Assignment 3

Instructions:

- Solve the tasks below using Dart programming.
- Save your code in a file named `dart_loops_assignment.dart`.
- Add comments to explain your logic.

Task 1: Multiplication Table Generator

1. Write a program to generate the multiplication table for a given number (e.g., `5`).

   Use a `for` loop to print the table in the format:
   5 x 1 = 5
   5 x 2 = 10
   ...
   5 x 10 = 50

Task 2: Sum of Natural Numbers

1. Write a program to calculate the sum of the first `n` natural numbers (e.g., if `n = 5`, sum = 1 + 2 + 3 + 4 + 5 = 15).
2. Use a `while` loop.
3. Print the sum in the format: "The sum of the first 5 natural numbers is 15."

Task 3: FizzBuzz Game

1. Write a program to print numbers from 1 to 50 with the following rules: ○
   If the number is divisible by 3, print "Fizz" instead of the number.
   ○ If the number is divisible by 5, print "Buzz" instead of the number.
   ○ If the number is divisible by both 3 and 5, print "FizzBuzz" instead of the number.
2. Use a `for` loop.

Task 4: Grade Calculation with Loops

1. Declare a list of marks for 5 students: `[95, 76, 58, 89, 66]`. 2. Use a `for` loop to determine and print the grade for each student based on the following criteria:

- Marks >= 90: Grade A
- Marks >= 80: Grade B
- Marks >= 70: Grade C
- Marks >= 60: Grade D
- Marks < 60: Fail

Output format:
Student 1: Marks = 95, Grade = A
Student 2: Marks = 76, Grade = C
…

Task 5: Number Pattern

Use nested `for` loops to print the following pattern:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

Task 6: Prime Number Checker

1. Write a program to check if a given number is a prime number or not.
2. Use a `for` loop to iterate through potential divisors.
3. If the number is divisible by any number other than 1 and itself, print: "Not a prime number."
4. Otherwise, print: "Prime number."

Task 7: Understanding `continue`

1. Write a program that prints all numbers from 1 to 10, except the number `5`.
2. Use a `for` loop and the `continue` keyword.

Task 8: Using `break`

1. Write a program to find the first number greater than `100` that is divisible by both `3` and `7`.
2. Use a `while` loop and the `break` keyword to exit the loop once the number is found. 3. Print the number with a message: "The first number greater than 100 divisible by 3 and 7 is `number`."

Bonus Task (Optional): Nested Loop Challenge

Write a program to generate the following pattern using nested `for` loops: * * * * *

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* * *

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Submission Guidelines:

- Ensure your code is clean and tested.
- Add comments to describe your logic for each task.
- Submit the completed assignment by the deadline.