COMP 10280
Programming I (Conversion)
Practical Sheet 4.5
Tuesday, 4 October 2016

For each of the following programs, when asked for a `float`, use the first four digits of your student number as the amount before the decimal point and the last four digits as the amount after the decimal point.

You should also experiment with **indentation** in your code, to (a) see what error messages are generated by the interpreter and (b) to see the effect on the execution of your programs.

1. Write a program that takes as input an amount of currency (a `float`) and an exchange rate to another currency (a `float`) and prints out the value of the original amount in the other currency. For the exchange rate, pick two currencies and use today's exchange rate.

   When the currency amount is entered by the user, the program should check that the amount is non-negative. If the amount is negative, the message "Amount must be >= 0. Please try again." should be printed out and the program should exit.

   Save this program as `p4-5p1.py`.

2. Write a program that takes as input a single length (a `float`) and calculates the following:

   - The area of a square with side of that length
   - The volume of a cube with side of that length
   - The area of a circle with radius of that length
   - The volume of a sphere with radius of that length
   - The volume of a cylinder with radius of that length and side of that length

   Import the `math` module and use the constant `math.pi` for the value π.

   When the length is entered by the user, the program should check that it is non-negative. If the length is negative, the message "Length must be >= 0. Please try again." should be printed out and the program should exit.

   Save this program as `p4-5p2.py`.

3. Write a program that takes as input an amount of income (a `float`), divides the amount in the ratio 60:40, calculates the tax due according to two different tax rates (23% on the larger amount and 41% on the smaller), and prints out the initial amount, the two different tax amounts, the total tax and the total nett income (initial amount plus taxes).

   When the amount is entered by the user, the program should check that it is non-negative. If the amount of income is negative, the message "Amount of income must be >= 0. Please try again." should be printed out and the program should exit.

   Save this program as `p4-5p3.py`.

Please upload your work to the Moodle site before evening.

You should keep a copy of your programs for your portfolio.