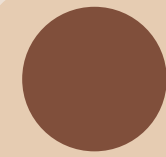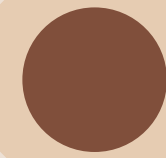# Topic 1.7: Loops

Learning Goals (Week 1):

- Identify data types based on value
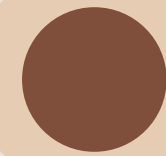
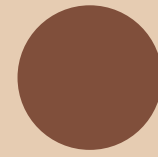- Map variables to the current values
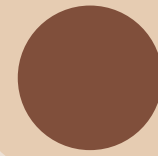
- Perform basic operations on variables

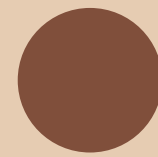- Create and use Java and user-defined methods

- Format Printed Output

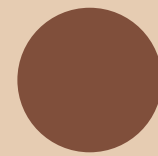- Obtain and process user input from the console

- Use booleans, conditionals, and compound conditionals correctly

- **Select and implement different types of loops depending on scenario**

- Use special String and Math operations

- Successfully implement and manipulate java arrays

How do we get user input?

- Three different types of loops that you can use:
  - **For** Loop
  - **While** Loop
  - **Do While** Loop
- All 3 can produce the same result but in most cases, there is a specific type of loop that is more appropriate for the task
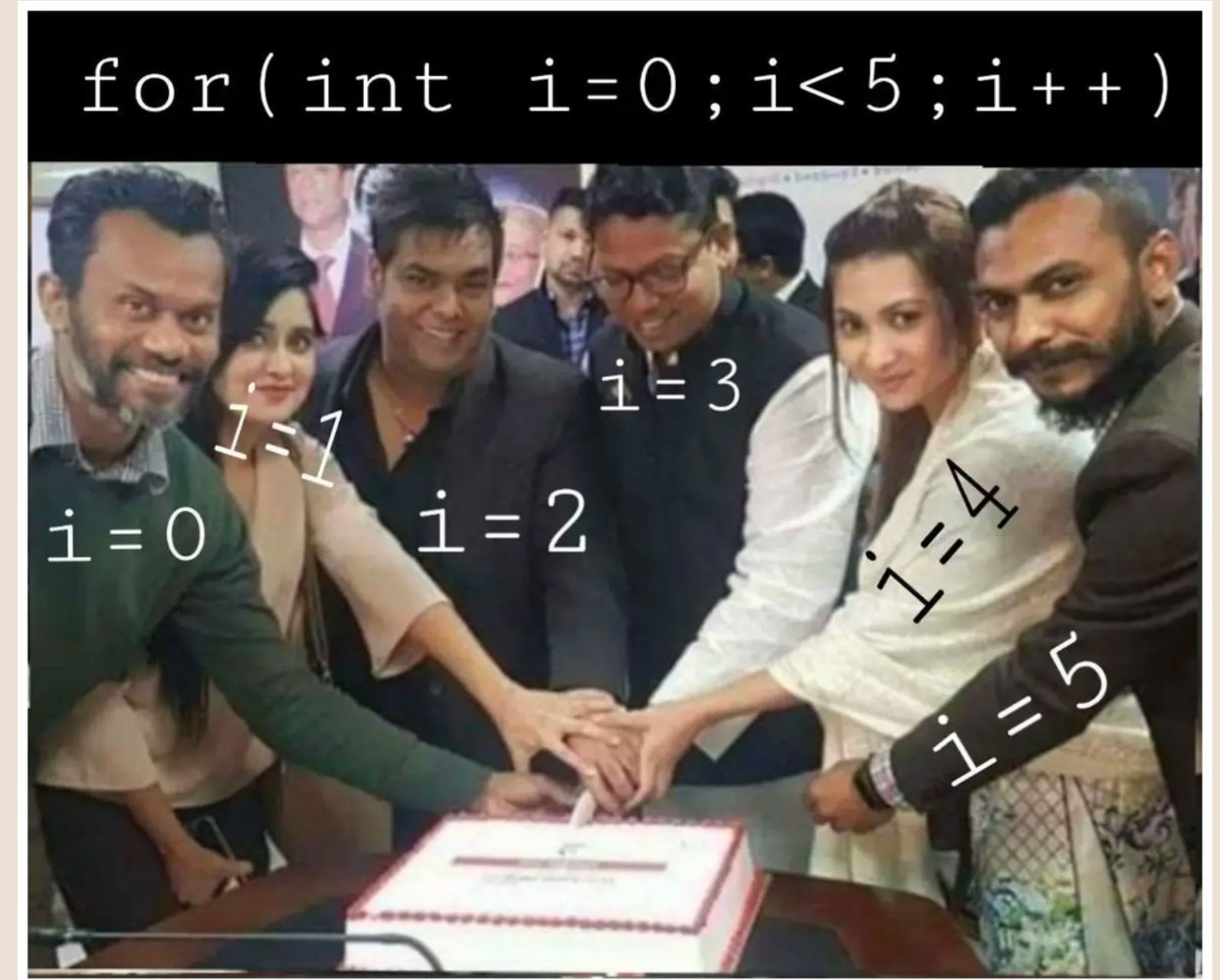

