South Louisiana Community College
ASDV 1220, Programming Fundamentals

PARTNERS WILL BE reassigned today verbally by your Instructor! Use one computer together with your partner. Alternate the roles of Coder, Navigator.

Learning Objectives

After completion of this lab, you should be able to

1. Understand the switch statement
2. The conditional operator
3. The relationship between if-else-if and switch
4. The relationship between if-else and the conditional operator
4. Use those constructions to perfection

Create project Lab8

Problem 1

Create a class **Switch1**, write the code as shown below and run it multiple times. We switch on variable **year** % 12 which is of type integer. This construct is equivalent to if-else-if-else-if........else. Run it multiple times and understand how the switch-statement SWICTHES.

```java
1   package lab9;
2
3   import java.util.Scanner;
4
5   public class Switch1
6   {
7      public static void main(String[] args)
8      {
9        Scanner input = new Scanner(System.in);
10
11         System.out.print("Enter a year to tell you a Chinese joke: ");
12         int year = input.nextInt();
13
14         switch (year % 12)
15           {
16           case 0: System.out.println("monkey"); break;
17           case 1: System.out.println("rooster"); break;
18           case 2: System.out.println("dog"); break;
19           case 3: System.out.println("pig"); break;
20           case 4: System.out.println("rat"); break;
21           case 5: System.out.println("ox"); break;
22           case 6: System.out.println("tiger"); break;
23           case 7: System.out.println("rabbit"); break;
24           case 8: System.out.println("dragon"); break;
25           case 9: System.out.println("snake"); break;
26           case 10: System.out.println("horse"); break;
27           case 11: System.out.println("sheep"); break;
28           }
29      }
```

Problem 2

    Create a class called **Switch1ConvertedToIfElse.** Write the code to have identical results with Problem1 (Switch1) by using the if-else if ….. else statements instead of the switch.

Problem 3

Create a class **Switch2.** Use a switch-statement to rewrite the following **if-else-if** statement.

```
int x = 1, a = 3;
if (a == 1)
        x += 5;
else if (a == 2)
        x += 10;
else if (a == 3)
        x += 16;
else if (a == 4)
        x += 34;
```

Problem 4

Create a class **Switch3.** Write code for the following: Ask the user to enter a number 1 to 7 to signify the 7 days of the week with 1 being Sunday. Use a switch statement that assigns a String variable dayName with Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, if day is 1 , 2 , 3 , 4 , 5 ,6 , 7 accordingly. The program prints the number the user entered along with the correct day of the week.

Problem 5

Create a class **Switch4.** Write code for the following: Ask the user to enter text Sunday to Saturday. Use a switch statement that assigns an int-variable dayNumber with 1, 2, 3, 4, 5, 6 ,7 for Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, respectively. The program prints the day the user entered along with the correct number of the week.

Problem 6

    Create a class called **Switch2ConvertedToIfElse.** Write the code to have identical results to Problem4 (Switch3) by using the if-else if ….. else statements instead.

Problem 7

    Create a class called **ConditionalOperator1**. Write the code as shown below and run it multiple times. Observe **line 18** which prints either "yes sir" or "no sir" . Know that, the conditional operator (in line 18) resembles a SIMPLE IF-ELSE.

```java
 1    package lab8;
 2    import java.util.Scanner;
 3
 4    public class ConditionalOperator1
 5    {
 6       public static void main(String[] args)
 7       {
 8          Scanner scan = new Scanner( System.in);
 9
10          System.out.print( "please enter an even number ");
11          int number = scan.nextInt();
12          if ( number % 2 == 0  )
13              System.out.print("\n" + number + " fulfills the request!");
14          else
15            System.out.print("\n" + number + " does not fulfill the request!");
16
17
18          System.out.println( number % 2 == 0 ? " yes sir!"  : " no sir");
19       }
20    }
```

Problem 8

Create a class **ConditionalOperator2**. Embed into your class the code below and run it. Understand how the conditional operator works: Evaluates the expression first, and if the condition is true, then it RETURNS what follows the "**?**", else it RETURNS what follows the ":"

```java
java.util.Scanner input = new java.util.Scanner(System.in);
double x = input.nextDouble();
double y = input.nextDouble();
double z = input.nextDouble();
System.out.println((x < y && y < z) ? "sorted" : "not sorted");
```

Problem 9

Create a class **ConditionalOperator3**. Embed in your class the code below and run it. The only difference of this problem with Problem 8 is that in this problem the conditional operator RETURNS a number instead of text. Soooooo, **the return-type of the conditional operator can be of ANY TYPE.**

```java
java.util.Scanner input = new java.util.Scanner(System.in);
double x = input.nextDouble();
double y = input.nextDouble();
double z = input.nextDouble();
System.out.println((x < y && y < z) ? 100 : 200);
```

Problem 10

Create a class called **ConditionalOperator4.** Use the code of Problem 7 (ConditionalOperator1) and inverse its code. That is, use the conditional operator to replace the if-else ("fulfills", " does not fulfill"). Then, use and if-else to replace the conditional operator ("yes-sir", "no sir").

Problem 11

Create a class **DecimalToHex1**. Write code for the following: Prompts the user to enter an integer between 0 and 15 and displays its corresponding hex number. Use a **switch** statement. Here are some sample runs:

```
Enter a decimal value (0 to 15): 11
The hex value is B


Enter a decimal value (0 to 15): 5
The hex value is 5

Enter a decimal value (0 to 15): 31
Invalid input
```

Problem 12

Create a class **DecimalToHex2**. Write code for the following: Prompts the user to enter an integer between 0 and 15 and displays its corresponding hex number. Use an **if-else-if** statement.