

Weekly Homework — Week 03, Term 1

PM3 Homework — Data Structures Practice

Programming Module 3 | Applied Computing Australia

Name

Date

Part A: Predict the Output

What will each code snippet print? Write your answer before checking. Trace through the code line by line.

Tip: run the code in Python to check your predictions after completing this section.

A1. List creation and indexing

```
panels = ["SunPower", "Jinko", "LONGi", "QCells"]
print(panels[0])
print(panels[-1])
print(len(panels))
```

Output:

A2. append and remove

```
brands = ["SunPower", "Jinko", "LONGi"]
brands.append("Trina")
brands.remove("Jinko")
print(brands)
print(len(brands))
```

Output:

A3. for loop over a list

```
prices = [450, 280, 320]
for price in prices:
    print(f"Panel costs ${price}")
```

Output:

A4. Dictionary access with bracket notation

```
panel = {"brand": "SunPower", "watts": 440, "price": 450}
print(panel["brand"])
print(panel["watts"])
```

Output:

A5. dict.get() with default value

```
panel = {"brand": "SunPower", "watts": 440}
print(panel.get("watts"))
print(panel.get("warranty"))
print(panel.get("warranty", "Not specified"))
```

Output:

A6. Iterating dict with .items()

```
system = {"size_kw": 6.6, "panels": 16, "cost": 5400}
for key, value in system.items():
    print(f"{key}: {value}")
```

Output:

A7. List of dicts — loop and access

```
panels = [
    {"brand": "SunPower", "watts": 440},
    {"brand": "Jinko", "watts": 420},
    {"brand": "LONGi", "watts": 430},
]
for panel in panels:
    print(f"{panel['brand']} - {panel['watts']}W")
```

Output:

A8. Tricky — index after remove

```
installers = ["SolarQuotes", "Sunrun", "GreenEnergy", "EcoSolar"]
installers.remove("Sunrun")
print(installers[1])
print(installers[-1])
```

Output:

Part B: Find the Error

Each snippet has a bug. Identify the error and explain the fix.

B1. Find the bug

```
panel = {"brand": "SunPower", "watts": 440}
print(panel["price"])
```

Error:

Fix:

B2. Find the bug

```
panels = ["SunPower", "Jinko", "LONGi"]
print(panels[3])
```

Error:

Fix:

B3. Find the bug

```
shortlist = []
shortlist = "SunPower"
shortlist = "Jinko"
print(shortlist)
```

Error:

Fix:

B4. Find the bug

This code causes extra blank lines in the CSV file on some systems. What is missing?

```
import csv
with open("panels.csv", "w") as file:
    writer = csv.writer(file)
    writer.writerow(["brand", "watts"])
    writer.writerow(["SunPower", 440])
```

Error:

Fix:

B5. Find the bug

```
import csv
with open("panels.csv", "r") as file:
    reader = csv.DictReader(file)
    for row in reader:
        if row["watts"] > 400:
            print(row["brand"])
```

Error:

Fix:

B6. Find the bug

```
file = open("solar_log.txt", "w")
file.write("Installation started\n")
file.write("Panels mounted\n")
# oops, forgot something!
```

Error:

Fix:

Part C: Fill in the Blanks

Complete the code by filling in each blank (____).

C1. Building a list of dicts from user input

```
panels = []
for i in range(3):
    brand = input("Enter brand: ")
    watts = int(input("Enter watts: "))
    panel = {"brand": brand, ____: watts}
    panels.__(panel)
print(f"Added {len(panels)} panels")
```

Answers:

C2. Reading a CSV file with DictReader

```
import csv
with open("panels.csv", ____) as file:
    reader = csv.__(file)
    for row in reader:
        print(row["brand"], row["watts"])
```

Answers:

C3. Writing to a file with with open

```
quotes = ["6.6 kW - $5400", "10 kW - $8200", "13.2 kW - $10800"]
with open("quotes.txt", ____) as file:
    for quote in quotes:
        file.write(quote + ____)
```

Answers:

C4. Filtering a list of dicts

```
panels = [
    {"brand": "SunPower", "watts": 440, "price": 450},
    {"brand": "Jinko", "watts": 420, "price": 280},
    {"brand": "LONGi", "watts": 430, "price": 320},
]
premium = []
for panel in ____:
    if panel[____] >= 430:
        premium.append(____)
print(f"Found {len(premium)} premium panels")
```

Answers:

Part E: Data Structure Matching Table

Use this to confirm your understanding of the key terms from this module. Match each concept on the left with its description on the right. Write the letter in the space.

Concept	Your answer	Letter	Description
list		A	Returns value for a key, or a default if missing
dictionary		B	Adds an item to the end of a list
key		C	Reads CSV rows as dictionaries using column headers
value		D	An ordered, changeable collection using square brackets
index		E	Automatically closes a file when the block ends
append()		F	The data stored under a key in a dictionary
DictReader		G	A numeric position of an item in a list (starts at 0)
.items()		H	A collection of key-value pairs using curly braces
.get()		I	The name used to look up a value in a dictionary
with statement		J	Returns all key-value pairs as tuples for looping