Lab #3 - LO6 Operators and Decision Structures

Before beginning any of the programs, create a new project and call it Lab3. You will create all of your programs inside this project. Create a single package to contain **all** of your programs, call it Lab3. Be sure to follow ALL instructions regarding creating various objects for each question.

1. Write a program to receive as input an item cost and a boolean tax code. If the tax code is true, the item is subject to a 5% sales tax. If the tax code is false, no tax is due on the item. Output the total cost of the item, including tax if applicable.

- Create a new Java class within the above package - call it Program1
- Add your public static void main method
- Add three variables: itemCost, taxCode and finalCost as float, boolean and float
- Declare your scanner object. Call it myCostInput
- Add a line to import the Scanner class.
- use myCostInput to assign the value of itemCost and taxCode using nextFloat() and nextBoolean(). Be sure to use proper user prompts ie. "Enter the cost of the item: " and "Enter the tax code (true/false): ".
- Determine the final cost, adding in tax if required using a condition which checks if the taxCode is true and if it is, calculate finalCost as itemCost * 1.05, otherwise finalCost just equals itemCost. Remember: you don't need a relational operator with a boolean variable.
- Output a line of text to say what the finalCost is.

2. Write a program to input a user's age. If the age is less than 0 or greater than 120, display an error message, otherwise display a message as follows:

    If the age is less than 13, display the message 'child'
    If the age is between 13 and 17, display the message 'teenager'
    If the age is between 18 and 65, display the message 'adult'
    If the age is greater than 65, display the message 'senior'

- Create a new Java class within the above package - call it Program2
- Add your public static void main method
- Add an int variable age
- Declare your scanner object. Call it myAgeInput
- Add a line to import the Scanner class.
- use myAgeInput to assign the value of age using nextInt()
- set up a multiple IF/ELSE IF structure to check the following conditions and produce the output list beside them

(age < 0 || age > 120) -->> "The age must be between 0 and 120!"
(age < 13) -->> "child"
(age >= 13 && age <= 17) -->> "teenager"
(age >= 18 && age <= 65) -->> "adult"

<default last condition> -->> "senior"

3. Write a program to input a user's name. If the name begins and ends with the same letter, print 'Your name starts and ends with the same letter!', otherwise print 'You have a nice name.'

- Create a new Java class within the above package - call it Program3
- Add your public static void main method
- Add a String variable name
- Declare your scanner object. Call it myNameInput
- Add a line to import the Scanner class.
- use myNameInput to assign the value of name using nextLine(). You may want to add toLowerCase() to your nextLine call
- Determine whether the name begins and ends with the same letter using a basic IF/ELSE, then print the appropriate message.
    - So what is the first character? A: charAt(0)
    - And what is the last character? A: charAt(name.length()-1)
    - So of these two characters are the same, then print the first text otherwise print the second text.
    - Note the comparison here is between char values, not Strings

4. Write a program for a restaurant that, given a day of the week, prints out today's daily special.

- Create a new Java class within the above package - call it Program4
- Before you create your main method, create 7 String constants:

```
MONDAY_SPECIAL = "Lasagna";
TUESDAY_SPECIAL = "Fish and chips";
WEDNESDAY_SPECIAL = "Meat loaf";
THURSDAY_SPECIAL = "Beef dip";
FRIDAY_SPECIAL = "Chicken strips";
SATURDAY_SPECIAL = "Dry ribs";
SUNDAY_SPECIAL = "Turkey";
```

remember we declare these as `public static` and then add the `final` keyword to make them a constant.

- Add your public static void main method
- Add a String variable day
- Declare your scanner object. Call it myDayInput
- Add a line to import the Scanner class.
- use myDayInput to assign the value of day using next(). Remember to provide the user with a suitable prompt.
- Determine and display the daily special using the following logic to build a multiple IF/ELSE structure

day.equals("MONDAY") -->> "Daily special: " + MONDAY_SPECIAL
day.equals("TUESDAY") -->> "Daily special: " + TUESDAY_SPECIAL
day.equals("WEDNESDAY") -->> "Daily special: " + WEDNESDAY_SPECIAL
day.equals("THURSDAY") -->> "Daily special: " + THURSDAY_SPECIAL
day.equals("FRIDAY") -->> "Daily special: " + FRIDAY_SPECIAL
day.equals("SATURDAY") -->> "Daily special: " + SATURDAY_SPECIAL
day.equals("SUNDAY") -->> "Daily special: " + SUNDAY_SPECIAL
default -->> "You entered an invalid day code!"

