مكتب

Homework Assignment

Week 4: Making Programs Interactive

Total Points: 100 — Due: Next Class

Name: _____ **Date:** _____

Important Instructions

- Work on your own, but you may ask family members for hints only if stuck
- Write your code in Python *(using Thonny or any online IDE)*
- For setting up your code files, kindly see `instructions.pdf`
- For written answers, use the spaces provided on this sheet
- Show your work for full credit!

Warmup

What will be the result of each of the following commands? Circle the correct answer:

1. `int("25")` will result in:
   A. 25 (as a number)
   B. "25" (with quotes)
   C. Error
   D. 25.0
2. `str(100)` will result in:
   A. 100 (as a number)
   B. "100" (as text)
   C. Error
   D. 100.0
3. `float("3.14")` will result in:
   A. 3
   B. "3.14"
   C. 3.14
   D. Error
4. `int(3.99)` will result in:
   A. 4

B. 3
C. 3.99
D. Error

5. `bool(0)` will result in:

A. 0
B. True
C. False
D. Error

6. `int("hello")` will result in:

A. 0
B. ”hello”
C. Error
D. None

7. `str(True)` will result in:

A. 1
B. “True”
C. True
D. Error

1 Part 1: Code Completion Practice (15 points)

Time estimate: 20 minutes

1.1 Exercise 1.1: Restaurant Order System (8 points)

Open the file week4_ex1_1.py. Complete this code by replacing blanks to create an interactive restaurant ordering system:

```
# Restaurant Order Taker
print("Welcome to Karachi Kitchen!")

# Get customer information
customer_name = _______("What is your name? ")
table_number = _______(_______(________))    # Get table number as integer

# Get order details
num_samosas = _______("How many samosas? ")         # Convert to number!
num_drinks = _______                                # Get number of drinks

# Calculate the bill
samosa_price = 25
drink_price = 30
total = ___________                                 # Calculate total cost

# Display order summary
print("Order Summary for", ___________)
print("Table:", ___________)
print("Samosas:", ___________)
print("Drinks:", ___________)
print("Total Bill: Rs.", ___________)
```

Save this code in week4_ex1_1.py

1.2 Exercise 1.2: Temperature Reporter (7 points)

Open the file week4_ex1_2.py. Complete the temperature conversion program using f-strings:

```
city = input(___________)
celsius = ___________("Enter temperature in Celsius: ")    # Get as decimal

# Convert to Fahrenheit
fahrenheit = celsius * 9/5 + 32

# Create formatted messages using f-strings
message1 = f"The temperature in {___________} is {___________} C"
message2 = f"That equals {___________} F"

print(message1)
print(message2)
```

Save this code as week4_ex1_2.py

2 Part 2: Problem Solving with User Input (20 points)

Time estimate: 25 minutes

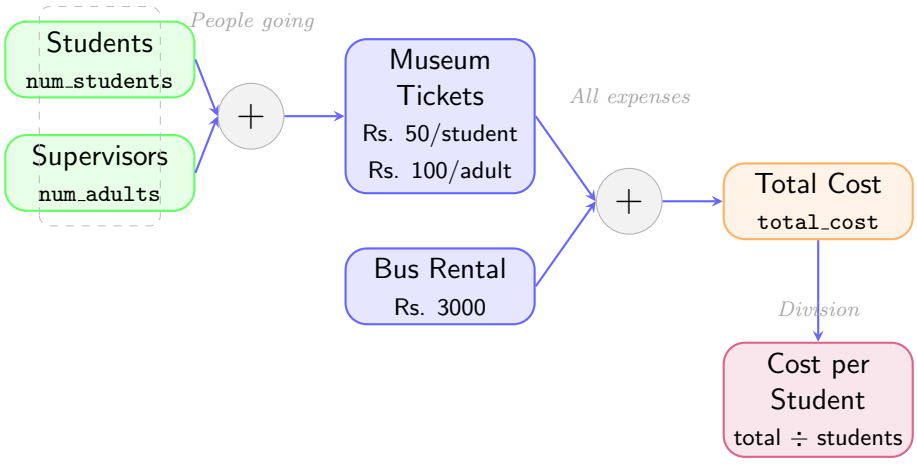
2.1 Exercise 2.1: School Trip Calculator (10 points)

Your class is planning a field trip. Write a program that calculates the total cost and cost per student.

Scenario: Field Trip to Mohatta Palace Museum

The museum charges Rs. 50 per student and Rs. 100 per adult supervisor. The bus costs Rs. 3000 for the day. Your program needs to calculate the total cost and how much each student should pay.

