HOMEWORK 2

Problem 1. Indicate whether the expression evaluates to True or False. $x = 7$, $y = 9$.

(1) $x > 5$.
(2) $(x > 5)$ and $(y < 20)$
(3) $(x > 10)$ and $(y < 20)$
(4) $(x > 10)$ or $(y < 20)$
(5) $(x > 10)$ or $(y > 20)$
(6) NOT $(x > 10)$
(7) NOT $((x > 5)\text{and}(y < 20))$

Problem 2. What is the printed value of y in each of the following cases?

(1)
```
x = 10
if x > 5:
    y = x**2-1
elif x >= 5 and x <=10:
    y = 2*x
else:
    y = 2**x
print(y)
```

(2)
```
x = 25
if x < 20:
    y = 0.1 * x
elif x <= 50:
    y = 0.2 * x
else:
    y = 0.3 * x
print(y)
```

(3)
```
x = 5
if x > 10:
    y = x * 2
elif x == 10:
    y = x + 5
else:
    y = x - 3
print(y)
```

Problem 3. A student is taking a course with a Pass/Fail option. Their final grade is determined by the final exam score and any bonus points they receive. The passing criteria are as follows:

- The student passes if the total score, which is the sum of the exam score and bonus points, is 80 or above.
- If the total score is below 80, the student fails.

Define variables that represent the final score and the bonus points of a student. Based on these values, determine whether this student passes or fails the course.

Problem 4. A university classifies its size based on the number of students enrolled. The rule for its classification system is as follows

- A university is classified as "Medium-sized" if the number of students enrolled is between 3,000 and 16,000 inclusive.
- If the number of students enrolled is outside this range, it is classified as not medium-sized.

Write a program that takes the number of students enrolled as input. Determines if the university is "Medium-sized" or not based on the given range.

Problem 5. A small company in Madison Wisconsin offers benefits based on employee work hours and tenure. The eligibility criteria for benefits are as follows: An employee is eligible for benefits if at least one of the following conditions is satisfied

(1) They have worked at least 40 hours per week and have been with the company for 2 years or more.
(2) Or, if they have worked at least 30 hours per week and have been with the company for 5 years or more.

Write a Python program that takes the number of hours worked per week and years with the company of an employee as input. Based on these values, determine whether this employee is eligible for benefits.

Problem 6. Write a Python program that takes a password as input and prints:

- "Strong" if the password length is greater than 12 characters.
- "Moderate" if the password length is between 8 and 12 characters (inclusive).
- "Weak" if the password length is less than 8 characters.

Problem 7. You are organizing an event where ticket prices vary based on the attendee's age. Write a program that takes the age of an attendee as input and determines the ticket price according to the following rules.

- Toddler (ages 0-2): Free.
- Children (ages 3-12) pay $10.
- Teenagers (ages 13-19) pay $15.

- Adults (ages 20-64) pay $20.
- Seniors (ages 65 and above) pay $8.

Problem 8. A clothing store offers a discount based on the amount spent by a customer. The discounts are applied as follows.

- If the total amount spent is greater than $200, the customer gets a 20 % discount.
- If the total amount spent is between $120 and $200, the customer gets a 15 % discount.
- If the total amount spent is between $80 and $120, the customer gets a 10 % discount.
- Otherwise, there's no discount.

Define a variable that represents the amount spent and calculate the final payment.

Problem 9. Amazon offers different shipping rates based on the weight of a package and whether the customer has an Amazon Prime membership. It uses the following rules to calculate shipping costs:

- Amazon Prime Members: All packages, regardless of weight, ship for free.
- Non-Prime Members:
  (1) Zone 1 (Local): Packages up to 10 lb: $10. Packages over 10 lb: $20.
  (2) Zone 2 (International): Packages up to 10 lb: $30, Packages over 10 lb: $50.

Write a program that calculates the shipping cost based on the variables that represent package weight, destination zone, and whether the customer has Amazon Prime.

Problem 10. A childcare center provides financial assistance based on family income. The assistance categories are:

- "Full Assistance" if the family income is $40,000 or less.
- "Partial Assistance" if the family income is between $40,001 and $70,000.
- "No Assistance" if the family income is above $70,000.

Write a Python program to ask the user to enter the family income. Based on their answer, determine the type of assistance.