

Introduction to Computing Lab

Fall 2017

FAST-NU Peshawar
Campus

Assignment # 1:

Weightage: 4

Due Date: 22 Oct 2017

A note of warning: Start work on assignments as soon as they are given. Do not underestimate the demanding nature of this course. Expect the system to crash the night before your program is due. Aim to have it done the day before.

Submit the assignment on [slate](#). Do not email me assignments after due date. It will not be accepted in any case. **Students are required to submit actual content written in MS word or Pdf. Hand written/ Scanned assignments will not be accepted.**

1. Write a Python program to find those numbers which are divisible by 7 and multiple of 5, between 1500 and 2700.
2. Write a Python program to convert temperatures to and from celsius, fahrenheit.
3. Write a Python program to guess a number between 1 to 9. User is prompted to enter a guess. If the user guesses wrong then the prompt appears again until the guess is correct, on successful guess, user will get a "Well guessed!" message, and the program will exit.
4. Write a Python program to construct the following pattern, using a nested for loop.

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5. Write a Python program which iterates the integers from 1 to 50. For multiples of three print "Fizz" instead of the number and for the multiples of five print "Buzz". For numbers which are multiples of both three and five print "FizzBuzz".

6. Write a Python program which accepts a sequence of comma separated 4 digit binary numbers as its input and print the numbers that are divisible by 5 in a comma separated sequence.

Sample Data : 0100,0011,1010,1001,1100,1001

Expected Output : 1010

7. Write a Python program to print alphabet pattern 'A' , 'D' , '6' and 'X'. Using loops.
8. To make telephone numbers easier to remember, some companies use letters to show their telephone number. For example, using letters, the telephone number 438-5626 can be shown as GET LOAN. In some cases, to make a telephone number meaningful, companies might use more than seven letters. Write a program that prompts the user to enter a telephone number expressed in letters and outputs the corresponding telephone number in digits. If the user enters more than seven letters, then process only the first seven letters. Also output the – (hyphen) after the third digit. Allow the user to use both uppercase and lowercase letters as well as spaces between words. Moreover, your program should process as many telephone numbers as the user wants.
9. The population of a town A is less than the population of town B. However, the population of town A is growing faster than the population of town B. Write a program that prompts the user to enter the population and growth rate of each town. The program outputs after how many years the population of town A will be greater than or equal to the population of town B and the populations of both the towns at that time. (A sample input is: Population of town A is 5000, growth rate of town A is 4%, population of town B is 8000, and growth rate of town B is 2 %.)

Bonus: Try it to prove you have good programming skills ☺

A high school has 1000 students and 1000 lockers, one locker for each student. On the first day of school, the principal plays the following game: She asks the first student to go and open all the lockers. She then asks the second student to go and close all the even-numbered lockers. The third student is asked to check every third locker. If it is open, the student closes it; if it is closed, the student opens it. The fourth student is asked to check every fourth locker. If it is open, the student closes it; if it is closed, the student opens it. The remaining students continue this game. In general, the n th student checks every n th locker. If the locker is open, the student closes it; if it is closed, the student opens it. After all the students have taken their turn, some of the lockers are open and some are closed. Write a program that prompts the user to enter the number of lockers in a school. After the game is over, the program outputs the number of lockers that are opened. Test run your program for the following inputs: 1000, 5000, 10000. Do you see any pattern developing?

(Hint: Consider locker number 100. This locker is visited by student numbers 1, 2, 4, 5, 10, 20, 25, 50, and 100. These are the positive divisors of 100. Similarly, locker number 30 is visited by student numbers 1, 2, 3, 5, 6, 10, 15, and 30. Notice that if the number of positive divisors of a locker number is odd, then at the end of the game, the locker is opened. If the number of positive divisors of a locker number is even, then at the end of the game, the locker is closed.)