

## ASSIGNMENT SET – 3

1. Write a program that allows a user to enter a string containing a day of the week (“Sunday,” “Monday,” “Tuesday,” etc.) and uses a switch construct to convert the day to its corresponding number, where Sunday is considered the first day of the week and Saturday is considered the last day of the week. Print out the resulting day number. Also, be sure to handle the case of an illegal day name! (Note: Be sure to use the ‘s’ option on function input so that the input is treated as a string.)
2. Australia is a great place to live, but it is also a land of high taxes. In 2002, individual citizens and residents of Australia paid the following income taxes:

<b>Taxable Income (in A\$)</b>	<b>Tax on This Income</b>
\$0–\$6,000	None
\$6,001–\$20,000	17¢ for each \$1 over \$6,000
\$20,001–\$50,000	\$2,380 plus 30¢ for each \$1 over \$20,000
\$50,001–\$60,000	\$11,380 plus 42¢ for each \$1 over \$50,000
Over \$60,000	\$15,580 plus 47¢ for each \$1 over \$60,000

In addition, a flat 1.5% Medicare levy is charged on all income. Write a program to calculate how much income tax a person will owe based on this information. The program should accept a total income figure from the user and calculate the income tax, Medicare levy, and total tax payable by the individual.

3. The electricity accounts of residents in a very small town are calculated as follows:
  - If 500 units or fewer are used, the cost is 2 cents per unit.
  - If more than 500 but not more than 1000 units are used, the cost is \$10 for the first 500 units and 5 cents for every unit in excess of 500.
  - If more than 1000 units are used, the cost is \$35 for the first 1000 units plus 10 cents for every unit in excess of 1000.
  - A basic service fee of \$5 is charged, no matter how much electricity is used.

Write a program that enters the following five consumptions into a vector and display the total charge for each one: 200, 500, 700, 1000, and 1500.

4. Write a MATLAB code to add, subtract, multiply and divide two complex numbers depending on the user’s choice (e.g. 1-ADDITION, 2-SUBTRACTION, 3-MULTIPLICATION, 4-DIVISION). Prompt the user to input the real and imaginary part of the two complex numbers separately.

5. The tangent is defined as  $\tan \theta = \sin \theta / \cos \theta$ . This expression can be evaluated to solve for the tangent as long as the magnitude of  $\cos \theta$  is not too near to zero. (if  $\cos \theta$  is zero, evaluating the equation of  $\tan \theta$  will produce non-numerical value Inf)

Assume that  $\theta$  is given in degrees and write the MATLAB statements to evaluate  $\tan \theta$  as long as the magnitude of  $\cos \theta$  is greater than or equal to  $10^{-20}$ . If the magnitude of  $\cos \theta$  is less than  $10^{-20}$ , write out an error message instead.

6. The cost of sending a package by an express delivery service is \$15 for the first two pounds, and \$5 for each pound or fraction thereof over two pounds. If the package weighs more than seventy pounds, a \$15 excess weight surcharge is added to the cost. No package over 100 pounds will be accepted. Write a programme that accepts the weight of a package in pounds and compute the cost of mailing the package. Be sure to handle the case of overweight packages.

7. Write a MATLAB program to evaluate the function

$$y(x) = \ln\left(\frac{1}{1-x}\right)$$

for any user specified value of 'x', where x is a number less than one. (Note that ln is the natural logarithm). Use an if structure to verify that the value passed to the program is legal. If the value of x is legal, calculate y(x). If not write a suitable error message.

8. Write a MATLAB program to prompt the user to input distance in meter and convert it to centimeter, millimeter, feet and inch using "switch" structure.