Homework 2. Conditional Ststaments & Loops (Questions)

Assignment Submission Guidelines

Please follow the guidelines below for submitting your assignment:

1. **Submission Deadline:**
   - All assignments must be submitted **no later than 23:59PM next Tuesday (02/03)**.
   - Late submissions will not be accepted unless prior arrangements have been made by the TAs.
2. **Submission Platform:**
   - Submit your assignment through **Canvas**. Ensure that you upload the files to the correct assignment link.
3. **Required Files:**
   - **Python Script (.ipynb file):** Submit the Python script you used to complete the assignment. The file should contain your well-commented code.
   - **PDF Version (.pdf file):** Additionally, submit a PDF version of your Python code. This can be a printout or export of your script, showing all the code with any necessary explanations or output results included.
4. **File Naming Convention:**
   - Please name your files as follows: `Lastname_Firstname_AssignmentName`
   - Example: `Alex_John_HW2.ipynb` and `Alex_John_HW2.pdf`
5. **Technical Issues:**
   - If you encounter any technical issues with Canvas or your submission, please contact the TAs immediately **before the deadline** to avoid penalties.

Questions

Question 1: Write a program to check if a given number is positive. (5 Points)

In [ ]:
```
# Getting user input.
user_number = float(input('Enter any number:'))

# Checking for positivity.
if user_number > 0:
```

```
    print('This number is positive')
# Checking for zero.
elif user_number == 0:
    print('This number is identially equal to zero.')
# If not positive or zero, must be negative.
else:
    print('This number is negative.')
```

```
This number is positive
```

Question 2: Write a program to check if a given number is zero.(5 Points)

In [ ]:
```
# User input.
is_this_zero = float(input('Enter a number:'))

# Using zero equality as main condition, else non-zero.
if is_this_zero == 0:
    print('This is definitely zero.')
else:
    print('You did not enter zero.')
```

```
You did not enter zero.
```

Question 3: Write a program to check if a number is even or odd.(5 Points)

In [45]:
```
# User input.
odd_even_num = int(input('Enter an integer:'))

# Categorizing based on even condition, else odd.
if odd_even_num % 2 == 0:
    print(f'{odd_even_num} is an even number.')
else:
    print(f'{odd_even_num}  is an odd number.')
```

```
100240240 is an even number.
```

Question 4: Write a program to categorize a person's age: Child (< 13), Teen (13-19), Adult (>= 20).(5 Points)

In [ ]:
```
# User input.
age = int(input('Enter an age:'))

# Categorizing by age.
if age >= 20:
    print('This is an adult.')
elif age >= 13 and age <= 19:
    print('This is a teen.')
elif age < 13:
    print('This is a child.')
```

```
This is an adult.
```

Question 5: Write a program to find the largest among three numbers.(5 Points)

In [3]:
```
# Getting user input for all three numbers.
num_1 = int(input('Enter the first number.'))
num_2 = int(input('Enter the second number.'))
num_3 = int(input('Enter the third number.'))

# First comparison for num_1.
if (num_1 >= num_2) and (num_1 >= num_3):
    largest = num_1

# Second comparison for num_2.
elif (num_2 >= num_1) and (num_2 >= num_3):
    largest = num_2

# Else, last number must be the largest.
else:
    largest = num_3

print(f"The largest number is {largest}.")
```

```
The largest number is 5.
```

Question 6: Write a program to check if a year is a leap year.(5 Points)

In [4]:
```
# Getting the year input.
year = int(input("Input a year: "))

# We will not consider the year zero.
if year <= 0:
    print("Cannot check leap year for year 0 or negative years!")
else:
    # Checking the 400-year rule first.
    if year % 400 == 0:
        print(f"{year} is a leap year.")
    # Checking the 100-year rule next.
    elif year % 100 == 0:
        print(f"{year} is NOT a leap year.")
    # Checking the normal 4-year rule last.
    elif year % 4 == 0:
        print(f"{year} is a leap year.")
    # If none of the above are triggered, it's just a regular year.
    else:
        print(f"{year} is NOT a leap year.")
```

```
1995 is NOT a leap year.
```

Question 7: Write a for loop that prints numbers from 1 to 10.(5 Points)

In [ ]:
```
# Using range to go from 1 to 10.
for num in range(1,11):
    print(num)
```

```
1
2
3
4
5
6
7
8
9
10
```

