Python Lab – Lists and Dictionaries, Control Flow and Functions

The following exercises will allow you to practice coding different Python data types, control flow statements, and functions.

1. Use the following list

   words = [‘bat’, ‘ball’, ‘barn’, ‘basket’, ‘badminton’]

   Write the following Python expressions:

   a. Write two Python expressions that evaluate the first and last word in words in alphabetical (dictionary) order
   b. Write a statement that evaluates to true if the String ‘bucket’ is in the list of words.
   c. Write a statement that changes the last word to ‘beach’.

2. Write a program to print out all the even numbers between 1 and 40 excluding 40.

3. Write a program to print out all the numbers that are divisible by 10 from 100 to 1 in descending order.

4. Write a program the prints the following to screen

   ```
   *******
   ******
   *****
   ****
   ***
   **
   *
   ```

5. Write a program that checks to see if a person’s age is greater than or equal to 18. If greater, print out that the person can vote, otherwise print they cannot vote.

6. Write a program that prints out whether a number is positive, negative, or zero.

7. Write a program that requests a list of words from the user and then prints all the 4 letter words to screen, each on a new line.

   Enter word list: [‘stop’, ‘desktop’, ‘top’, ‘post’]
   stop
   post

8. Given a list of grades = [9, 7, 7, 10, 3, 9, 6, 6, 2], write the following:

    a. An expression that evaluates the number of 7 grades
    b. A statement that changes the last grade to 4
    c. An expression that evaluates the maximum grade
    d. A statement that sorts the list of grades
    e. An expression that evaluates to the average of all the grades

9. Write a program that determines each digit of a four-digit number. The program should print the output in the following format (using 1234 as an example):

    The digits in the number 1234 are:
    The first number is 1
    The second number is 2
    The third number is 3
    The fourth number is 4

10. Write a program to that takes a three-digit number from the user and determines if the three-digit number is odd or even and prints the following to screen

    The number 123 is odd.
    The number 124 is even.

11. Write a program that takes in two Strings as input from the user. The program should:

    a. Check if the Strings have the same length and print an appropriate message
    b. If they have the same length, check if the Strings have the same content

12. Write a program that takes a String and prints the number of vowels in the String. The program should also print the number of occurrences of each vowel in the String and print out this value with the appropriate message.

13. Write a program containing a sequence of commands that will extract characters from the name " albert einstein" to make and print a new name "bertie".

14. Write a program to compute the sum of all squares between 1 and 20 (inclusive).

15. Write a program to print out all the even numbers between 100 and 30 including 30 in descending order using the modulus (%) operator.

16. Create a dictionary with a list of shopping items and their associated costs. For example:

```
prices = {
   "banana": 4,
   "apple": 2,
   "orange": 1.5,
   "pear": 3
}
```

Look up the dictionary to calculate and print the total price of your shopping if you purchased on of each item.

17. Write a while loop that prints the integers from 0-9, including both 0 and 9.

18. Write a for loop that iterates over a list of numbers and prints the numbers in the list whose square is divisible by 8. For example, if

lst = [2, 3, 4, 5, 6, 7, 8, 9]

then the number 4 and 8 should be printed.

19. Implement a program that requests an integer from the user and prints on screen the square of all numbers from 0 to up but not including that number.

20. Define a function area() that calculates the area of a rectangle. The function should takes two numbers as input (i.e., length and width) and returns the area corresponding to the following formula – area = l*w