CASE STUDY - TIMED MATH QUIZ

SANJANA DASARI - 2023000377
AKSHAYA - 2023000420
CHANDANALATHA - 20230000427
KUSUMA SREE - 2023000443

ABSTRACT :

This Python script presents a math quiz game with 10 levels, each containing 5 progressively challenging questions. Users must answer questions within each level, with scores and completion times displayed afterward. If an answer is incorrect, the game ends. Upon completing all levels successfully, users receive congratulations and appreciation.

CODE :

```python
import random
import time


# Function to generate a math question based on the given level
def generate_question(level):
    # Define the range for numbers based on the level
    if level <= 3:
        num1 = random.randint(1, 10)
        num2 = random.randint(1, 10)
    elif level <= 6:
        num1 = random.randint(10, 50)
        num2 = random.randint(10, 50)
    else:
        num1 = random.randint(50, 100)
        num2 = random.randint(50, 100)

    # Choose a random operator
```

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    operator = random.choice(['+', '-', '*', '/'])

    # Ensure that division questions have integer solutions
    if operator == '/':
        num1 = num1 * num2

    # Construct the question string
    question = f"What is {num1} {operator} {num2}? "
    return question, eval(str(num1) + operator + str(num2))

# Main function to run the math quiz
def main():
    print("Welcome to the Math Quiz!")
    total_score = 0

    # Loop through 10 levels
    for level in range(1, 11):
        print(f"\nLevel {level}:")
        print("Answer the following questions:")

        # List to store questions and answers to avoid repetition within a level
        questions_answers = []
        level_score = 0

        # Start the timer
        start_time = time.time()

        # Generate 5 unique questions for each level
        for _ in range(5):
            # Generate a unique question
            question, answer = generate_question(level)
            while question in questions_answers:
                question, answer = generate_question(level)

            print(question)
            user_answer = input("Your answer: ")
```

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        try:
            user_answer = float(user_answer)
            if user_answer == answer:
                level_score += 1
            else:
                # If the answer is incorrect, end the game
                print("Incorrect! You lost.")
                return
        except ValueError:
            print("Invalid input! Please enter a number.")

        # Add question to the list to avoid repetition
        questions_answers.append(question)

    # End the timer
    end_time = time.time()

    # Calculate the time taken for the level
    level_time = end_time - start_time

    # Display the score and time taken for the level
    print(f"Score for Level {level}: {level_score}/5")
    print(f"Time taken for Level {level}: {level_time:.2f} seconds")

    # Display feedback message after completing each level
    print(random.choice(["Bravo!!", "Smart!!", "Great!!", "Well done!!",
"Fantastic!!"]))

    # Add the level score to the total score
    total_score += level_score

    # Display final message if the game is completed without errors
    print("\nCongratulations on completing the game! Well done!")

if __name__ == "__main__":
    main()
```

OUTPUT

```
Welcome to the Math Quiz!

Level 1:
Answer the following questions:
What is 28 / 4?
Your answer: 7
What is 3 * 2?
Your answer: 6
What is 3 + 2?
Your answer: 5
What is 1 + 6?
Your answer: 7
What is 3 * 7?
Your answer: 21
Score for Level 1: 5/5
Time taken for Level 1: 8.83 seconds
Great!!
```

```
Level 2:
Answer the following questions:
What is 7 - 5?
Your answer: 2
What is 2 + 3?
Your answer: 5
What is 4 - 9?
Your answer: -5
What is 5 / 1?
Your answer: 5
What is 7 - 6?
Your answer: 1
Score for Level 2: 5/5
Time taken for Level 2: 10.61 seconds
Well done!!
```

```
Level 3:
Answer the following questions:
What is 36 / 6?
Your answer: 6
What is 3 * 9?
Your answer: 27
What is 6 - 2?
Your answer: 4
What is 9 * 9?
Your answer: 81
What is 7 - 3?
Your answer: 4
Score for Level 3: 5/5
Time taken for Level 3: 9.88 seconds
Smart!!
```

```
Level 4:
Answer the following questions:
What is 34 - 46?
Your answer: -12
What is 24 + 48?
Your answer: 72
What is 40 + 15?
Your answer: 55
What is 18 * 16?
Your answer: 288
What is 896 / 28?
Your answer: 32
Score for Level 4: 5/5
Time taken for Level 4: 30.30 seconds
Well done!!
```

```
Level 5:
Answer the following questions:
What is 45 * 12?
Your answer: 540
What is 444 / 37?
Your answer: 12
What is 512 / 16?
Your answer: 32
What is 22 + 41?
Your answer: 63
What is 660 / 33?
Your answer: 20
Score for Level 5: 5/5
Time taken for Level 5: 33.71 seconds
Well done!!
```

```
Level 6:
Answer the following questions:
What is 14 * 13?
Your answer: 182
What is 990 / 22?
Your answer: 45
What is 740 / 37?
Your answer: 20
What is 260 / 13?
Your answer: 20
What is 14 - 26?
Your answer: -12
Score for Level 6: 5/5
Time taken for Level 6: 36.96 seconds
Fantastic!!
```

```
Level 7:
Answer the following questions:
What is 3564 / 66?
Your answer: 54
What is 89 * 59?
Your answer: 5251
What is 7280 / 91?
Your answer: 80
What is 68 - 83?
Your answer: -15
What is 91 + 86?
Your answer: 177
Score for Level 7: 5/5
Time taken for Level 7: 46.49 seconds
Smart!!
```

```
Level 8:
Answer the following questions:
What is 74 + 56?
Your answer: 130
What is 9312 / 97?
Your answer: 96
What is 3978 / 78?
Your answer: 51
What is 96 * 82?
Your answer: 7872
What is 55 - 77?
Your answer: -22
Score for Level 8: 5/5
Time taken for Level 8: 35.06 seconds
Great!!
```

```
Level 9:
Answer the following questions:
What is 89 - 64?
Your answer: 25
What is 4680 / 52?
Your answer: 90
What is 78 - 57?
Your answer: 21
What is 5643 / 99?
Your answer: 57
What is 87 * 98?
Your answer: 8526
Score for Level 9: 5/5
Time taken for Level 9: 37.65 seconds
Fantastic!!
```

```
Level 10:
Answer the following questions:
What is 69 + 93?
Your answer: 162
What is 89 + 81?
Your answer: 170
What is 64 + 73?
Your answer: 137
What is 4355 / 65?
Your answer: 67
What is 97 * 85?
Your answer: 8245
Score for Level 10: 5/5
Time taken for Level 10: 37.17 seconds
Great!!

Congratulations on completing the game! Well done!
```

If incorrect the game stops

```
Level 1:
Answer the following questions:
What is 6 + 6?
Your answer: 12
What is 2 * 6?
Your answer: 12
What is 35 / 7?
Your answer: 5
What is 5 - 5?
Your answer: 1
Incorrect! You lost.
```