Question 8: Use a for loop to print all even numbers between 1 and 20. (5 Points)

In [ ]:
```
# Using range to go from 1 to 20, printing evens only.
for num in range(1,21):
    if num % 2 == 0:
        print(num)
```

```
2
4
6
8
10
12
14
16
18
20
```

Question 9: Write a for loop that counts down from 10 to 1. (5 Points)

In [52]:
```
# Using a negative step over the range.
for num in range(10, 0, -1):
    print(num)
```

```
10
9
8
7
6
5
4
3
2
1
```

Question 10: Write a while loop that prints "Hello" 5 times.(5 Points)

In [ ]:
```
# We want to say hello this many times.
while_counter = 5

# The condition is based on the while_counter.
while while_counter > 0:
    print('Hello')
    # Subtracting 1 from the while counter.
    while_counter -= 1
```

```
Hello
Hello
Hello
Hello
Hello
```

Question 11: Use a while loop to continuously ask the user for input until they enter 'quit'.(10 Points)

In [53]:
```
# Initializing a user_input variable.
user_input = ''

# While the user's string is not equal to the quit string, continue printing
while user_input.lower() != "quit":
    user_input = input('Enter anything, to quit, enter "quit": ')
    if user_input.lower() == "quit":
        break
    print(user_input)
```

```
what
is
this
```

Question 12: Write a program that uses a while loop to sum numbers entered by the user until the user enters 0. Print the total sum after the loop ends.(10 Points)

In [54]:
```
# Starting with an empty list and empty user variable.
num_list = []
user_num_input = None

# While condition is based on user_num_input.
while user_num_input != 0:
    user_num_input = int(input('Enter an integer, enter zero to quit and sum
    # Appeending the user inputs to the list.
    if user_num_input != 0:
        num_list.append(user_num_input)

# Printing the count of numbers they entered and their sum.
print(f'You input {len(num_list)} numbers, and their sum is {sum(num_list)}.
```

```
You input 7 numbers, and their sum is 18.
```

Question 13 (Bonus Quesion): Write a Python program to simulate a simple ATM machine. The program should allow users to check their balance, deposit money, and withdraw money. Use a while loop to repeatedly prompt the user for their choice until they choose to exit. (20 Points)

In [ ]:
```
balance = 1000  # Initial balance
user_input = ""  # Keep as a string

while user_input.lower() != "exit":
    # The initial user prompt or "main menu".
    user_input = input(
        "Welcome to your UTA bank account!\n"
```

```
        "Please enter a number to make a selection:\n"
        "1) Print your Balance\n"
        "2) Make a deposit\n"
        "3) Withdraw cash\n"
        'Type "Exit" to quit.\n'
    )

    # The user exit option, using .lower to make it more reliable.
    if user_input.lower() == "exit":
        break

    # Printing the user's account balance and immediately returning to the m
    if user_input == "1":
        print(f"Your balance is ${balance}.")
        continue

    # Handling the deposit.
    elif user_input == "2":
        deposit = int(input("Enter an integer amount you would like to depos
        # Adding deposit amount to balance.
        balance = balance + deposit
        print(f"Your new balance is ${balance}.")
        # Return to menu or exit
        user_input = input('Enter "Exit" to exit, otherwise press Enter to r
        continue

    # Handling withdraws.
    elif user_input == "3":
        withdraw = int(input("Enter an integer amount you would like to with
        # Subtracting withdraw from balance.
        balance = balance - withdraw
        print(f"Your new balance is ${balance}.")
        # Return to menu or exit
        user_input = input('Enter "Exit" to exit, otherwise press Enter to r
        continue

    else:
        print("Please make a valid selection.")
        continue

print("Thanks for using UTA Bank. Goodbye!")
```

```
Your balance is $1000.
Your balance is $1000.
Your new balance is $124125142.
Your new balance is $124125019.
Your balance is $124125019.
Your balance is $124125019.
Your balance is $124125019.
Your new balance is $1355539143.
Your new balance is $-124122768584981.
Your balance is $-124122768584981.
Your balance is $-124122768584981.
Your balance is $-124122768584981.
Your new balance is $-124122644460857.
Please make a valid selection.
Thanks for using UTA Bank. Goodbye!
```

In [ ]: