Chapter 3 Lab: Decisions

Goal: This project is intended to help you understand logic statements of the form *if* , *elif* , and *else* . You should hand in a *.py* file for each of the below problems. You should use only coding techniques that are discussed in this chapter or previously-covered chapters. Please name and number the problems appropriately (something like *Ch3Lab_1_YourName.py*). Each should contain extensive comments in the style discussed in class.

1. Write a program to prompt and read in real-number values for the coefficients a, b, and c of the quadratic equation $ax^2 + bx + c = 0$. Find both roots of the equation using the quadratic formula. If a solution is imaginary, output *no real solutions*. Display both real solutions, if there are any. Test with $a = 2$, $b = 0$, $c = -4$; and $a = 1$, $b = 3$, $c = -4$.

2. Create a code which asks the user to enter in a five digit integer, then determine if this number is a palindrome (has the same sequence of numbers forwards and backwards). You should use integer arithmetic (no strings), have the user enter in the entire number at one time, and return an error message if they do not enter in a five digit number.

3. Make an online ordering menu for the Taco Shop. You should

   – Ask the user what they want to eat. They can choose from a taco ($.89), soft taco ($.99), burrito ($1.89), or nachos ($2.99). They can choose any combination of items (an order of 2 tacos, 3 burritos and 2 nachos is perfectly fine).
   – Ask the user if they want to add an order of cinnamon chips ($.99) and how many.
   – Ask the user if they want a drink ($.99). If so, have them choose between R.C. Cola, Dr. Pepper, 7UP, or Iced Tea.

   Output the order and total price (ignore tax/tip) to the screen. For example:

   You ordered 1 taco, 1 burrito, 2 orders of cinnamon chips and 1 R.C. Cola for a total of $5.75.
   Thank you for visiting the Taco Shop

   Note this is a MENU, not a free-for-all enter whatever you want program. If the user enters in something invalid, print an error message and exit the code (*exit(1)* will exit a code 'nicely').

4. Write a program to calculate the weekly pay for each employee at the *Dostert Pokémon Corporation*. There are four types of workers, each paid using a certain structure:

   – *Pokémon Trainers* - Pay code 1: Get paid a fixed weekly salary of $1000
   – *Pokémon Gym Leaders* - Pay code 2: Get paid an fixed hourly wage of $20 an hour up to 40 hours a week, then get 1.5 times their hourly wage (time and a half) for every hour over 40 worked in a week.
   – *Pokémon Breeders* - Pay code 3: Get paid a fixed weekly salary of $500 plus 20% of the money earned from each Pokémon sold.
   – *Team Rocket Member* - Pay code 4: Get paid no weekly salary, but receive a commission of $500 for each Pokémon caught during the week.

   Create a code which does the following:

   a. Asks the user to enter a paycode (1-4)
   b. Depending on the paycode, prompts the user for further information
      ⋆ Asks for no more information for pay code 1.
      ⋆ Asks for number of hours worked for pay code 2.
      ⋆ Asks for money earned by selling Pokémon for pay code 3.
      ⋆ Asks for number of Pokémon caught for pay code 4.
   c. Returns detailed information and the *correct* weekly pay. For example:
      Pokémon Breeder: Sold $2000 *worth of Pokémon with a weekly salary of* $500 *for a paycheck of* $900.

   Make sure to thoroughly test your code for each possible worker.