1. Write a series of Python statements that will first ask the user to type today’s exchange rate between US Dollars and Euros. Next, ask the user to type a value in Dollars. Finally, print the equivalent value in Euros.
2. Write a Python statement that reads a numeric value from the user, placing it into a variable named x. Then write a print statement that will print the values x, x2, x3 and x4. Use tab characters to separate the four resulting values. Write a second print statement, but use newline characters instead of tab stops
3. Write three Python statements. The first should read a number from the user that represents a temperature in Fahrenheit, placing the value into a variable named f. The second statement should convert the value into Celsius, placing the result into a variable named c. The third statement should print the values of f and s with a descriptive notation.
4. Write a series of Python statements that will read a number from the user that represents the radius of a circle. Then use a print statement to show the circles diameter, circumference and area. You can import the math module and use the constant math.pi to represent the constant π.
5. Write a series of Python statements that will import the math module, read a number from the user that represents an angle given in radians, and then prints the sine and cosine for the given angle.
6. Try writing a print statement that uses the escape character \b. What do you think this is doing? Try placing several characters before and after the \b. Try typing several in a row after a series of characters.
7. Try writing a print statement that uses the escape character \a. What do you think this is doing? Can you think of a use for this feature?
8. What happens if you try to divide an integer value by zero?
9. The functions max and min can also be used with string arguments. What is the value of max(‘abc’)? Of min(‘abc’)? Can you explain the meaning of the result?
10. Using max and min, can you tell which is larger, the lower case letter ‘a’ or the upper case letter ‘A’? What about ‘a’ and ‘0’?
11. Write a series of Python statements that will read three numeric values from the user, and then print the largest of the three.
12. Write a series of Python statements that will read three strings from the user, and then print them in dictionary order. (Note: you can compare two strings using the relational operators).
13. Three numbers, a, b and c, are called a Pythagorean triple if a2 + b2 = c2. An example is the triple 3, 4 and 5, since 9 + 16 = 25. Pythagorean triples can represent, for example, the length of sides in a right triangle. Write a series of Python statements that will read three numbers into variables named a, b and c and then print a message saying whether or not they are a Pythagorean triple.
14. Using a for loop, print of table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures, ranging from 0 to 100. For each value of c, print the corresponding Fahrenheit temperature.
15. Using a for loop, print a table of powers of x, where x ranges from 1 to 10. For each value x, print the quantity x, x2, and x3. Using tab characters in your print statement to make the values line up nicely.
16. Using a while loop, produce a simple table of sines, cosines and tangents. Make the variable x range from 0 to 3 in steps of 0.1. For each value of x, print the value of math.sin(x), math.cos(x) and math.tan(x).
17. Using a series of nested for loops, find all Pythagorean triples consisting of positive integers less than or equal to 20.
18. Remember the formula for the roots of a quadratic equation. For the equation ax2 + bx + c = 0, the roots are –b +- sqrt(b2 – 4ac) / 2a. If the discriminant (the quantity under the square root) is positive there are two real roots, if zero there is one double root, and if negative there are two complex roots. Write a program toread the values a, b and c and produce a message saying how many roots the equation has and their form.
19. Write a program that will accept as input a series of names and salaries. Using the name “End” to mark the end if the sequence of values. After the values have been entered, print the average salary, and the names and salaries of those individuals with the highest and lowest salary.
20. Hourly workers typically earn overtime when they work more then 40 hours per week. For example, overtime pay might be 150% of the regular salary for the additional hours. Write a Python program that will ask the user for their hourly wage, then for the hours they have worked in the past week. With these two values print the wages earned for the week.
21. Drivers compute their miles per gallon by recording their odometer reading each time they fill the gas tank. Subtracting the previous odometer reading yields the miles traveled, and dividing by the gallons entered yields the miles per gallon.
22. Write a program that reads values from the user until they enter the value -1 for the odometer reading. After the 2nd set of figures, print the miles per gallon for each fill up.
23. What is the effect of a print statement that ends with a comma? Try writing two such statements in succession in a program. Can you think of a use for this behavior?
24. Perhaps surprisingly, a number can be used as the conditional portion of an if or while statement. Experiment with this idea. Under what conditions is a number considered to be true? Can you think of a situation where you might want to use a while loop with an integer condition?
25. Perhaps even more surprising, a string can also be used as the conditional in an if or a while statement. Explore this use. Under what conditions is a string considered to be true?
26. The list function can be used to convert a string into a list, as in list(‘abc’).
27. Explain how to convert the resulting list back into a string.
28. Can slices the used with the del statement? Provide an example to show what will happen.
29. Why is it necessary to have both the functions append and extend? What is the result of the following experession that uses append where it probably intended to use extend?
30. Can you use the addition assignment operator, +=, with two lists? What is the result?
31. Show how to use the is operator to demonstrate that assignment creates a duplicate reference, and not a true copy. Then use the same operator to demonstrate that a slice assignment does create a copy.
32. What happens if you pass a three element tuple to the function sneaky? What error message is produced? What happens if you pass a three element string?
33. Show how to get the effect of the lst.append operator with a combination of lst.insert and len.
34. Suppose you use the lst.remove operator to remove an element that is repeated in a list. For example, removing the value 3 from the list [1, 2, 3, 4, 3, 5, 3]. Which value is removed? What is the effect of remove if the element is not found in the list?
35. What does lst.index do if you search for an element that is not found in the list?
36. What does the lst.insert function do if you pass it a negative offset?
37. What does lst.pop do if you pass it a negative offset? What does it do if you pass it an offset that is larger than the number of elements in the list?
38. What does the string.count function do if the pattern overlaps with itself? For example, suppose you want to count the number of times that the string “sis” occurs in the word “frisisisisisip”. There are two potential values – the overlapping count and the non-overlapping count. Which is produced by the function? Describe a way to find the other value.
39. What does the string.replace function do if the pattern value overlaps with itself? For example, suppose you want to replace all the occurrences of “sis” in “frisisisisisip” with “xix”.
40. What does the string.replace function do if the replacement introduces new instances of the pattern. For example, what if you replace the string “sis” with “xsis” in “frisisisis”.
41. A variation on the split function uses an argument. What does the following produce? Try various other expressions, and explain what value is returned by this version of split.

