

Introduction to Computer Science

Homework Two

Due Sunday January 16, 2011

General Instructions

- Email me the program as a .py attachment.
- Name your programs with a helpful name. Include your name somewhere in the file name.
- Your program should be fully commented. Be sure to include your name and the date and an overall description of what the program does, in addition to any other comments that are needed.

1. Write a program that does the following:

- (a) Greets the use and introduces the program.
- (b) Prompts the user for an amount of money in Euros.
- (c) Prints the corresponding amount in US Dollars.
- (d) Prints a farewell message.

If you want to do some other currency conversion, or any other conversion, that's ok.

2. Write a program that calculates the future value of an investment, given a percentage growth rate and the initial amount of the investment. The program should:

- (a) Prompt the user to input an amount of money.
- (b) Prompt the user to enter the annual percentage growth of the investment.
- (c) Prompt the user to enter a number of years n .
- (d) Prints the value of the investment in n years.
- (e) Print a farewell message.

3. Write a program that calculates the area of pizzas. Use the math module to get the value of π . The program should:

- (a) Prompt the user to input the radius r of the pizza.

- (b) Prints the area of the pizza.
 - (c) Prints the area of a pizza with a pizza with radius $r + 2$.
 - (d) Prints the area of a pizza with a pizza with radius $r - 2$.
 - (e) Print a farewell message.
4. **(Optional)** Suppose you want to save for a large purchase a house or college for your kids or something. Instead of depositing a lump sum of money into the bank, instead you deposit a fixed amount of money M every year. The money in the bank earns r percent interest yearly.
- (a) Write a program that, given the yearly deposit amount M , the interest rate r , computes the amount of money in the bank N years from now.
 - (b) Use your program to figure out how much money you would need to deposit every year if you want to have \$20,000 in 20 years. Assume that the interest rate is 3%.
5. **(Optional)** Write a program that iterates the logistic equation, $f(x) = 4x(1 - x)$.
- (a) Have the user enter:
 - i. Two different initial values. Each initial value must be between 0 and 1.
 - ii. The number n of iterates to calculate.
 - (b) The program should then print out n iterates for each of the initial conditions.