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PRACTICAL LIST OF JAVA PROGRAMMING LAB (MCA-253)

BASIC PROGRAMS:

1. Find the maximum and minimum number in a user- entered array of integers using conditional operator.
2. Write a program that will read a float type value from the keyboard and print the following output.
->Smallest Integer not less than the number,
->Given Number.
->Largest Integer not greater than the number.
3. WAP that generate 5 random integers between a user defined range (e.g. 1-100).
4. WAP that print the biggest and smallest 3 digits numbers, which has sum of its digits equal to product of those digits.
5. There are three types of numbers :
 - a) Abundant number: A number which is smaller than the sum of its proper divisors. For example, 12 is an abundant number because the sum of its proper divisors $1+2+3+4+5=16(>12)$.
 - b) Deficient Number: A number which is greater than the sum of its proper divisors.
 - c) Perfect Number: A number which is equal to the sum of its proper divisors.Now, read a number from the user and verifies which type of number it is.
6. WAP that convert the given number of days into months and days (assuming, each month of 30 days);
e.g. :
Input — 69
Output — 69 days 2 months & 9 days.
7. In general, a Armstrong number of n digits is equal to the sum of its digits raise to the power of n, e.g. 153 is a Armstrong number because $153=1^3+5^3+3^3$.
WAP that verifies whether a user entered number (of any number of digits) is Armstrong or not.
8. WAP that prints the following pattern :
ABCDEFGGFEDCBA
ABCDEFEDCBA
ABCDEEDCBA
ABCDDCBA
ABCCBA
ABBA
AA
9. WAP that reads the names of the students in a class and store them a string array and consequently print the names in a sorted order (without using the built-in string function sort() for string API).

10. WAP that performs following operations on strings (without using string API) :
- Reverse a string.
 - Check whether a string is palindrome or not.
 - Compare two strings.
 - Find a substring in a given string & print its position.
 - Concatenate two strings.
 - Convert a string into array of characters.
 - Sort the characters in a string.
 - Print the character with the second highest frequency in a given string along with its frequency.

PROGRAMS ON CLASSES & INHERITANCE:

11. Create a package 'Arithmetic' containing two classes 'Rational' and 'Complex' :
- Rational performs arithmetic with rational numbers. Use integer variables to represent private instance variables of the class: numerator and denominator. Write a constructor method that enables an object of this class and use toString method to display the object. Simulate addition, subtraction, multiplication and division of rational numbers.
 - Complex performs arithmetic for complex numbers. Simulate addition, subtraction and multiplication of complex numbers. Introduce 'this' keyword.
12. Toggle the nth bit in an integer.
13. Implement an abstract class stack with methods: push, pop and display for two classes StaticStack and DynamicStack. StaticStack uses one dimensional integer array to store numbers and DynamicStack uses an integer ArrayList to store.
14. Create an abstract base class called Shape. It should contain 2 abstract methods: getcoord() and howCoord() to accept X and Y coordinates, and one normal method to display the coordinates (i.e. showCoord()). Create a sub class called Rect that inherit the Shape class and define its abstract functions and call the showCoord() method of its superclass using super keyword. In main method, execute the showCoord() method of the Rect class by applying the dynamic method dispatch concept.
15. WAP that demonstrate the difference between final, finally and finalize.

PROGRAMS ON String Buffer, Wrapper classes, access modifiers, packages & interfaces:

16. Perform following operations on StringBuffer in a menu-driven fashion :
- Replace the content of StringBuffer with the user given string.
 - Reverse the content of StringBuffer.
 - Append a value to StringBuffer at the end.
 - Remove a particular character from the StringBuffer.
 - Insert a value at a particular offset in StringBuffer.
 - Convert StringBuffer into String using toString () method of String class.
 - Trim the content Of StringBuffer using substring () method Of String class.
 - Write the contents of StringBuffer to file using BufferedWriter & FileWriter Java class.
17. Perform following operations using wrapper classes in a menu-driven fashion :
- Convert Integer into Java String object and vice-versa.
 - Convert Integer into other primitive data types.

- c) Convert a decimal number into binary & vice-versa.
- d) Convert a decimal number into octal & vice-versa.
- e) Convert a decimal number into hexadecimal & vice-versa.
- 18. Demonstrate the influence of all four access modifiers i.e. PRIVATE, DEFAULT, PROTECTED & PUBLIC using at least two packages.
- 19. Create an interface Shape which must contain two methods- area() and perimeter(). Then create another interface Triangle that extends Shape and a class Rectangle that implements Shape. The interface Triangle should contain three instance variables depicting its three sides and should be further implemented by three classes-Scalene, Isosceles & Equilateral.
- 20. Write a program to implement interface.
- 21. Write a program to implement Packages.

PROGRAMS ON Exception & I/O programming:

- 22. Simulate a bank account. Variables: accountNumber, balance. Methods: deposit, withdraw, getBalance, taxDeduction etc. Use enum for gender. Add a final variable for taxrate. Implement checks such as more money cannot be drawn with withdrawn than balance. In case, this happens, an exception must be
- 23. Write to a file using :
 - a. FileOutputStream
 - b. BufferedWriter.
- 24. Make a file read-only in JAVA.
- 25. Append to a file in JAVA using BufferedWriter, PrintWriter & FileWriter.

PROGRAM ON Applet, Thread and Event Handling

- 26. Write a program to implement the concept of Thread creation and implementation.
- 27. Write a program to implement and create applet.(USING ALL CONCEPT)
- 28. Write a program of Event handling.(USING ALL CONCEPT)

PROGRAMS ON JDBC:

- 29. Create STUDENT table in College DATABASE and insert two rows into this newly created table.
- 30. Update an already created table 'STUDENT' by updating a student's name with 'Mohid' appended before the name, whose name is 'Waseem'.

PROGRAMS ON RMI:

- 31. Write program to implement RMI.