Programming 1: Lab 4 : Operators, Expressions, Conditions and Loops

Write the python code for the following questions. Handle all the valid and invalid test cases. Write down relevant comments in your code:

1. A company decided to give bonus of 5% to employee if his/her year of service is more than 5 years. Ask user for their salary and years of service and print the net bonus amount.
2. Write a program that **reads input data from the console - a password** (one line of random text) and checks if the input **matches** the phrase "**s3cr3t!P@ssw0rd**". If it matches, print "**Welcome**", otherwise print "**Wrong password!**".
3. Write a program that reads input data from the console - **the measures of a geometric shape** and **calculates its area**. There are four types of shapes: **square**, **rectangle**, **circle** and **triangle**.

   The first line of input is the type of shape (**square**, **rectangle**, **circle**, **triangle**):
   If the shape is a **square**, the next argument will be one number - the length of its side.
   If the shape is a **rectangle**, the next argument will be two numbers - the lengths of its sides.
   If the shape is a **circle**, the next argument will be one number - the radius of the circle.
   If the shape is a **triangle**, the next argument will be two numbers - its base and the corresponding altitude.

   The result should be rounded up to the **third decimal point**.
4. Write a program that reads **two integers - hours and minutes** based on a 24-hour day format and calculates what time it will be **15 minutes later**. The result should be printed in the following format **hh:mm**. Hours should always be between 0 and 23, while minutes should always be between 0 and 59. Hours should be written with one or two digits as needed, while the minutes should always be written with two digits - add a **leading zero**, as needed. Example, Given the time 1:46 as input, the output displayed should be 2:01.
5. A student has to travel **n kilometers**. He can choose between **three types of transportation**:

   Taxi. Starting fee: **33.58 INR**. Day rate: **37.89** INR/km. Night rate: **43.17** INR/km.
   Bus. Day / Night rate: **4.32** INR/km. Can be used for distances of a minimum of **20** km.
   Train. Day / Night rate: **2.88** INR/km. Can be used for distances of a minimum of **100** km.

   Write a program that reads the number of **kilometers n** and **period of the day** (day or night) and calculates **the price for the cheapest transport.**
6. **Tom Cat** likes to sleep all day but, unfortunately, his owner is always playing with him whenever he has free time. To sleep well, **the norm of games** that Tom has is **30,000 minutes per year**. The time for games he has **depends on the holidays that his owner has**:
   - During **workdays**, his owner plays with him **63 minutes per day**.
   - During **holidays**, his owner plays with him **127 minutes per day**.

   Write a program that reads **the number of holidays** and prints whether **Tom can sleep well** and how much **the difference from the norm** for the current year is. It is assumed that **there are 365 days in one year**.
7. Most of the people start planning their vacations well in advance. A young programmer from Bulgaria has a certain budget (BGN is the currency of Bulgaria) and spare time in a particular season.

   Write a program that accepts as input the **budget** and **season** and as output **displays programmer's vacation place** and the **amount of money they will spend**.

   The budget determines the destination, and the season determines what amount of the budget will be spent. If the season is summer, the programmer will go camping, if it is winter – he will stay

in a hotel. If it is in Europe, regardless of the season, the programmer will stay in a hotel. Each camp or hotel, according to the destination, has its price, which corresponds to a particular percentage of the budget:

- If **100 BGN or less** – somewhere in **Bulgaria**.
  Summer – 30% of the budget
  Winter – 70% of the budget.
- If **1000 BGN or less** – somewhere in the **Balkans**.
  Summer – 40% of the budget.
  Winter – 80% of the budget.
- If **more than 1000 BGN** – somewhere in **Europe**.
  Upon traveling in Europe, regardless of the season, the programmer will spend 90% of the budget.

8. Write a program that finds all numbers in the range [**1 … 1000**], that end in 6.
9. Write a program that reads n integers and finds their sum.
10. Take a positive integer N as input and print its table as follows:

    N x 1 = N
    N x 2 = 2N
    ……
    N x 20 = 20N