ELERINMOSA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SOFTWARE ENGINEERING

CSE 202 MID SEMESTER PROJECTS FOR 2022/2023 ACADEMIC SESSION

(Kindly note that each student is expected to answer 3 questions as allocated)

1. Write a program that asks the user for a weight in kilograms and converts it to pounds. There are 2.2 pounds in a kilogram. printing the answer rounded to the nearest tenth of a pound.
2. $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ solve this using an input function, where a=3, b=4, c=5;
3. Write a program that asks the user to enter two numbers, x and y, and computes $\frac{x - y}{x + y}$
4. Write a program that asks the user for a number and prints out the factorial of that number.
5. Write a method called repl that accepts a String and a number of repetitions as parameters and returns the String concatenated that many times. For example, the call repl("hello ", 3) should return "hellohellohello" . If the number of repetitions is zero or less, the method should return an empty string.
6. Write a program that prompts user to enter 7 different numbers. The program should print out the maximum number and minimum number.
7. Write a program that asks the user for a number of seconds and prints out how many minutes and seconds that is. For instance, 200 seconds is 3 minutes and 20 seconds.
8. Write a program that checks if a given year by the user is a leap year or not. N.B., the program must only take in a year on user prompt (use a method).
9. Write a program that loops from 1 to 100 but only prints number divisible by 2,5,6 and 10

10. Write a program with a for loop that iterate over characters in an email address, exit the loop when it reaches the symbol '@' and print the part before @ in one line.

11. Generate a random number between 1 and 10. Ask the user to guess the number and print a message based on whether they get it right or not.

12. Write a method called pow that accepts a base and an exponent as parameters and returns the base raised to the given power. For example, the call pow(3, 4) should return 3
* 3 * 3 * 3, or 81. Assume that the base and exponent are nonnegative.

13. Ask the user to enter 10 test scores. Write a program to do the following:
(a) Print out the highest and lowest scores.
(b) Print out the average of the scores.
(c) Print out the second largest score.
(d) If any of the scores is greater than 100, then after all the scores have been entered, print a message warning the user that a value over 100 has been entered.
(e) Drop the two lowest scores and print out the average of the rest of them.

14. Write a program that asks the user to enter a string. The program should then print the following:
(a) The total number of characters in the string
(b) The string repeated 10 times
(c) The first character of the string (remember that string indices start at 0)
(d) The first three characters of the string
(e) The last three characters of the string
(f) The string backwards

(g) The seventh character of the string if the string is long enough and a message otherwise

(h) The string with its first and last characters removed

(i) The string in all caps

(j) The string with every a replaced with an e

(k) The string with every letter replaced by a space

15. Write a method called numUnique that takes three integers as parameters and returns the number of unique integers among the three. For example, the call numUnique(18, 3, 4) should return 3 because the parameters have three different values. By contrast, the call numUnique(6, 7, 6) should return 2 because there are only two unique numbers among the three parameters: 6 and 7 .

16. Write a program that asks the user to enter a list of integers. Do the following:

(a) Print the total number of items in the list.

(b) Print the last item in the list.

(c) Print the list in reverse order.

(d) Print Yes if the list contains a 5 and No otherwise.

(e) Print the number of fives in the list.

(f) Remove the first and last items from the list, sort the remaining items, and print the result.

17. Write a program that generates a random number, x, between 1 and 50, a random number y between 2 and 5, and computes x^y.

18. Write a method called printAcronym that accepts a string as its parameter and prints the first letter of each word of the string as an acronym. For example, the call of printAcronym("Breath of the Wild") should print "BotW" . You may assume that the string contains at least one word and does not have any surrounding whitespace at its start or end.

19. Write a method called number_of_factors that takes an integer and returns how many factors the number has.

20. Write a method called change_case that given a string, returns a string with each uppercase letter replaced by a lower case letter and vice-versa.

21. Write a method called sum_digits that is given an integer num and returns the sum of the digits of num.

22. Write a class called Investment with fields called principal and interest. The constructor should set the values of those fields. There should be a method called value_after that returns the value of the investment after n years. The formula for this is p(1 + i)n, where p is the principal, and i is the interest rate. It should also use the special method __str__ so that printing the object will result in something like below:
Principal - $1000.00, Interest rate - 5.12%

23. Write a class called Product. The class should have fields called name, amount, and price, holding the product's name, the number of items of that product in stock, and the regular price of the product. There should be a method get_price that receives the number of items to be bought and returns a the cost of buying that many items, where the regular price is charged for orders of less than 10 items, a 10% discount is

applied for orders of between 10 and 99 items, and a 20% discount is applied for orders of 100 or more items. There should also be a method called make_purchase that receives the number of items to be bought and decreases amount by that much.

24. Write a method called printRange that accepts two integers as arguments and prints the sequence of numbers between the two arguments, separated by spaces. Print an increasing sequence if the first argument is smaller than the second; otherwise, print a decreasing sequence. If the two numbers are the same, that number should be printed by itself.

Here are some sample calls to printRange :

printRange(2, 7);

printRange(19, 11);

printRange(5, 5);

The output produced from these calls should be the following sequences of numbers:

23 4 5 6 7

19 18 17 16 15 14 13 12 11 5

25. Write a program calculates the grade point of the users, where the program prompts user for the number of courses they are doing, their score in each course and unit of each course, then generates a perfect grade point of the user. N.B., use the school Grade Point (GP) system.

26. Write a method called smallestLargest that accepts a Scanner for the console as a parameter and asks the user to enter numbers, then prints the smallest and largest of all the numbers supplied by the user. You may assume that the user enters a valid number greater than 0 for the number of numbers to read.

Here is a sample execution:

How many numbers do you want to enter? 4 Number 1: 5

Number 2: 11

Number 3: -2

Number 4: 3 Smallest = -2 Largest = 11

27. Given an array: 83, 10, -5, -8, 20 ,7

a. Write a program that will calculate the sum of all items in the array (use a method).
b. Write a program that will sort the elements in the array (using a method)
c. Write a program that will replace the 3rd element with 4, append 5 to the array and reverse sort the array. (using a method)

28. Write a method called season that takes as parameters two integers representing a month and day and returns a String indicating the season for that month and day. Assume that the month is specified as an integer between 1 and 12 (1 for January, 2 for February, and so on) and that the day of the month is a number between 1 and 31. If the date falls between 12/16 and 3/15, the method should return "winter" .
If the date falls between 3/16 and 6/15, the method should return "spring" . If the date falls between 6/16 and 9/15, the method should return "summer" . And if the date falls between 9/16 and 12/15, the method should return "fall" .

29. Write a method called longestName that accepts a Scanner for the console and an integer n as parameters and prompts for n names, then prints the longest name (the name that contains the most characters) in the format shown below, names,

which might result from a call of longestName(console, 4) :

name #1? Roy

name #2? DANE

name #3? sTeFaNiE

name #4? Mariana Stefanie's name is longest

30. Write a method called wordCount that accepts a String as its parameter and returns the number of words in the String. A word is a sequence of one or more nonspace characters (any character other than ' '). For example, the call wordCount("hello ") should return 1, , the call wordCount("how are you? ") should return 3 , the call wordCount(" this string has wide spaces ") should return 5 , and the call wordCount(" ") should return 0