>>> line = ’12:43:13:24:43”

>>> print line.split(“:”)

1. The module random provides a number of functions that produce random numbers. The most useful are the functions random.random(), which returns a floating point value in the range (0.0, 1.0), and the function random.randint(a, b), which produces a random integer N distributed a<=N<=b. Using the latter, write a function that takes a list and returns a randomly selected element.
2. In an earlier chapter we explained that the range function, normally used in a for statement, actually produces a list. With the benefit of your knowledge of lists, explain what the function range(x, y, z) produces.
3. Using lists, write the function unique(lst) that takes a list as argument, and returns a list in which all duplicate values have been removed. For example, given the input [‘abc’, ‘def’, ‘abc’, ‘xyz’, ‘def’] the function would return [‘abc’, ‘def’, ‘xyz’].
4. What is the result if you convert a dictionary into a list using the list() function?
5. What type of value is returned by has\_key()? Explain why you can nevertheless use this value in a Boolean test, such as an if statement or a while.
6. What error message is produced if you index a dictionary with a mutable type, such as a list.
7. What happens if a global statement refers to a variable that has not been assigned in the global scope. Make a prediction as to what you think should happen, and then write a program to test your hypothesis.
8. What happens when you use a function name, without arguments, in a print statement? What value is produced when you use the type() function on a function name?
9. Explore various other html commands. What does the command <i>text</i> do? How about the <b>text</b> command? How do you produce a numbered list in html? A bulleted list?
10. Write a form that asks the user for a name, and then invokes a python program that produces the lyrics for the name game song. The name game, you will remember, takes a name, such as “sally”, and places it in a rhyme such as the following: “Sally Sally bo Bally! Bananna fanna fo Fally! Fee fi mo Mally! SALLY!”
11. Explore using triple quotes in interactive mode. What can you do with triple quotes that you cannot do with single or double quotes?
12. Explore various other types of html form elements. These include buttons, text lines, text boxes, check boxes, radio button, and pull down menus.