5. Repeat the last question using switch instead. To do this, you'll need to add some additional things.

- Create a new Java class within the above package - call it Program5
- Before you create your main method, create 7 String constants the same as the previous question.
- Now create and additional 7 int constants as follows:

    MONDAY = 1;
    TUESDAY = 2;
    WEDNESDAY = 3;
    THURSDAY = 4;
    FRIDAY = 5;
    SATURDAY = 6;
    SUNDAY = 7;

- Add an int variable dayNumber
- Declare your scanner object. Call it myDayNumInput
- Add a line to import the Scanner class.
- use myDayNumInput to assign the value of dayNumber using nextInt(). Remember to provide the user with a suitable prompt.

    "Enter a day code as follows:"
    "Monday = " + MONDAY
    "Tuesday = " + TUESDAY
    "Wednesday = " + WEDNESDAY
    "Thursday = " + THURSDAY
    "Friday = " + FRIDAY
    "Saturday = " + SATURDAY
    "Sunday = " + SUNDAY
    "What is today's day code (1-7)? "

-Determine and display the daily special as in the previous question but use a SWITCH() this time. Hint: you can use your constants in place of the actual int values in your case statements to make your code more readable. You can use the same output lines you used above.

6. Write a program that determines ticket prices for a New York Mets games.

- Create a new Java class within the above package - call it Program6
- Before you create your main method, create 7 char constants:
    - Character codes for seating levels
    FIELD = 'f';
    MEZZANINE = 'm';
    UPPER = 'u';
    - Character codes for opponent categories
    PLATINUM = 'p';
    GOLD = 'g';
    SILVER = 's';
    BRONZE = 'b';

    remember we declare these as public static and then add the final keyword to make them a constant.

- Add your public static void main method
- Add three variables: seatingLevel, oppCategory and ticketPrice to store the seating level, opponent category and eventual ticket price.
- Declare your scanner object. Call it myGameInput
- Add a line to import the Scanner class.
- First use myGameInput to assign the value of seatingLevel using nextLine(). Remember to provide the user with a suitable prompt. Also remember that we have to use nextLine().charAt(0)
- Set a condition to validate the seating level to ensure it is one of the above three values. IF it isnt, assign a value of UPPER and display a prompt to the user that this is done. No other conditional outcome is needed here.
- Next use myGameInput to assign the value of oppCategory using nextLine(). Remember to provide the user with a suitable prompt. Also remember that we have to use nextLine().charAt(0)
- Use an IF with nested IF/ELSE IF to evaluate ticket prices as follows:

```
ie.     IF (){
            IF (){

            } ELSE IF (){

            }
            ...
        } ELSE IF (){

        } ELSE {

        }
```

for seatingLevel == FIELD
oppCategory == PLATINUM -->> ticketPrice = 77;
oppCategory == GOLD -->> ticketPrice = 67;
oppCategory == SILVER -->> ticketPrice = 62;
oppCategory must be BRONZE -->> ticketPrice = 57;
for seatingLevel == MEZZANINE
oppCategory == PLATINUM -->> ticketPrice = 54;
oppCategory == GOLD -->> ticketPrice = 48;
oppCategory == SILVER -->> ticketPrice = 45;
oppCategory must be BRONZE -->> ticketPrice = 42;
seating level must be UPPER
oppCategory == PLATINUM -->> ticketPrice = 35;
oppCategory == GOLD -->> ticketPrice = 31;
oppCategory == SILVER -->> ticketPrice = 29;
oppCategory must be BRONZE -->> ticketPrice = 27;

- Display the ticket price

7. Write a program that receives as input an integer, then displays the absolute value of that number.

- Create a new Java class within the above package - call it Program7
- Add your public static void main method
- Add two variables: inputValue, absValue as int variables
- Declare your scanner object. Call it myAbsInput
- Add a line to import the Scanner class.
- use myAbsInput to assign the value of inputValue. Be sure to use proper user prompts.
- Use the conditional operator to calculate the absolute value of the input by checking if it is greater than zero. If it is, simply set absValue to inputValue. If not, set it to 0 - inputValue.
- Remember:
    result = (check condition) ? value if true : value if false;
- Display the number and its absolute value