Rajarata University of Sri Lanka
Department of Computing

ICT 1402 - Principles of Program Design and Programming
Tutorial 09 / Portfolio Activity

1. Type in and run all programs presented in lecture note 9. Briefly describe the theory/ concept you learned from these programs separately.

2. Swap two values stored in two different variables.

3. Check whether an entered number is negative, positive or zero.

4. Check whether an entered year is leap year or not.

5. Write a program that asks the user to type in two integer values at the terminal. Test these two numbers to determine if the first is evenly divisible by the second, and then display an appropriate message at the terminal.

6. Write a program that accepts two integer values typed in by the user. Display the result of dividing the first integer by the second, to three-decimal-place accuracy. Remember to have the program check for division by zero.

7. Write a program that takes an integer keyed in from the terminal and extracts and displays each digit of the integer in English. So, if the user types in 932, the program should display nine three two. Remember to display "zero" if the user types in just a 0.

8. Input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:

    a. Percentage >= 90% : Grade A
    b. Percentage >= 80% : Grade B
    c. Percentage >= 70% : Grade C
    d. Percentage >= 60% : Grade D
    e. Percentage >= 40% : Grade E
    f. Percentage < 40% : Grade F

9. Input basic salary of an employee and calculate its Gross salary according to following: (note: HRA and DA are allowances)

    a. Basic Salary <= 10000 : HRA = 20%, DA = 80%
    b. Basic Salary <= 20000 : HRA = 25%, DA = 90%
    c. Basic Salary > 20000 : HRA = 30%, DA = 95%

10. Write a program that acts as a simple "printing" calculator. The program should allow the user to type in expressions of the form number operator: The following operators should be recognized by the program: + - * / S E
The S operator tells the program to set the "accumulator" to the typed-in number.
The E operator tells the program that execution is to end.
The arithmetic operations are performed on the contents of the accumulator with the number that was keyed in acting as the second operand. The following is a "sample run" showing how the program should operate:

Begin Calculations
10 S *Set Accumulator to 10*
= 10.000000 *Contents of Accumulator*
2 / *Divide by 2*
= 5.000000 *Contents of Accumulator*
55 - *Subtract 55*
-50.000000
100.25 S *Set Accumulator to 100.25*
= 100.250000
4 * *Multiply by 4*
= 401.000000
0 E *End of program*
= 401.000000
End of Calculations.

Make certain that the program detects division by zero and also checks for unknown operators.

11. Input electricity unit charges and calculate total electricity bill according to the given condition:

    a. For first 50 units Rs. 0.50/unit
    b. For next 100 units Rs. 0.75/unit
    c. For next 100 units Rs. 1.20/unit
    d. For unit above 250 Rs. 1.50/unit
    e. An additional surcharge of 20% is added to the bill

12. An envelope manufacturing company hires people to make envelopes. They provide all the raw material needed and pay at the following rates. Write a program to input the no of envelopes made and to calculate and print the amount due

Envelopes	Rate
1-1000	75 cents
1001-1500	1 rupee
1501-2000	1 rupee and 15 cents
2001-	1 rupee and 25 cents

13. Find the number of separate Notes and coins required to represent a given monetary value. E,g, 2700 required 1 → 2000 note, 1→ 500 note and 2→100 notes.

14. Display Age, Birthday, and Gender using a given National Identity Card number.