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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.** | 04 |
| **Date** | 30-05-2021 | **CLOs** | CLO-3 |
| **Signature** |  | **Assessment Score** | 1 Marks |

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| **Topic** | **Working with conditional structures** |
| **Objectives** | * To know how to compare the given data values. * How to define the logical expressions to alter the sequence of program. * To write code using ***if*** and ***switch*** statements and identify the legal argument types for these statements. |

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

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

**Theory**

Outline

* Explaining what is control structure and various types of control structures
* Describe conditional control structures such Conditional IF Block, and Switch Selection Block, along with their basic syntax.
* Describe what Boolean expressions is and how to form Boolean expression to compare values.

**Control structures:**

* The execution of the program is linear.
* Control Structures are used to alter/change the flow of program.
* Controls which statement(s) should be executed next.

Controls structures are mainly divided into two parts,

1. Selection/Branching/Conditional
2. Loops/Iterative

**Conditional Control structures:**

Branching statements alter sequential execution of program statements.

There are three conditional statements supported by JAVA

1. **If**
2. **If…else**
3. **switch**

Execute code based on a condition(s).

**if Statement:** Performs an action if a condition is true or skips the action if the condition is false.If statement is a single selection statement

**If…else Statement:** Performs an action if the condition is true and performs a different action if the condition is false.If-else statement is a double selection statement

**Switch Statement:** is a multiple selection statement, performs one of different actions.

**Loops Control structures:**

cause a section of your code to repeated a certain number of times,

There are three types of loops statement

1. **for**
2. **while**
3. **do…while**

**for Loop:** Executes a section of your program a fixed number of times.

**while Loop:** A while statement repeats an action again and again as long as a controlling Boolean expression is true.

**do...While Loop:** The body of a do-while loop is always executed at least once, no matter what the initial state of test expression.

* **Describe conditional control structures such Conditional IF Block, and Switch Selection Block, along with their basic syntax.**

**if Statement:**

Normally, your program flows along line-by-line in the order in which it appears in your source code. The if statement enables you to test for a condition (such as whether two variables are equal) and branch to different parts of your code, depending on the result. The simplest form of an if statement is the following:

if (expression)

statement;

The expression in the parentheses can be any expression, but it usually contains one of the relational expressions. If the expression has the value false, the statement is skipped. If it evaluates true, the statement is executed. Consider the following example:

if (bigNumber > smallNumber)

bigNumber = smallNumber;

This code compares bigNumber and smallNumber. If bigNumber is larger, the second line sets its value to the value of smallNumber. If bigNumber is not larger than smallNumber, the statement is skipped.

Because a block of statements surrounded by braces is equivalent to a single statement, the branch can be quite large and powerful:

if (expression)

{

statement1;

statement2;

statement3;

}

Here’s a simple example of this usage:

if (bigNumber > smallNumber)

{

bigNumber = smallNumber;

std::cout << “bigNumber: “ << bigNumber << “\n”;

std::cout << “smallNumber: “ << smallNumber << “\n”;

}

This time, if bigNumber is larger than smallNumber, not only is it set to the value of smallNumber, but an informational message is printed.

**switch Statement:**

If you have a large decision tree, and all the decisions depend on the value of the same variable,

you will probably want to consider a switch statement instead of a ladder of if...else

or else if constructions.

Before entering the switch, the program should assign a value to the switch variable. This

value will usually match a constant in one of the case statements. When this is the case (pun

intended!), the statements immediately following the keyword case will be executed, until a

break is reached.

The syntax for the switch statement is as follows:

switch (expression)

{

case valueOne: statement;

case valueTwo: statement;

....

case valueN: statement;

default: statement; }

The switch statement allows for branching on multiple values of expression. The expression

is evaluated, and if it matches any of the case values, execution jumps to that line.

Execution continues until either the end of the switch statement or a break statement is

encountered.

If expression does not match any of the case statements, and if there is a default statement,

execution switches to the default statement, otherwise the switch statement

ends.

**Example:**

switch (choice)

{

case 0:

cout << “Zero!” << endl;

break;

case 1:

cout << “One!” << endl;

break;

case 2:

cout << “Two!” << endl;

default:

cout << “Default!” << endl;

}

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| **Lab Tasks** |

1. Write a java program that takes a single character as input and tells whether it is a vowel or a consonant. (Use Switch Statement).
2. Write a java program that performs arithmetic operations on two numbers after taking 3 runtime arguments; 1st number, 2nd number and the operators (+, -, /, \*) and prints the result.
3. Write a java program which check whether a number is prime or not.
4. Write a java program that takes five subjects marks of a student and calculate their percentage and grade.