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For Loop

- The most common loop: the for loop

```
for(int i = 0; i < 5; i++) {
        System.out.println("I will" +
            " help cut the cake");
}
```

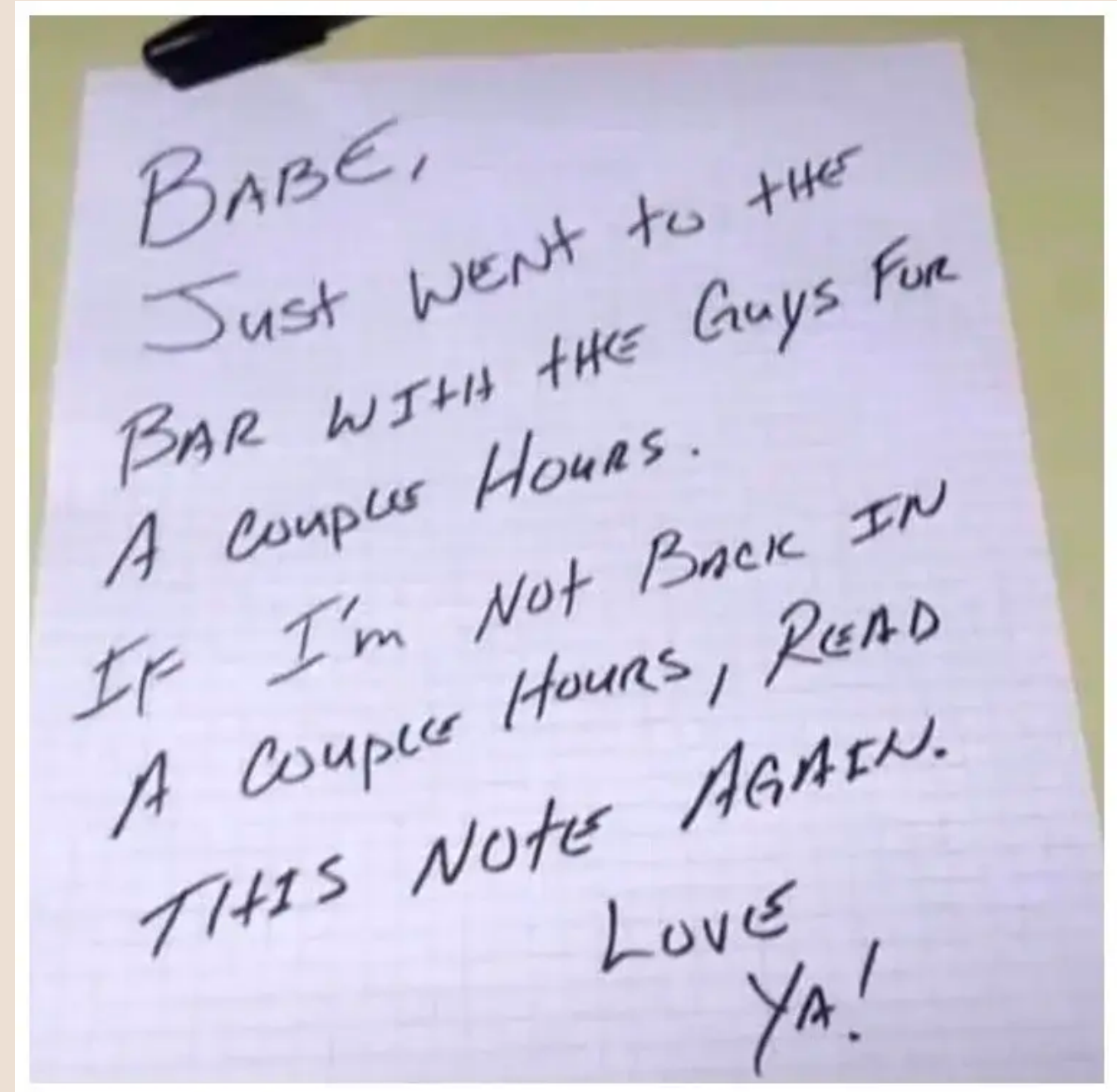- Up to but not including end number

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While Loop

- Only require a boolean expression inside parentheses

```
int counter = 0;
while(count < 5) {
    System.out.println("Step: " + counter);
    counter++;
}
```


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Do While Loop

- Similar to a while loop, except that it executes the block first, and then checks the boolean expression to guarantee at least 1 execution of block

```
int counter = 0;

do {
    System.out.println(counter);
    counter++;
}
while ( counter <= 10 );
```


