CS594: Python Programming Lab

Take Home Assignment (1 Questions, 100 Points)
Submission Dead Line: 07-Aug-2019 23:59 Hours Pages: 3

IIT Guwahati

01 Aug 2019 (Thu)

Question 1: (100 points)

Implement in Python Programming Language the following problems:

Q1. 10 Marks Read the following input

- A number (Memory size)
- One/Two characters (Memory Units; EB or PB or TB or GB or MB or KB or B or b) and
- One/Two characters (Convert to given units; EB or PB or TB or GB or MB or KB or B or b)

till you are given 0 00 00 as input for all three quantities. Your task is to convert every input from one given unit of memory into another given unit of memory. Example: 249 EB PB

Exa Byte 1 EB = 1024 PB

Peta Byte 1 PB = 1024 TB

Tera Byte 1 TB = 1024 GB

Giga Byte 1 GB = 1024 MB

Mega Byte 1 MB = 1024 KB

Kilo Byte 1 KB = 1024 B

Byte 1 B = 8 Bits

Input generator: 15 Marks Write a Python program to generate input in the above described format. Vary *number* of test inputs randomly. You must generate all possible combinations conversion variations using above three inputs.

Q2. 10 Marks Read one roll number at a time till you read 0 at the end the program. Your task is to count how many students are present in each *programme* given the above information. Information about roll number structure can be found at `https://intranet.iitg.ac.in/acad/pdf/help.pdf`

Input generator: 15 Marks Write a Python program to generate input. Vary number of test inputs randomly. You must generate all possible combinations of input variations (year, programme, discipline, serial number).

Q3. 10 Marks Read the following till you encounter 0 *for each of the value read.*

An integer stands for year in the format YYYY

Following characters stands for the programme: BTech or BDes or MSc or MA or MTech or MDes or MS(R) or PhD or Dual (MTech + PhD) or Dual Degree (MS(Engg.) + PhD)

Following characters stands for discipline as given in third column of table given under the heading `Third part (c)` of the document `https://intranet.iitg.ac.in/acad/pdf/help.pdf`. Do not forget to include Data Science.

An integer stands for the serial number of the student

Your task is to **generate** a roll number given the above information.

Sample Input/Output:

Year	Program	Branch	Number	Output
2018	BTech	CSE	1	180101001
2018	BTech	ECE	2	180102002
2018	BTech	ME	3	180103003
2018	BTech	CE	4	180104004
2018	BDes	Design	5	180205005
2018	BTech	BSBE	6	180106006
2018	BTech	CL	7	180107007
2018	BTech	EEE	8	180108008
2018	BTech	EP	21	180121021
2018	BTech	CT	22	180122022
2018	BTech	MC	23	180123023
0	0	0	0	End of program

Input generator: 15 Marks Write a Python program to generate the input in the above described format. Vary *number* of test inputs randomly. You must generate all possible combinations programme and branch of input variations.

Q4. 10 Marks Read an hexadecimal number of the following format

String of characters from the set {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, a, B, b, C, c, D, d, E, e, F, f}

A Dot .

String of characters from the set {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, a, B, b, C, c, D, d, E, e, F, f}

Your task is convert the above input into a fractional decimal number **Example**: hexadecimal 3c7d9f.a1b7c8d $--> 3964319.631710577756166458 12$

Input generator: 15 Marks Write a Python program to generate the input in the above described format. Vary *number* of test inputs randomly. You must generate as many possible combinations of input variations as possible.

Instructions Directory Structure Create a directory with its name as your roll number. Inside this directory, create four sub directories whose names are Q1, Q2, Q3 and Q4. Place the python programs for for question 1 in Q1 directory. Similarly other programs must be stored in respective sub directories. The python program must have an extension string `.py`

tar gzip Create (roll number).tar.gz file using the above directory structure

Email Email the above tar gzip file to the CS594 TA `vaibhav18@iitg.ac.in` as per the above given dead line

Copying You should avoid indulging in copying. Every submission will be subject to software similarity using the tool `Measure of Software Similarity` available at `https://theory.stanford.edu/~aiken/moss/`. Two submissions having similarity score equal to or more than 40.0% will be declared copied. If you are found involved in copying act, your name will be referred to disciplinary committee. Therefore you are requested to place individual efforts and avoid copying.

Marking Scheme Q1 5 Marks Correct `If-else` structure with correct logic

Q1 5 Marks Correct `loop structure` with correct logic

Q1-input 10 Marks Generating all combinations of second input and third input

Q1-input 5 Marks For generating corner cases

Q2 3 Marks Correct `If-else/switch` structure with correct logic

Q2 3 Marks Correct `Identification` of programme, discipline and serial number

Q2 4 Marks Correct `loop structure` logic

Q2-input 10 Marks Generating all combinations of programme and discipline and serial numbers

Q2-input 5 Marks For generating corner cases

Q3 4 Marks Correct extraction of year, programme, discipline from the input

Q3 3 Marks Correct `loop structure` with correct logic

Q3 3 Marks Correct `conditional statemets` usage with correct logic

Q3-input 10 Marks Generating all combinations of programme and discipline strings

Q3-input 5 Marks For generating corner cases

Q4 4 Marks Correct computation of decimal number

Q4 4 Marks Correct computation of fractional number

Q4 2 Marks Correct `conditional statemets` usage with correct logic

Q4-input 10 Marks Generating all combinations of digits with alpabets

Q4-input 5 Marks For generating corner cases