PYTHON LAB
(Skill Based Lab Elective-II)/ (Common for CSE, IT)

COURSE CODE: 15CT11S2

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COURSE OUTCOMES:
At the end of the course the student shall be able to

CO1: Know comprehensions, generators in python.
CO2: Know exception handling in python
CO3: Know file I/O
CO4: Understand various data types like lists, tuples, strings etc
CO5: Know the usage of various predefined functions on the above data types

/PROGRAMMES:

1.a. Write a program to get the list of even numbers upto a given number.
b. Write a program to get the ascii distance between two characters.
c. Write a program to get the binary form of a given number.
d. Write a program to convert base36 to octal.

2.a. Write a program to get the number of vowels in the input string (No control flow allowed)
b. Write a program to check whether a given number has even number of 1's in its binary representation (No control flow, the number can be in any base)
c. Write a program to sort given list of strings in the order of their vowel counts.

3. a. Write a program to return the top 'n' most frequently occurring chars and their respective counts. E.g. aaaaaabbbbcccc, 2 should return [(a 5) (b 4)]
b. Write a program to convert a given number into a given base.
Note: Convert the given number into a string in the given base. Valid base is 2 <= base <= 36
Raise exceptions similar to how int ("XX", YY) does (play in the console to find what errors it raises). Handle negative numbers just like bin and oct do.

4.a. Write a program to convert a given iterable into a list. (Using iterator)
b. Write a program to implement user defined map() function.
Note: This function implements a map. It goes through the iterable and applies func on each of the elements and returns a list of results.
Don't use a for loop or the builtin map function. Use exceptions, while loop and iter.
c. Write a progra m to generate an infinite number of even numbers (Use generator)
d. Write a program to get a list of even numbers from a given list of numbers.(use only comprehensions)

5. Write a program to implement round robin.

Note: This routine to take a variable number of sequences and return elements from them in round robin till each sequence is exhausted. If one of the input sequences is infinite, this is also infinite.
e.g if input is [1,2,3], (4,5) -> yield 1,4,2,5,3 one after the other. Use exception control and comprehensions to write elegant code.
Hint: This requires you to use understand variable arguments, lists, list copy, comprehensions, iterators, generators, exception handling, control flow etc.

6. a. Write a program to sort words in a file and put them in another file.The output file should have only lower case words, so any upper case words from source must be lowered.(Handle exceptions)
b. Write a program return a list in which the duplicates are removed and the items are sorted from a given input list of strings.

7. a. Write a program to test whether given strings are anagrams are not.
b. Write a program to implement left binary search.
Note: Left binary search returns the left most element when a search key repeats.
For e.g if input is [1,2,3,3,4,4,5] and I search 3, it should return 2 as index 2 is the left most occurrence of 3.

8.a. write a class Person with attributes name, age, weight (kgs), height (ft) and takes them through the constructor and exposes a method get_bmi_result() which returns one of "underweight", "healthy", "obese"
b. Write a program to convert the passed in positive integer number into its prime factorization form.
Note: If number = a1 ^ p1 * a2 ^ p2 ... where a1, a2 are primes and p1, p2 are powers >=1 then we represent that using lists and tuples in python as [(a1,p1), (a2,p2), ...]
e.g.[(2,1), (5,1)] is the correct prime factorization of 10

TEXT BOOK:

1. mark Lutz & David Ascher, *"Learning Python"*, Oreilly Publications, 5th edition

WEB REFERENCE:

1. docs.python.com

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