1. Consider the following (unformatted) code:
   ```python
   if x > 3:   if x <= 5:     y = 1  elif x != 6:     y = 2   else:     y = 3 else:     y = 4
   ```
   a. Rewrite it with appropriate indentation so that it is valid Python code.

   b. If \( y \) has the value 2 after executing the above program fragment, then what do you know about the initial value of \( x \)?

You have been hired by the owner of a discount store to write a program to calculate the discount that will be applied to all purchases in the store. The next four questions deal with different discount policies.

2. Write a program to ask the user for a purchase amount and print, the amount and the discount according to the following rule:
   1. No discount if the purchase amount is under $100.
   2. 10% off on the complete purchase amount if purchase amount is greater than or equal to $100.

3. Write a program to ask the user for a purchase amount and print, the amount and the discount according to the following rule:
   1. No discount if the purchase amount is under $100.
   2. 10% off on everything above $100 if the purchase amount is greater or equal to $100.

4. Write a program to ask the user for a purchase amount and print, the amount and the discount according to the following rule:
   1. No discount if the purchase amount is under $100.
   2. 10% off on everything from $100 and above if the purchase amount is greater or equal to $100 but less than $1000..
   3. 15% off on everything from $100 and above if the purchase amount is greater or equal to $1,000 but less than $2000..
   4. 20% off on everything from $100 and above if the purchase amount is greater or equal to $2,000.
5. Write a program to ask the user for a purchase amount and print, the amount and the discount. This problem differs from the previous ones in that it uses a “graduated discount”. This means that different discount rates are applied to new purchases as the amount spent increases.

1. No discount if the purchase amount is under $100.
2. 10% off on everything from $100 and less than $1,000.
3. plus 15% off on everything from $1,000 and less than $2000.
4. plus 20% off on everything from $2,000 and above.

For example, if someone spent $2500 in the store no discount will be applied till $100 is spent. After that a 10% discount will be applied till $1000 is reached. A 15% rate will be applied to the purchases between $1000 up and (but not including) $2000. A 20% discount rate will be applied to all purchases above $2000.

6. Write a program that prints out the numbers 1 and 100, ten numbers per line.

7. Write a program that asks the user for a positive integer, n, where n is less than or equal to 1000. Print out all the odd integers between 1 and n, ten numbers per line.

8. Write a program that asks the user for a positive integer, n, where n is less than or equal to 1000. Print out all the leap years between 1 and n, ten numbers per line.

9. Write a program to input an integer n, and output the sum of its digits.