Field Trip Cost Calculation Flow



Open the file week4_ex2_1.py. Complete the code to calculate the total cost and cost per student:

```
print("=== School Trip Calculator ===")

# Step 1: Get the number of people going
num_students = ___________      # Get as integer
num_adults = ___________        # Get as integer

# Step 2: Calculate costs
student_tickets = num_students * 50
```

```
adult_tickets = __________      # Calculate adult ticket cost
bus_cost = 3000
total_cost = __________         # Add all costs together

# Step 3: Calculate per student cost
per_student = __________        # Divide total by number of students

# Step 4: Display results
print(f"Student tickets: Rs. {__________}")
print(f"Adult tickets: Rs. {__________}")
print(f"Bus rental: Rs. {__________}")
print(f"Total cost: Rs. {__________}")
print(f"Each student pays: Rs. {__________}")
```

Save this code as week4_ex2_1.py

2.2 Exercise 2.2: Pizza Party Planner (10 points)

Open the file week4_ex2_2.py. Plan a class pizza party by calculating how many pizzas to order. Replace the blanks with appropriate code to make it interactive:

```
# Get party information
party_name = __________
num_people = __________          # Convert to integer
slices_per_person = __________   # How many slices each person eats

# Pizza calculations
slices_per_pizza = 8
total_slices_needed = __________
pizzas_needed = __________       # Use // for whole pizzas (see tip below)
extra_slices = __________        # Use % for remainder (see tip below)

# Get pizza price
price_per_pizza = __________("Price per pizza in Rs: ")
total_cost = __________

# Display the plan
print(f"\n=== {party_name} Pizza Plan ===")
print(f"People attending: {__________}")
print(f"Total slices needed: {__________}")
print(f"Pizzas to order: {__________}")
print(f"Extra slices: {__________}")
print(f"Total cost: Rs. {__________}")
```

Save this code as week4_ex2_2.py

Tip

- Integer division is done with `//`. It gives you the quotient when one number is divided by another e.g:

  `10 // 3` gives you `3` *(3 whole pizzas).*

- The modulus operator `%` gives you the remainder when one number is divided by another e.g:

  `10 % 3` gives you `1` *(1 extra slice).*

3 Part 3: Code Tracing with Input (15 points)

Time estimate: 20 minutes

3.1 Exercise 3.1: Trace the Shopping Program (8 points)

Trace through this program in your head, assuming the user inputs: `"Ali"`, `"5"`, `"120.50"`

```
name = input("Enter your name: ")              # Line 1
quantity = input("How many items? ")           # Line 2
price = input("Price per item: ")              # Line 3
quantity_num = int(quantity)                   # Line 4
price_num = float(price)                       # Line 5
total = quantity_num * price_num               # Line 6
message = f"{name} bought {quantity_num} items"  # Line 7
print(message)                                 # Line 8
print(f"Total cost: Rs. {total}")              # Line 9
```

Fill in what each variable contains after each line:

Line	name	quantity	price	quantity_num	price_num	total	message
1							
2							
3							
4							
5							
6							
7							

What will the program display?

Line 8 output: _____

Line 9 output: _____

3.2 Exercise 3.2: Input Type Analysis (7 points)

For each blank, write what type of data the variable contains (`str`, `int`, or `float`):

```
age = input("Your age: ")                    # age type: __________

age_next = int(age) + 1                      # age_next type: __________

height = float(input("Height in cm: "))      # height type: __________

name = input("Name: ")                       # name type: __________

score = 95                                   # score type: __________

grade = str(score) + "%"                     # grade type: __________

pi = 3.14                                    # pi type: __________
```

4 Part 4: Debug Detective (20 points)

Time estimate: 25 minutes

Each code snippet has errors related to input and type conversion. Find and fix ALL errors:

4.1 Snippet 1: Age Calculator (7 points)

Open the file week4_ex4_1.py. This code has 5 issues - fix them all!

```
print("Age Calculator)
name = input(Enter your name: )
birth_year = input("What year were you born? ")
current_year = "2024"
age = current_year - birth_year
print(f"Hi {name}, you are age years old!")
```

Save your corrected code as week4_ex4_1.py

4.2 Snippet 2: Rectangle Calculator (7 points)

Open the file week4_ex4_2.py. This code has 5 issues - fix them all!

```
length = input("Enter rectangle length: )
width = input(Enter rectangle width: ")
area = length * width
perimeter = 2 * length + width
print("Area: + area)
print(f"Perimeter: (perimeter)")
```

Save your corrected code in week4_ex4_2.py

4.3 Snippet 3: Savings Calculator (6 points)

Open the file week4_ex4_3.py. This code has few issues - fix them all!

```
print("Savings Goal Calculator")
goal = float(input("How much do you want to save? Rs. ")
monthly = input("How much can you save per month? Rs. ")
months = goal / monthly
print(f"You will reach your goal in {months} months")
```

