

Sample Coding Questions

Control Structures

Number Comparison

Problem: Write a program that reads two numbers

#from the user and determines which one is greater or if they are equal.

```
num1 = float(input("Enter the first number: "))  
num2 = float(input("Enter the second number: "))
```

```
if num1 > num2:  
    print(f"{num1} is greater than {num2}.")  
elif num2 > num1:  
    print(f"{num2} is greater than {num1}.")  
else:  
    print("Both numbers are equal.")
```

Positive, Negative, Zero

Problem: Build a program that reads a number from the

#user and determines whether it is positive, negative, or zero.

```
number = float(input("Enter a number: "))
```

```
if number > 0:  
    print("The number is positive.")  
elif number < 0:
```

```
    print("The number is negative.")
else:
    print("The number is zero.")
```

Grading System

Problem: Create a program that reads a student's exam score from the user and

#assigns a grade based on the following criteria:

#90-100 (A), 80-89 (B), 70-79 (C), 60-69 (D), below 60 (F).

```
score = float(input("Enter the exam score: "))
```

```
if score >= 90:
```

```
    grade = "A"
```

```
elif score >= 80:
```

```
    grade = "B"
```

```
elif score >= 70:
```

```
    grade = "C"
```

```
elif score >= 60:
```

```
    grade = "D"
```

```
else:
```

```
    grade = "F"
```

```
print(f"The grade is: {grade}")
```

Number Parity

**# Problem: Write a program that takes an integer
#from the user and determines whether it's even or odd.**

```
number = int(input("Enter an integer: "))
```

```
if number % 2 == 0:
```

```
    print("The number is even.")
```

```
else:
```

```
    print("The number is odd.")
```

Nested if for Age and Movie Rating

**# Problem: Develop a program that asks the user for
#their age and checks whether they are eligible to watch a
#movie rated as follows: PG (age 7 and above), PG-13 (age 13 and above),
#R (age 17 and above), NC-17 (age 18 and above).**

```
age = int(input("Enter your age: "))
```

```
movie_rating = input("Enter the movie rating (PG, PG-13, R, NC-17): ")
```

```
if age >= 18:
```

```
    print("You are eligible to watch any movie.")
```

```
elif age >= 17 and movie_rating in ["R", "NC-17"]:
```

```
    print("You are eligible to watch R or NC-17 movies.")
```

```
elif age >= 13 and movie_rating in ["PG", "PG-13"]:
```

```
    print("You are eligible to watch PG and PG-13 movies.")
```

```
elif age >= 7 and movie_rating == "PG":  
    print("You are eligible to watch PG movies.")  
else:  
    print("You are not eligible to watch this movie.")
```

Ticket Price

Problem: Create a program that reads a person's age and determines the ticket price

#for a theme park based on the following rules:

#Age 0-3 (free), Age 4-12 (\$10), Age 13-17 (\$15), Age 18 and above (\$20).

```
age = int(input("Enter your age: "))  
  
if age <= 3:  
    ticket_price = 0  
elif age <= 12:  
    ticket_price = 10  
elif age <= 17:  
    ticket_price = 15  
else:  
    ticket_price = 20  
  
print(f"The ticket price is: ${ticket_price}")
```

Guess the Number

Problem: Write a program that generates a random number between 1 and 100 and

#lets the user guess it. Provide feedback whether the guess is

#too high, too low, or correct. Repeat until the user guesses correctly.

```
import random
```

```
target_number = random.randint(1, 100)
```

```
while True:
```

```
    user_guess = int(input("Guess the number (1-100): "))
```

```
    if user_guess < target_number:
```

```
        print("Too low. Try again.")
```

```
    elif user_guess > target_number:
```

```
        print("Too high. Try again.")
```

```
    else:
```

```
        print("Congratulations! You guessed the number.")
```

```
        break
```

Voting Eligibility

Problem: Create a program that reads a person's age and citizenship status,

and determines if they are eligible to vote in an election.

#Eligibility criteria: Age 18 and above, and a citizen.

```
age = int(input("Enter your age: "))
```

```
citizen = input("Are you a citizen? (yes/no): ").lower()
```

```
if age >= 18 and citizen == "yes":  
    print("You are eligible to vote.")  
else:  
    print("You are not eligible to vote.")
```

Triangle Classification

Problem: Write a program that reads the lengths of three sides of a triangle and

#determines whether it is equilateral (all sides equal),

#isosceles (two sides equal), or scalene (no sides equal).

```
side1 = float(input("Enter the length of the first side: "))  
side2 = float(input("Enter the length of the second side: "))  
side3 = float(input("Enter the length of the third side: "))  
  
if side1 == side2 == side3:  
    triangle_type = "equilateral"  
elif side1 == side2 or side1 == side3 or side2 == side3:  
    triangle_type = "isosceles"  
else:  
    triangle_type = "scalene"  
  
print(f"The triangle is {triangle_type}.")
```

Vowel or Consonant

Problem: Create a program that reads a character from the user and determines

#whether it is a vowel or a consonant.

