Unit 3: Conditional Statements

In Unit 3, you learned about the signs of the zodiac and wrote a program to tell your sign. You also learned how to use If…Then statements and conditions.

Objectives:

- Try these additional tasks to further practice what you learned in Unit 3.

1. Given three sides of a triangle,
   a. If the three numbers entered cannot form a triangle, tell the user and Stop the program (Stop is on the Ctl menu).
   b. If the sides do form a triangle tell whether it is acute, right, or obtuse and tell whether it is scalene, isosceles, or equilateral.
2. **Leap Year**? Given a 4-digit year, report whether it is a Leap Year or not. A Leap Year is evenly divisible by 4 unless it is divisible by 100 in which case it is not, unless it is divisible by 400 in which case it is. 1900 is NOT a Leap Year. 2000 is a Leap Year.
3. Ensure that among three variables, **a**, **b**, and **c**, that **c** contains the largest value.
4. Write a program to input a temperature in Celsius and display a suitable message according to temperature state:
   Temp < 0 then Freezing weather
   Temp 0-10 then Very Cold weather
   Temp 10-20 then Cold weather
   Temp 20-30 then Normal in Temp
   Temp 30-40 then Its Hot
   Temp >=40 then Its Very Hot
5. In the project above, also convert the Celsius temperature to Fahrenheit.
6. **U.S. Federal Income Tax**: Assume a Single filing status, take in a taxable amount and report the tax due. Or **Request** the filing status and use the appropriate column in the table:

(for taxes due in April 2020)

Tax rate	Single	Married, filing jointly
10%	$0 to $9,700	$0 to $19,400
12%	$9,701 to $39,475	$19,401 to $78,950
22%	$39,476 to $84,200	$78,951 to $168,400
24%	$84,201 to $160,725	$168,401 to $321,450

Example: Single 50000:
Tax = .10(9700) + .12*(39475-9700) + .22*(50000-39475)*

7. In the Income Tax project above, input the amount already paid and determine the balance due. If the balance is less than 0 report a Refund otherwise report a Balance Due.
8. Numeric grade to letter grade: Let's assume a school uses the following scale to determine a letter grade: 90 or above = A; 80-89 = B; 70-79 = C; 60-69 = D; below 60 = E. Write a program **lettergrade()** that converts a number grade to the corresponding letter grade. Can you include +'s and –'s (like B+ and B-)?

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9. Write a program to calculate **wages**:
    a. Enter an hourly rate of pay, and the number of hours worked.
    b. Overtime (1.5*rate of pay per hour) is paid for the hours worked over 40 hours. Display the regular pay, the overtime pay, and the total pay.
    c. Federal withholding is 12% for all individuals (not really!). Calculate and deduct the withholding amount and report he net pay.
    d. Also include FICA and state withholding calculations.

10. **Is it a solution? Linear equations:** Write a program that asks the user to enter the slope and y-intercept for a line in the form y = m*x + b. Ask the user to enter a coordinate pair x,y and determine if the coordinate pair is a solution to the linear equation.

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