

Problem Set - Rubric
CODING EXAM ONE [RUBRICS]
VERSION 1.0

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[2 points]

Problem 1: Reversing the digits

Task	Points
Program compiles successfully	0.15
Re-prompt user until a valid positive integer is provided	0.40
Correctly reverse the digits of the confirmed number	0.50
Correctly identify prime digits in reversed number	0.40
Correctly compute the sum of identified prime digits	0.40
Correctly handle and print "No prime digits found" message when applicable	0.15

[2 points]

Problem 2: Palindrome Checker

Task	Points
Program compiles successfully	0.15
Read string input from the command line	0.25
Correctly normalize text (ignore spaces and punctuation)	0.60
Correctly ignore case sensitivity	0.25
Correctly determine if the normalized string is a palindrome	0.50
Match the required output format for valid/invalid cases	0.25

[2 points]

Problem 3: Finding Armstrong Numbers

Task	Points
Program compiles successfully	0.15
Accept and validate two command-line arguments	0.40
Re-prompt until valid positive integers are provided	0.25
Correctly implement Armstrong logic (digits raised to power of digit count)	0.70
Correctly identify all Armstrong numbers within the specified range	0.35
Output result in the required line-by-line format	0.15

[2 points]

Problem 4: Summing the Digits in a Number

Task	Points
Program compiles successfully	0.15
Accept command-line input and validate format	0.25
Handle corner cases and re-prompt for invalid characters	0.40
Correctly ignore decimal points and commas during summation	0.30
Correctly sum all digits in the provided arbitrary length number	0.40
Correctly find the twin-prime pair closest to the calculated sum	0.50

[2 points]

Problem 5: Sentence Transformer

Task	Points
Program compiles successfully	0.15
Validate single sentence command-line argument and handle missing input	0.25
Correctly strip all punctuation marks	0.40
Correctly reverse each word individually while preserving original word order	0.50
Correctly apply cyclic vowel transformation and preserve case	0.50
Correct output as a single transformed string	0.20

[2 points]

Problem 6: Pangram Checker

Task	Points
Program compiles successfully	0.15
Correctly check whether a given sentence is a perfect pangram	0.60
Correctly check whether a given sentence is a regular pangram	0.50
Correctly check whether a given sentence is not a pangram	0.50
Correct output	0.25

[2 points]

Problem 7: Twin Primes

Task	Points
Program compiles successfully	0.15
Accept input from the command line	0.20
Handle invalid input cases	0.50
Correctly calculate all twin-primes within a range	0.75
Re-prompt user until valid input is provided	0.25
Correct twin-prime output	0.15

[2 points]

Problem 8: Day-of-Year Calculator

Task	Points
Program compiles successfully	0.15
Accept a date string in YYYY-MM-DD format from the command-line	0.20
Correctly validate given input date (year, month, day) including leap year rules	0.75
Correctly compute the corresponding day of the year	0.40
Produce the correct one line output that matches the required format for both valid and invalid cases	0.50

[3 points]

Problem 11: Cash Register at a Toy Shop

Task	Points
Program compiles successfully	0.15
Prompt user and accept two command-line arguments in valid monetary values	0.50
Convert command-line arguments to integer values	0.40
Correctly calculate the change. Handle special case where amount paid is less than the cost	0.50
Correctly break the change down into denominations	0.85
Output the correct total change amount in the required format	0.60

[3 points]

Problem 12: ISBN-10 Validator

Task	Points
Program compiles successfully	0.15
Correctly remove hyphens and spaces from the input	0.35
Check if cleaned input has exactly 10 characters	0.25
Verify characters 0-8 are digits and allow x as a valid check digit	0.25
Restrict x to the final position only	0.25
Detect and reject ISBN with invalid characters	0.25
Compute a weighted sum using decreasing weights	0.50
Correctly apply $\text{sum} \% 11 == 0$ to decide VALID vs. NOT VALID	0.50
Correctly handle all edge cases	0.50

[3 points]

Problem 13: Credit Card Validator (Luhn Check)

Task	Points
Program compiles successfully	0.15
Correctly remove hyphens and spaces from the input	0.35
Check that cleaned length is between 13 and 19 digits	0.25
Validate that all cleaned characters are digits (0-9)	0.25
Correctly apply the Luhn doubling rule	0.50
Correct output	1.00
Correct error handling	0.50

[3 points]

Problem 14: Expression Evaluator

Task	Points
Program compiles successfully	0.15
Correctly remove spaces and handle empty input after cleaning	0.35
Validate allowed characters (0-9, +, -, *)	0.50
Validate expression structure	0.50
Correctly handle operator precedence	0.50
Correct output	0.50
Correct error handling	0.50

[3 points]

Problem 15: Anagram Grouper

Task	Points
Program compiles successfully	0.15
Correctly split input on commas and trim spaces	0.35
Validate word rules	0.50
Compute a correct anagram signature (lowercase + sorted letters)	0.50
Correctly group words by signature	0.50
Correct output	0.50
Correct error handling	0.50

[3 points]

Problem 16: Caesar Cipher (Encrypt or Decrypt)

Task	Points
Program compiles successfully	0.15
Accept exactly 3 arguments from the command-line	0.15
Validate command-line arguments as specified in the assignment	0.80
Correctly normalize shift operation	0.60
Transform the message, correctly handling the rules specified for letters, digits, punctuation, and spaces	1.00
Produce one line output that matches the required format	0.30

[3 points]

Problem 17: Atbash Cipher

Task	Points
Program compiles successfully	0.20
Accept exactly one message argument from the command line	0.20
Validate command-line arguments	0.50
Apply Atbash letter mapping to the user input, correctly handling the rules specified in the assignment	1.20
Print correct output in the specified format	0.90

[3 points]

Problem 18: Prime Factorization Printer

Task	Points
Program compiles successfully	0.15
Accept exactly one user input from the command line	0.15
Validate arguments as specified in the assignment (e.g. missing arguments, numeric rules)	0.90
Correctly compute prime factors using repeated division	1.20
Produce the correct one-line output that matches the required format for both valid and invalid cases	0.60

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