#Assume the input is a lowercase letter.

```
character = input("Enter a character: ").lower()
```

```
if character in "aeiou":
```

```
    print("It's a vowel.")
```

```
else:
```

```
    print("It's a consonant.")
```

Arithmetic Operations

Problem: Create a program that reads two numbers from the user and

#performs the following arithmetic operations:

Addition

Subtraction

Division

Modulus (Remainder)

Floor Division

Exponentiation (Power)

For each operation, display the result along with a meaningful message.

Read two numbers from the user

```
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))

# Perform arithmetic operations
operation = input("Enter the operation (+, -, /, %, //, **): ")

if operation == "+":
    result = num1 + num2
    print(f"Addition: {num1} + {num2} = {result}")
elif operation == "-":
    result = num1 - num2
    print(f"Subtraction: {num1} - {num2} = {result}")
elif operation == "/":
    if num2 != 0:
        result = num1 / num2
        print(f"Division: {num1} / {num2} = {result}")
    else:
        print("Division by zero is not allowed.")
elif operation == "%":
    if num2 != 0:
        result = num1 % num2
        print(f"Modulus: {num1} % {num2} = {result}")
    else:
        print("Modulus by zero is not allowed.")
elif operation == "//":
    if num2 != 0:
```



```
    result = num1 // num2
    print(f"Floor Division: {num1} // {num2} = {result}")
else:
    print("Floor division by zero is not allowed.")
elif operation == "**":
    result = num1 ** num2
    print(f"Exponentiation: {num1} ** {num2} = {result}")
else:
    print("Invalid operation.")
```

Eligibility for Student Council

Problem: Write a program that reads a student's grade and whether they have a

clean disciplinary record. Determine if the student is eligible to run

for the student council,

given the criteria: Grade 9-12 and clean disciplinary record.

```
grade = int(input("Enter your grade (9-12): "))
disciplinary_record = input("Do you have a clean disciplinary record? (yes/no): ").lower()

if grade >= 9 and grade <= 12 and disciplinary_record == "yes":
    print("You are eligible to run for the student council.")
else:
    print("You are not eligible to run for the student council.")
```

Movie Ticket Discount

Problem: Create a program that determines if a customer is eligible for a

movie ticket discount. The criteria are having a

student ID or being a senior citizen (age 60 and above).

```
student_id = input("Do you have a student ID? (yes/no): ").lower()
```

```
age = int(input("Enter your age: "))
```

```
if student_id == "yes" or age >= 60:
```

```
    print("You are eligible for a movie ticket discount.")
```

```
else:
```

```
    print("You are not eligible for a movie ticket discount.")
```

Username and Password Validation

Problem: Write a program that reads a username and password from the user.

Validate whether both the username and password meet certain criteria:

Username length at least 5 characters and password length at least 8 characters.

```
username = input("Enter your username: ")
```

```
password = input("Enter your password: ")
```

```
if len(username) >= 5 and len(password) >= 8:
```

```
    print("Username and password meet the criteria.")
```

```
else:
```

```
    print("Username and/or password do not meet the criteria.")
```

Ticket Availability

Problem: Create a program that determines whether a user can book tickets for a concert.

The criteria are having enough available tickets and being older than 10 years.

```
available_tickets = int(input("Enter the number of available tickets: "))
```

```
age = int(input("Enter your age: "))
```

```
if available_tickets > 0 and age > 10:
```

```
    print("You can book tickets for the concert.")
```

```
else:
```

```
    print("You are not eligible to book tickets for the concert.")
```

Number Range

Problem: Write a program that reads a number from the user and

determines if it is in the range of 10 to 50 (inclusive) or not.

```
number = float(input("Enter a number: "))
```

```
if number >= 10 and number <= 50:
```

```
    print("The number is in the range of 10 to 50.")
```

```
else:
```

```
    print("The number is not in the range of 10 to 50.")
```

Loan Eligibility

Problem: Create a program that determines whether a person is eligible for a loan.

The criteria are having a credit score of 700 or

above and an annual income of at least \$50,000.

```
credit_score = int(input("Enter your credit score: "))
```

```
income = float(input("Enter your annual income: "))
```

```
if credit_score >= 700 and income >= 50000:
```

```
    print("You are eligible for a loan.")
```

```
else:
```

```
    print("You are not eligible for a loan.")
```

Entrance Fee

Problem: Write a program that calculates the entrance fee for a zoo based on age.

Children (age 0-12) pay \$5,

adults (age 13-64) pay \$10, and seniors (age 65 and above) pay \$7.

```
age = int(input("Enter your age: "))
```

```
if age <= 12:
```

```
    fee = 5
```

```
elif age <= 64:
```

```
    fee = 10
```

```
else:
```

```
fee = 7
```

```
print(f"The entrance fee is: ${fee}")
```

Credit Card Validation

Problem: Develop a program that validates a credit card based on the card's

expiration month (1-12) and whether it's a Mastercard or Visa.

```
expiration_month = int(input("Enter the expiration month (1-12): "))
```

```
card_type = input("Enter card type (Mastercard/Visa): ").lower()
```

```
if (expiration_month >= 1 and expiration_month <= 12) and (card_type ==  
"mastercard" or card_type == "visa"):
```

```
    print("Credit card is valid.")
```

```
else:
```

```
    print("Credit card is not valid.")
```