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Special Keywords

- **break;** -> immediately terminates the inner loop
- **continue;** -> immediately skips to the next iteration of the loop
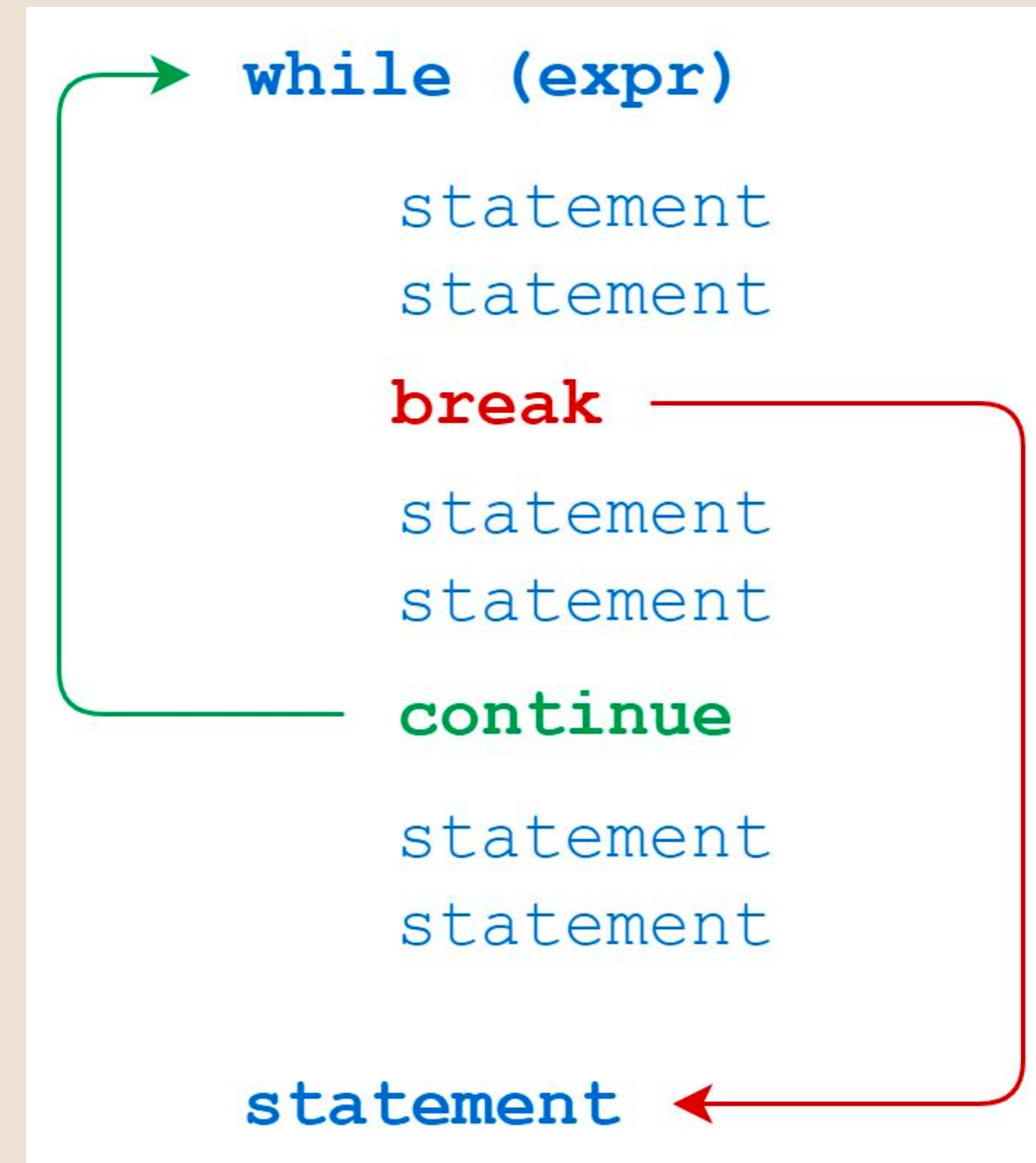
Ahmed Fawzy

NOTE: These are shown for informational purposes only. Programming standards in COMP 1020 do not permit the use of break or continue.

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Pause & Practice

1. For Loop Question:
   a. Task: Write a Java program using a for loop to print the first 10 multiples of a given number. For example, if the number is 3, your program should print 3, 6, 9, ..., 30.
2. While Loop Question:
   a. Task: Write a Java program using a while loop that reads integers from the user until they enter 0. After the user enters 0, print the sum of all entered numbers. Assume the user enters valid integers only.
3. Do-While Loop Question:
   a. Task: Write a Java program using a do-while loop that repeatedly asks the user to enter a number. The program should add 1 to the number and print the result. The program should stop when the user enters a number greater than 100.

"Programming Practice Questions on Loop Structures in Java." ChatGPT, OpenAI. Accessed [December 2023]