SALT LAKE SCHOOL
COMPUTER SCIENCE DEPT.
CLASS XI COMPUTER ASSIGNMENTS (PART 2)
Date: 06 January 2022

Instructions: Each of the assignment must have the topics given below

a. **Program description (brief introduction about the program)**
b. **Algorithm (focus must be given to the logical area of the program clearly by explaining step by step concept in simple language, try not include operators used in the programming language as algorithm is basically language independent)**
c. **Source code (program code written in JAVA language with proper comments)→ You can copy the source code and paste in MSWord (by writing source code as heading) or can give screenshot from bluej screen**
d. **Output(atleast two different outputs to be given)→(have to take screenshot from BlueJ output screen)**
e. **Variable listing(having the headings as variable name, datatype, scope of the variable, purpose of the variable)**

NOTE: ALL THE TOPICS for each assignment must be written in digital format in a single MSWORD file, which need to be submitted on the date specified at the end of the assignments given below.

Write main method only to create object and call the method(s). Each of your code must follow DATA HIDING CONCEPT. Write separate class for each assignment which will contain main method.

Marks will be also given for good presentation of your file.

Q11. Design a class Change to perform string related operations. The details of the class are given below:
Class name: Change
Data Members/instance variables:
str: stores the word
newstr: stores the changed word
len: store the length of the word
Member functions:
Change(): default constructor
void inputword( ): to accept a word
char caseconvert (char ch): converts the case of the character and returns it
void recchange (int): extracts characters using recursive technique and changes its case using caseconvert () and forms a new word
void display (): displays both the words
Specify the class Change, giving details of the Constructor ( ), member functions void inputword (), char caseconvert (char ch), void recchange (int) and void display (). Define the main () function to create an object and call the functions accordingly to enable the above change in the given word.

Q12. A class DeciOct has been defined to convert a decimal number into its equivalent octal number. Some of the members of the class are given below:
Class name: DeciOct
Data members/instance variables:
n: stores the decimal number
oct: stores the octal equivalent number
Member functions:
DeciOct(): constructor to initialize the data members n = 0, oct = 0.
void getnum(int nn): assign nn to n

void deci_oct(): calculates the octal equivalent of 'n' and stores it in oct using the recursive technique
void show(): displays the decimal number 'n', calls the function deci_oct() and displays its octal equivalent.
Specify the class DeciOct, giving details of the constructor( ), void getnum(int), void deci_oct( ) and void show(). Also define a main() function to create an object and call the functions accordingly to enable the task.

Q13. Design a class Exchange to accept a sentence and interchange the first alphabet with the last alphabet for each word in the sentence, with single-letter word remaining unchanged. The words in the input sentence are separated by a single blank space and terminated by a full stop. [10]
Example:
Input: It is a warm day.
Output: tIsi a mraw yad
Some of the data members and member functions are given below:
Class name: Exchange
Data members/instance variables:
sent: stores the sentence
rev: to store the new sentence
size: stores the length of the sentence
Member functions:
Exchange(): default constructor
void readsentence(): to accept the sentence
void exfirstlast(): extract each word and interchange the first and last alphabet of the word and form a new sentence rev using the changed words.

void display(): display the original sentence along with the new changed sentence.
Specify the class Exchange giving details of the constructor ( ), void readsentence (), void exfirstlast () and void display (). Define the main () function to create an object and call the functions accordingly to enable the task.

Q14. Write a program which takes a string (maximum 80 characters terminated by a full stop. The words in this string are assumed to be separated by one or more blanks.
Arrange the words of the input string in descending order of their lengths. Same length words should be sorted alphabetically. Each word must start with an uppercase letter and the sentence should be terminated by a full stop.

Test your program for the following data and some random data.

SAMPLE DATA:
INPUT:
"This is human resource department."

OUTPUT:
Department Resource Human This Is.

INPUT:
"To handle yourself use your head and to handle others use your heart."

OUTPUT:
Yourself Handle Handle Others Heart Head Your YourAnd Use Use To To.

Q15.A magic square of order n is an arrangement of n^2 numbers, usually distinct integers, in a square, such that the n numbers in all rows, all columns, and both diagonals sum to the same constant. A magic square contains the integers from 1 to n^2. Value of n must be considered as an odd number.