Save your corrected code as week4_ex4_3.py

5 Part 5: Creative Coding Challenge (25 points)

Time estimate: 30 minutes

Choose one of the following projects and complete it:

5.1 Option A: Personal Time Capsule

Create an interactive program that collects information about the user and creates a "time capsule" message for their future self.
Open the file week4_ex5_1.py. Replace the blanks with appropriate code:

```
# Time Capsule Creator
print("=== Create Your Digital Time Capsule ===")
print("Answer these questions for your future self!\n")
```

```

# Collect personal information
current_name = input("What is your name? ")
current_age = ___________
favorite_subject = ___________
best_friend = ___________
dream_job = ___________

# Collect numerical data
years_in_future = ___________     # How many years in the future to open
future_age = ___________          # Calculate their future age

# Create the time capsule message using f-strings
print(f"\n{'='*50}")
print(f"TIME CAPSULE FOR: {current_name.upper()}")
print(f"Created: 2024 | To be opened: {2024 + years_in_future}")
print(f"{'='*50}\n")

print(f"Dear Future {current_name},")
print(f"You wrote this when you were {current_age} years old.")
print(f"Now you are {future_age}!")
# Add more creative messages below...
```

Save this code in week4_ex5_1.py

5.2 Option B: Cricket Match Scorer

Open the file week4_ex5_2.py. Replace the blanks to create a program that calculates cricket statistics based on user input:

```
# Cricket Match Statistics Calculator
print("=== Cricket Match Scorer ===")

# Get team and player information
team_name = ___________
player_name = ___________

# Get match statistics
runs_scored = ___________         # Total runs by the player
balls_faced = ___________         # Number of balls faced
fours = ___________               # Number of 4s
sixes = ___________               # Number of 6s

# Calculate statistics
boundaries_runs = (fours * 4) + (sixes * 6)
other_runs = ___________          # Runs not from boundaries
strike_rate = ___________         # (runs/balls) * 100

# Display match summary
print(f"\n=== {player_name} - {team_name} ===")
print(f"Runs Scored: {runs_scored}")
print(f"Balls Faced: {balls_faced}")
print(f"Boundaries: {fours} fours, {sixes} sixes")
# Continue with more statistics...
```

6 Part 6: Reflection Questions (5 points)

Time estimate: 10 minutes
Answer these questions in complete sentences:

1. What was the most challenging part about getting input from users and converting it to the right type? How did you overcome this challenge?

2. Why do you think Python's `input()` function always returns a string, even when the user types numbers?

3. Which string formatting method (commas, +, or f-strings) do you prefer and why?

7 Bonus Section: Extra Challenges (Optional - 10 extra points)

Only attempt if you've finished everything else!

7.1 Challenge 1: Birthday Calculator (5 points)

Open the file `week4_ex7_1.py`. Create a program that calculates interesting facts about someone's age.

1. Ask the user:
   (a) Their name *(string)*
   (b) Their age in years *(integer)*
2. Calculate and display:
   (a) How many months old they are
   (b) How many days old they are *(assume 365 days per year)*
   (c) How many hours old they are
   (d) A fun message like: "Wow `[name]`, you've been alive for `[hours]` hours!"

Sample output:

```
What's your name?  Sara
What's your age in years?  13
--------------------
Wow Sara, you're 13 years old!
That's 156 months
Or about 4,745 days
Or roughly 113,880 hours!
```

7.2 Challenge 2: Shopping Calculator (5 points)

Open the file week4_ex7_2.py. Make a simple bill calculator for a shop:

1. First, ask the user:
   (a) Customer name *(string)*
   (b) Number of notebooks (Rs. 45 each) *(integer)*
   (c) Number of pens (Rs. 15 each) *(integer)*
2. Calculate and display:
   (a) Total cost for notebooks *(float)*
   (b) Total cost for pens *(float)*
   (c) Grand total *(float)*
   (d) A thank you message like: "Thank you `[name]`! Your total is Rs. `[grand total]`."

Sample output:

```
Welcome to Python Store!
Enter your name: Ali
How many notebooks? 3
How many pens? 5
--------------------
Thank you Ali! Your total is Rs. 180.0.
You bought 3 notebooks for Rs. 135.0 and 5 pens for Rs. 75.0.
```

Submission Checklist

Before submitting, make sure you have:

- ☐ Completed all required sections
- ☐ Saved each code exercise in its own file
- ☐ Tested each code file individually to ensure it runs without errors
- ☐ Written your name at the top of this paper
- ☐ Answered all reflection questions
- ☐ Attempted bonus section *(optional)*
- ☐ Compressed your code files into a single zip file named `week4_hw.zip`

Time Tracking:
How long did this homework take you? _____ hours

Parent/Guardian Signature: _____
(Confirming student completed work independently)

Great job making your programs interactive!
Next week: Expressions and Operators