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IMPORT random number generator
IMPORT time tracking functionality

FUNCTION create_question(min_num, max_num):
   SET num1 = random integer between min_num and max_num
   SET num2 = random integer between min_num and max_num
   SET operator = random choice from ['+', '-', '*']
   SET question = string of "num1 operator num2"
   IF operator is '+':
      SET answer = num1 + num2
   ELSE IF operator is '-':
      SET answer = num1 - num2
   ELSE:
      SET answer = num1 * num2
   RETURN question, answer

FUNCTION ask_question(question, correct_answer):
   SET start_time = current time
   TRY:
      PROMPT user for answer to question
      CONVERT user input to integer as user_answer
      SET end_time = current time
      SET response_time = end_time - start_time
      SET is_correct = (user_answer equals correct_answer)
      RETURN is_correct, response_time
   CATCH invalid input error:
      SET end_time = current time
      SET response_time = end_time - start_time
      RETURN False, response_time
 FUNCTION main:
   WHILE True:
      // Welcome and difficulty selection
      DISPLAY "Welcome to Akash's Maths Test!"
      DISPLAY "Choose a difficulty: Easy (1/e/easy), Medium (2/m/medium), Hard
(3/h/hard), Custom (4/c/custom)"

// Get valid difficulty choice
      WHILE True:
         PROMPT user for difficulty choice
         CONVERT choice to lowercase
         IF choice is '1' or 'e' or 'easy':
            SET difficulty = "Easy"
            SET questions = 5
            SET max_num = 10
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            BREAK
        ELSE IF choice is '2' or 'm' or 'medium':
            SET difficulty = "Medium"
            SET questions = 10
            SET max_num = 20
            BREAK
        ELSE IF choice is '3' or 'h' or 'hard':
            SET difficulty = "Hard"
            SET questions = 15
            SET max_num = 50
            BREAK
        ELSE IF choice is '4' or 'c' or 'custom':
            SET difficulty = "Custom"
            WHILE True:
                TRY:
                    PROMPT user for number of questions
                    CONVERT input to integer as questions
                    IF questions < 1:
                        DISPLAY "Error: Number of questions must be at least 1."
                        CONTINUE
                    PROMPT user for maximum number
                    CONVERT input to integer as max_num
                    IF max_num < 2:
                        DISPLAY "Error: Maximum number must be at least 2."
                        CONTINUE
                    BREAK
                CATCH invalid input error:
                    DISPLAY "Error: Please enter valid numbers."
            BREAK
        ELSE:
            DISPLAY "Invalid choice. Please select Easy, Medium, Hard, or Custom."

    DISPLAY "You have selected difficulty difficulty."
// Initialize variables
    SET score = 0
    INITIALIZE empty lists: correctness, response_times, questions_asked

    // Loop for questions
    FOR i from 0 to questions - 1:
        DISPLAY "Score: score"
        DISPLAY "Question i+1 of questions"

        IF i equals questions - 1:
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            DISPLAY "Challenge question!"
            SET min_num = max_num
            SET question_max_num = max_num * 2
        ELSE:
            SET min_num = max_num / 2 (integer division)
            SET question_max_num = max_num

        SET question, correct_answer = create_question(min_num,
question_max_num)
        APPEND question to questions_asked

        SET is_correct, response_time = ask_question(question, correct_answer)
        APPEND is_correct to correctness
        APPEND response_time to response_times

 SET points = 0
        IF is_correct:
            IF i equals questions - 1:
                SET base_points = 20
            ELSE:
                SET base_points = 10
            SET points = maximum of 1 and (base_points - integer part of
response_time)
            INCREMENT score by points
            IF points equals 1:
                SET point_str = "point"
            ELSE:
                SET point_str = "points"
            IF integer part of response_time equals 1:
                SET second_str = "second"
            ELSE:
                SET second_str = "seconds"
            DISPLAY "Correct! You took response_time (1 decimal place) second_str and
earned points point_str."
        ELSE:
            IF integer part of response_time equals 1:
                SET second_str = "second"
            ELSE:
                SET second_str = "seconds"
            DISPLAY "Incorrect. You took response_time (1 decimal place) second_str
and earned 0 points."

// Display final results
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    SET correct_count = sum of correctness list
    IF questions > 0:
        SET percentage_correct = (correct_count / questions) * 100
    ELSE:
        SET percentage_correct = 0
    IF response_times is not empty:
        SET avg_response_time = sum of response_times / length of response_times
    ELSE:
        SET avg_response_time = 0

    DISPLAY "=== Test Results ==="
    DISPLAY "Final Score: score"
    DISPLAY "Correct Answers: correct_count/questions (percentage_correct to 1
decimal place%)"
    DISPLAY "Average Response Time: avg_response_time to 1 decimal place
seconds"

    // Question-by-question breakdown
    DISPLAY "=== Question Breakdown ==="
    FOR i from 0 to questions - 1:
        IF correctness[i] is True:
            SET status = "Correct"
        ELSE:
            SET status = "Incorrect"
        IF integer part of response_times[i] equals 1:
            SET second_str = "second"
        ELSE:
            SET second_str = "seconds"
        DISPLAY "Question i+1: questions_asked[i] - status (response_times[i] to 1
decimal place second_str)"

    // Ask to restart
    PROMPT user for restart choice
    CONVERT restart choice to lowercase
    IF restart is 'y' or 'yes':
        CONTINUE
    ELSE:
        DISPLAY "Thank you for playing Akash's Maths Test!"
        BREAK

CALL main
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