Input: n=3

Output:

Magic Square of size 3:

2 7 6

9 5 1

4 3 8

Input: n=5

Output:

Magic Square of size 3:

9 3 22 16 15

2 21 20 14 8

25 19 13 7 1

18 12 6 5 24

11 10 4 23 17

Input: n=6

Output:

Invalid data

Q16. A special pure number is a number if

a) It has even number of digits
b) It contains digits 4 or 5
c) It is a palindrome number.

Write a program to accept a positive number N from the user and print first Nth positive special pure numbers. Value of N must be less than or equal to 10.

Input: N=4
Output: 44 55 4444 4554

Input: N=10
Output: 44 55 4444 4554 5445 5555 444444 454454 544445 554455

Input: N=12
Output: OUT OF RANGE.

Q17.Write a program to declare a square matrix A[ ][ ] of order (m) where 'm' is the number of rows which be greater than 3 and less than 20.
Allow the user to input positive integers into this matrix. Perform the following tasks on the matrix:

(a) Print the original matrix.
(b) Sort only the BOUNDARY elements in descending order using anystandard sorting technique.
(c)Print modified array and the diagonals in matrix format..

Test your program for the following data and some random data.
1. Example :
INPUT : M=4

1 7 4 9
8 2 5 6
6 3 9 2
3 6 8 1

OUTPUT :
ORIGINAL MATRIX :
1 7 4 9
8 2 5 6
6 3 9 2
3 6 8 1

REARRANGED MATRIX : DIAGONALS:

9 8 8 7 9 7
1 2 5 6 2 5
1 3 9 6 3 9
2 3 4 6 2 6

Q18. Write a program which will accept a positive natural number from the user which will not exceed four digits. The program will print the display the number in words as shown in the example. The program will be repeated for as many times the user wants.

Example:-
Input--Enter a number ----- 132456
Output –Invalid entry

Want to continue?(y/n)-------y
Enter a number ----- 1532
Output----One Thousand Five Hundred and Thirty Two

Want to continue?(y/n)-------n

Q19.Write a Java program to input a sentence from the user in lowercase and removes the first and the last characters of every word in it.

Sample Input :i love java for school.
Sample Ouptut :ovav o choo

Some of the data members and member functions are given below:

Class name : Remove

Data members/instance variables:
sent : stores the sentence
rem : to store the new sentence
size : stores the length of the sentence

Member functions:
Remove() : default constructor
void readsentence() : to accept the sentence
void remfirstlast() : extract each word and remove the first and the last alphabet of the word and form a new sentence '**rem**' using the changed words.
void display() : display the original sentence along with the new changed sentence.

Specify the class **Remove** giving details of the constructor **Remove ()**, **void readsentence()**, **void remfirstlast()** and **void display()**. Define the **main()** function to create an object and call the function accordingly to enable the task.

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Q20.A sentence is terminated by either "." , "!" or "?" followed by space. Input a piece of text consisting of sentences. Assume that there will be a maximum of 10 sentences in block letters.
Write a program to:

a) Obtain the length of the sentence (measured in words) and the frequency of vowels in each sentence.
b) Generate the output as shown below using the given data.

Sample Data:

INPUT: HELLO! HOW ARE YOU? HOPE EVERY THING IS FINE. BEST OF LUCK.

OUTPUT:

Sentence	No. of Vowels	No. of Words
1	2	1
2	5	3
3	8	4
4	3	3

Sentence	No. of Vowels/ Words
1	VVVVVV
	WWW
2	VVVVVVVVVVVVVV
	WWWWWWWWW
3	VVVVVVVVVVVVVVVVVVVVVV
	WWWWWWWWWWWW
4	VVVVVVVVV
	WWWWWWWWW

Assignment number	Date
Assignment 11	**10.08.21**
Assignment 12	**20.08.21**
Assignment 13	**07.09.21**
Assignment 14	**15.09.21**
Assignment 15	**27.09.21**
Assignment 16	**04.10.21**
Assignment 17	**12.11.21**
Assignment 18	**23.11.21**
Assignment 19	**13.12.21**
Assignment 20	**23.12.21**

Date of submission : 10th January 2022 **Try to complete as early as possible. Marks of the assignment will be considered for Internal assessment.**

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Note: Continue in the same word file . If any changes are required for first 10 assignments, then update them first and then start with the remaining assignments given. Add a final index page at the beginning of all the assignments with the headings assignment number, assignments details in brief, page number, date and teacher signature column.