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| **Department of Software Engineering**  **Mehran University of Engineering and Technology, Jamshoro** |

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| **Course: SWE121 – Object Oriented Programming** | | | |
| **Instructor** | Mr. Asmatullah | **Practical/Lab No.** | 03 |
| **Date** | 23-05-2022 | **CLOs** | CLO-3 |
| **Signature** |  | **Assessment Score** | 1 Marks |

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| **Topic** | **Working with iterative structures** |
| **Objectives** | * To understand Control Structures (Iterative statements/Loops) such as for, while, and do-while loop. * Write code using all forms of iterative loops such as ***while*** and ***do…while*** and ***for*** loops, including the labeled and unlabeled use of the break and continue. |

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| **Lab Discussion: Theoretical concepts and Procedural steps** |

**Tools:**  Java Development Kit, Text Pad

**Theory**

Outlines

* Describe various types of loops and their syntax/format.
* Learn how to write Java programs that use loops (for, while, do-while )
* Use Iterative control structures to alter the normal sequence of programs.
* **Describe various types of loops and their syntax/format.**

Iteration means doing the same thing again and again. The principal method of iteration is the loop.

**while Loop**

A while loop causes your program to repeat a sequence of statements as long as the starting condition remains true.

The syntax for the while statement is as follows:

while ( condition )

statement;

*condition* is any JAVA expression, and *statement* is any valid JAVA statement or block of statements. When *condition* evaluates true, *statement* is executed, and then *condition* is tested again. This continues until *condition* tests false, at which time the while loop terminates and execution continues on the first line below *statement*.

**Example**

// count to 10

int x = 0;

while (x < 10)

System.out.println( “X: “ +x++);

**do...while Loop**

The do...while loop executes the body of the loop before its condition is tested, thus ensuring that the body always executes at least one time.

The syntax for the do...while statement is as follows:

do

statement

while (condition);

*statement* is executed, and then *condition* is evaluated. If *condition* is true, the loop is repeated; otherwise, the loop ends. The statements and conditions are otherwise identical to the while loop.

**Example**

// count to 10

int x = 0;

do

System.out.println( “X: “ + x++);

while (x < 10);

**for Loop**

When programming while loops, you’ll often find yourself going through three steps:

setting up a starting condition, testing to see whether the condition is true, and incrementing or otherwise changing a variable each time through the loop.

A for loop combines the three steps into one statement. The three steps are initializing, testing, and incrementing. A for statement consists of the keyword for followed by a pair of parentheses. Within the parentheses are three statements separated by semicolons:

for( initialization; test ; action )

statement;

The *initialization* statement is used to initialize the state of a counter, or to otherwise prepare for the loop. *test* is any JAVA expression and is evaluated each time through the loop. If *test* is true, the body of the for loop is executed and then the action in the header is executed (typically the counter is incremented).

**Example 1**

// print Hello ten times

for (int i = 0; i<10; i++)

System.out.println( “Hello! “);

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| **Lab Tasks** |

1. Generate a series of Odd number and even number using for and while loop.(0.2)
2. Generate all ACSII codes (0-255) using loops in java.(0.2)
3. Write a java program that takes the table, starting and ending point of the table and prints the output in the following way: (0.3)

Enter Starting point: 3

Enter Ending point: 5

Enter Table No: 5

5x3 = 15

5x4 = 20

5x5 = 25

1. Generate diamond structure in java.