = round(723.10*dollars)
        print( '{0:7.2f}   {1:7d}'.format(dollars, pesos))
```