**Name: Muhammad Zaeem**

**ID: S2023266043**

**20 Questions with dictionaries in Python**

# 1. Create a Dictionary with N key-value pairs

n = int(input("Enter number of items in dictionary: "))

d = {}

for i in range(n):

key = input(f"Enter key {i+1}: ")

value = input(f"Enter value for {key}: ")

d[key] = value

print("Created Dictionary:", d)

Enter number of items in dictionary: 5

Enter key 1: Name

Enter value for Name: Zaeem

Enter key 2: ID

Enter value for ID: S2023266043

Enter key 3: City

Enter value for City: Lahore

Enter key 4: Age

Enter value for Age: 21

Enter key 5: Department

Enter value for Department: CS

Created Dictionary: {'Name': 'Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS'}

# 2. Access Value by Key

search\_key = input("Enter key to access value: ")

print("Value:", d.get(search\_key, "Key not found"))

Enter key to access value: Name

Value: Zaeem

# 3. Update Value of a Key

update\_key = input("Enter key to update: ")

if update\_key in d:

new\_val = input("Enter new value: ")

d[update\_key] = new\_val

print("Updated Dictionary:", d)

else:

print("Key not found")

Enter key to update: Name

Enter new value: Muhammad Zaeem

Updated Dictionary: {'Name': 'Muhammad Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS'}

# 4. Add a New Key-Value Pair

new\_key = input("Enter new key: ")

new\_val = input("Enter new value: ")

d[new\_key] = new\_val

print("Dictionary after adding:", d)

Enter new key: Address

Enter new value: Lahore

Dictionary after adding: {'Name': 'Muhammad Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS', 'Address': 'Lahore'}

# 5. Delete a Key-Value Pair

del\_key = input("Enter key to delete: ")

if del\_key in d:

del d[del\_key]

print("Dictionary after deletion:", d)

else:

print("Key not found")

Enter key to delete: Address

Dictionary after deletion: {'Name': 'Muhammad Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS'}

# 6. Check if Key Exists

check\_key = input("Enter key to check: ")

print("Exists?" , check\_key in d)

Enter key to check: Age

Exists? True

# 7. Print All Keys

print("Keys:", list(d.keys()))

Keys: ['Name', 'ID', 'City', 'Age', 'Department']

# 8. Print All Values

print("Values:", list(d.values()))

Values: ['Muhammad Zaeem', 'S2023266043', 'Lahore', '21', 'CS']

# 9. Print All Key-Value Pairs

print("Items:", list(d.items()))

Items: [('Name', 'Muhammad Zaeem'), ('ID', 'S2023266043'), ('City', 'Lahore'), ('Age', '21'), ('Department', 'CS')]

# 10. Get Dictionary Length

print("Number of items:", len(d))

Number of items: 5

# 11. Merge Two Dictionaries

m = int(input("Enter number of items in second dictionary: "))

d2 = {}

for i in range(m):

key = input(f"Enter key {i+1}: ")

value = input(f"Enter value for {key}: ")

d2[key] = value

d.update(d2)

print("Merged Dictionary:", d)

Enter number of items in second dictionary: 3

Enter key 1: make

Enter value for make: honda

Enter key 2: model

Enter value for model: city

Enter key 3: variant

Enter value for variant: sedan

Merged Dictionary: {'Name': 'Muhammad Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS', 'make': 'Toyota', 'model': 'Hulix', 'variant': 'Truck'}

# 12. Find Value with Maximum Length (if values are strings)

if d:

max\_val = max(d.values(), key=len)

print("Longest value:", max\_val)

Longest value: Muhammad Zaeem

# 13. Find Key with Maximum Value (if numeric values)

numeric\_dict = {k:int(v) for k,v in d.items() if str(v).isdigit()}

if numeric\_dict:

max\_key = max(numeric\_dict, key=numeric\_dict.get)

print("Key with maximum numeric value:", max\_key)

Key with maximum numeric value: Age

# 14. Create Dictionary from Two Lists

keys = input("Enter keys separated by space: ").split()

values = input("Enter values separated by space: ").split()

dict\_from\_lists = dict(zip(keys, values))

print("Dictionary from lists:", dict\_from\_lists)

Enter keys separated by space: Name Age make model

Enter values separated by space: Ali 21 honda city

Dictionary from lists: {'Name': 'Ali', 'Age': '21', 'make': 'honda', 'model': 'city'}

# 15. Count Frequency of Characters in a String

s = input("Enter a string: ")

freq = {}

for ch in s:

freq[ch] = freq.get(ch, 0) + 1

print("Character frequencies:", freq)

Enter a string: pakistan zindabad

Character frequencies: {'p': 1, 'a': 4, 'k': 1, 'i': 2, 's': 1, 't': 1, 'n': 2, ' ': 1, 'z': 1, 'd': 2, 'b': 1}

# 16. Count Frequency of Words in a Sentence

sentence = input("Enter a sentence: ").split()

word\_freq = {}

for word in sentence:

word\_freq[word] = word\_freq.get(word, 0) + 1

print("Word frequencies:", word\_freq)

Enter a sentence: a quick brown fox jumps over the lazy dog

Word frequencies: {'a': 1, 'quick': 1, 'brown': 1, 'fox': 1, 'jumps': 1, 'over': 1, 'the': 1, 'lazy': 1, 'dog': 1}

# 17. Swap Keys and Values

swapped = {v:k for k,v in d.items()}

print("Swapped dictionary:", swapped)

Swapped dictionary: {'Muhammad Zaeem': 'Name', 'S2023266043': 'ID', 'Lahore': 'City', '21': 'Age', 'CS': 'Department', 'honda': 'make', 'city': 'model', 'sedan': 'variant'}

# 18. Remove Duplicate Values

unique\_dict = {}

for k,v in d.items():

if v not in unique\_dict.values():

unique\_dict[k] = v

print("Dictionary without duplicate values:", unique\_dict)

Dictionary without duplicate values: {'Name': 'Muhammad Zaeem', 'ID': 'S2023266043', 'City': 'Lahore', 'Age': '21', 'Department': 'CS', 'make': 'honda', 'model': 'city', 'variant': 'sedan'}

# 19. Find Common Keys Between Two Dictionaries

common\_keys = set(d.keys()) & set(d2.keys())

print("Common keys:", common\_keys)

Common keys: {'make', 'variant', 'model'}

# 20. Nested Dictionary Example

students = {}

num\_students = int(input("Enter number of students: "))

for i in range(num\_students):

name = input("Enter student name: ")

age = int(input(f"Enter {name}'s age: "))

grade = input(f"Enter {name}'s grade: ")

students[name] = {"age": age, "grade": grade}

print("Nested Dictionary:", students)

Enter number of students: 7

Enter student name: A

Enter A's age: 21

Enter A's grade: B+

Enter student name: B

Enter B's age: 22

Enter B's grade: B-

Enter student name: C

Enter C's age: 20

Enter C's grade: A+

Enter student name: D

Enter D's age: 21

Enter D's grade: D

Enter student name: E

Enter E's age: 22

Enter E's grade: B+

Enter student name: F

Enter F's age: 23

Enter F's grade: F

Enter student name: G

Enter G's age: 19

Enter G's grade: A+

Nested Dictionary: {'A': {'age': 21, 'grade': 'B+'}, 'B': {'age': 22, 'grade': 'B-'}, 'C': {'age': 20, 'grade': 'A+'}, 'D': {'age': 21, 'grade': 'D'}, 'E': {'age': 22, 'grade': 'B+'}, 'F': {'age': 23, 'grade': 'F'}, 'G': {'age': 19, 'grade': 'A+'}}