**Chapter 5 Conditional Control Structures**

**Read Pgs 105 – 121 Complete**

* Critical Thinking Pg 122 # 1, 5, 6
* Exercise # 2,3,5, 6, 9b, 11, 13, 16

**Relational Operators Meaning**

= = Equal to

< Less than

> Greater than

<= Less than or equal

>= Greater than or equal

!= Not equal

**Logical Operators**

&& (And) - both expressions must evaluate to true for the entire expression to be true.

| | (OR) - one expression must evaluate to true for the entire expression to be true.

! (Not) - reverses the truth or falsity of an expression.

**if statement format:**

if (condition) {

Statements

}

**Example:**

if (intNum = = 5 )

{

System.out.println(“The number is 5”) ;

}

**The if-else statement format:**

if (condition) {

statements

}

else {

statements

}

**Example:**

if (intNum != 5) {

System.out.println(“The number is not equal to 5”);

}

else {

System.out.println(“The number is equal to 5”);

}

**The if-else-if statement format:**

if (condition) {

statements

}

else if (condition){

statements

}

else {

Statements

}

**Example:**

if (intNum >=100) {

System.out.println(“The number is greater than 100”);

}

else if (intNum>= 10){

System.out.println(“The number is between 10 and 100”);

}

else {

System.out.println(“The number is less than 10”);

}

**Example:**

if (intNum = = 2 || intNum = = 4 || intNum = = 6) {

System.out.println(“The number is 2,4 or 6”);

}

If (intNum>=5 && intNum <=10) {

System.out.println(“The number is between 5 and 10”);

}

If ( !(intNum>=10)) {

System.out.println(“The number is less than 10”);

}

**The switch statement**

Similar to Select Case in visual basic. An alternative conditional control structure to the if statement.

**Format:**

switch (expression) {

case x:

statements;

break;

default:

statements;

break;

}

**Example:**

Switch (intNum) {

case 5:

System.out.println(“The number is 5”);

break;

case 10:

System.out.println(“The number is 10”);

break;

case 15:

case 16:

System.out.println(“The number is 15 or 16”);

break;

}

**Generating Random Numbers**

**Method #1**

To generate a random number in a range the following formula is used:

(upper – lower +1) \* Math.random() + lower

**Example:**

public class RandomNumbers {

public static void main(String[] args) {

int intLower, intUpper, intNum1,intNum2;

intLower = 5;

intUpper = 20;

intNum1 = (int) ((intUpper - intLower +1) \* Math.random() + intLower);

intNum2 = (int) ((intUpper - intLower +1) \* Math.random() + intLower);

System.out.println("The two Random numbers between 5 and 20 are: " + intNum1 + " and " + intNum2);

}

}

**Method #2**

package randomenumbers2;

import java.util.Random;

public class RandomeNumbers2 {

public static void main(String[] args) {

Random r = new Random();

int number =r.nextInt(4)+1; //generates between 1 and 4

//r.nextInt(upper-lower+1) + lower

// used when the lower limit is other than 1 or 0

//when lower limit is 0, it does not include the upper

// int number =r.nextInt(4) - would range from 0 to 3

System.out.println(number);

}

}

**The Math Class**

Java Includes the java.lang.Math class for performing math functions such as exponentiation and square root.

**Example:**

import java.lang.Math;

public class MathExamples {

public static void main(String[] args) {

double Num1 = 9 ,Num2 = 4, Num3 = -5, Ans;

Ans = Math.sqrt(Num1);

System.out.println("The Square root of 9 is " + Ans);

Ans = Math.pow(Num2,2);

System.out.println("The square of 4 is " + Ans);

Ans = Math.abs(Num3);

System.out.println("The absolute value of -5 is " + Ans);

}

}

**Rounding Numbers**

double number = 12.5652223;

System.out.format("%.1f\n",number);

//Rounding using Math.round

number = Math.round(number\*10)/10.0; //Math.round - rounds to nearest Integer

System.out.println(number);

**Ternary Operator**

//Syntax

//result = (testCondition) ? value1 if true : value2 if false

Scanner input = new Scanner(System.in);

System.out.println("Enter a number between 1 and 99");

int number = input.nextInt();

System.out.println((number<9)?"One Digit number":"Two digit number");

//-------------------------------------------------------------------

int result=(number>=50 && number<=100)?1:0;

if(result==1)System.out.println("Passing Grade");

else System.out.println("Failing grade");