Topics in Applied Mathematics Exercise

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0. Install Python and Jupyter Notebook (or any other IDEs) on your own computer.

1. Write a program that prints the sum of the first 10 positive integers.

2. Write a program that prints the product of the first 10 positive integers.

3. The initial balance of an account is 1,000 won, and it earns 5% interest every year. Write a program that prints the account balance after 1 year, 2 years, and 3 years.

4. Write a program that prints three items, such as the name of your best friend or your favorite movie, on three separate lines.

5. Write a program that calculates and prints the perimeter and diagonal length of a letter-sized paper (8.5 cm $\times$ 11 cm).

6. Write a program that takes a number as input and displays the square, cube, and fourth power of the number.

7. Write a program that prompts the user to enter the following:

- The number of gallons of gasoline in the fuel tank (L)
- The fuel efficiency in miles per gallon (km/L)
- The price of gasoline per gallon (won/L)

Then, print the cost per 100km and the distance the car can travel with the current amount of gasoline in the tank.

8. Write a program that takes a car number input in the format '187누 5103' and outputs the last four digits.

9. Write a program that prints the string a='python' in reverse.

10. Let's assign phone_number='010-1111-2222'. Write a program that outputs the string with the '-' characters removed from phone_number.

11. Write a program that takes an arbitrary string as input and replaces all lowercase 'a' characters in the string with uppercase 'B' characters.

12. Write a program that takes an integer as input and prints whether it is negative, zero, or positive.

13. Write a program that takes three numbers as inputs and prints "All same" if they are all the same, "All different" if they are all different, and "None of the above" otherwise.

14. Write a program that converts a letter grade to a numeric grade. The grades are given as A, B, C, D, or F, and may be followed by a + or -. The corresponding numeric values are 4, 3, 2, 1, and 0. There is no F+ or F- and a + or - adjusts the value by ± 0.3

15. Write a program that takes three string literals as inputs and sorts them in lexicographical order.

16. A year with 366 days is called a leap year. A year is a leap year if it is divisible by 4. However, if it is divisible by 100, it is not a leap year unless it is also divisible by 400. Write a program that takes a year as input and determines whether it is a leap year.