Discount Calculation

Problem: Write a program that calculates the total cost of an item after applying a

discount. If the purchase amount is at least \$100 and

the customer is a member (yes/no), a 10% discount is applied.

```
purchase_amount = float(input("Enter the purchase amount: "))
```

```
is_member = input("Are you a member? (yes/no): ").lower()
```

```
if purchase_amount >= 100 and is_member == "yes":
```

```
discount = 0.1 * purchase_amount
total_cost = purchase_amount - discount
else:
    total_cost = purchase_amount

print(f"The total cost after discount is: ${total_cost:.2f}")
```

Scholarship Eligibility

**# Problem: Create a program that determines if a student is eligible for
a scholarship based on their GPA (≥ 3.5) and
participation in extracurricular activities (yes/no).**

```
gpa = float(input("Enter your GPA: "))
activities_participation = input("Do you participate in extracurricular activities?
(yes/no): ").lower()

if gpa >= 3.5 and activities_participation == "yes":
    print("You are eligible for a scholarship.")
else:
    print("You are not eligible for a scholarship.")
```

Fast Food Menu Selection

**# Problem: Build a program for a fast-food restaurant that recommends a
meal
based on customer preferences.
Consider vegetarian, budget, and time constraints.**

```
is_vegetarian = input("Are you vegetarian? (yes/no): ").lower()
budget = float(input("Enter your budget: "))
time_available = int(input("Enter time available (minutes): "))

if is_vegetarian == "yes":
    if budget >= 10 and time_available >= 15:
        recommended_meal = "Vegetarian Burger"
    else:
        recommended_meal = "Salad"
else:
    if budget >= 15 and time_available >= 20:
        recommended_meal = "Chicken Burger"
    else:
        recommended_meal = "Fries"

print(f"We recommend: {recommended_meal}")
```

Vacation Planner

Problem: Write a program that helps users plan their vacation

destination based on weather conditions and budget.

Consider temperature (warm or cold) and budget constraints.

```
weather = input("Is the weather warm or cold? ").lower()
budget = float(input("Enter your budget: "))

if weather == "warm":
```

```

if budget >= 1000:
    recommended_destination = "Beach Resort"
else:
    recommended_destination = "Local Park"
else:
    if budget >= 1500:
        recommended_destination = "Ski Lodge"
    else:
        recommended_destination = "Cozy Cabin"

print(f"We recommend: {recommended_destination}")

```

BMI Calculator and Classification

Problem: Write a program that calculates the Body Mass Index (BMI) of a person based on their weight and height.

#formula -weight / (height ** 2)

#less than 18.5 - "Underweight" less than 25 - "Normal" less than 30 - "Overweight"

#last option - "Obese"

Classify the BMI as underweight, normal weight, overweight, or obese.

```
weight = float(input("Enter your weight (kg): "))
```

```
height = float(input("Enter your height (m): "))
```

```
bmi = weight / (height ** 2)
```

```
if bmi < 18.5:
```



```
    classification = "Underweight"
elif bmi < 25:
    classification = "Normal weight"
elif bmi < 30:
    classification = "Overweight"
else:
    classification = "Obese"

print(f"Your BMI is {bmi:.2f} and you are classified as {classification}.")
```

Movie Recommendation

Problem: Build a program that recommends a movie genre based on the
user's mood (happy or sad) and
age group (child or adult).

```
mood = input("Are you feeling happy or sad? ").lower()
age_group = input("Are you a child or an adult? ").lower()
```

```
if mood == "happy":
    if age_group == "child":
        recommended_genre = "Animated"
    else:
        recommended_genre = "Comedy"
else:
    if age_group == "child":
        recommended_genre = "Adventure"
```

else:

recommended_genre = "Drama"

print(f"We recommend watching a {recommended_genre} movie.")

Ticket Pricing and Age Categories

Problem: Write a program that determines the price of a ticket for a show based on age.

Categories: Child (3-12), Adult (13-64), and Senior (65 and above).

age = int(input("Enter your age: "))

if age >= 65:

ticket_price = 5

elif age >= 13:

ticket_price = 10

elif age >= 3:

ticket_price = 7

else:

ticket_price = 0

print(f"The ticket price is \${ticket_price}.")

Weather Adviser

Problem: Develop a program that gives advice based on weather conditions and

the user's preferences.

Consider temperature and whether it's raining.

```
temperature = float(input("Enter the current temperature (°C): "))
```

```
is_raining = input("Is it raining? (yes/no): ").lower()
```

```
if temperature >= 30 and not is_raining == "yes":
```

```
    advice = "It's a hot day, consider wearing light clothing and staying hydrated."
```

```
elif temperature < 30 and is_raining == "no":
```

```
    advice = "It's a nice day, enjoy the outdoors!"
```

```
elif is_raining == "yes":
```

```
    advice = "Take an umbrella with you."
```

```
else:
```

```
    advice = "Wear layers to stay comfortable."
```

```
print(advice)
```