Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

## Assessment type (☑):

☐ Questioning (Oral/Written)
☐ Practical Demonstration
☐ 3rd Party Report
☒ Other – Lab

## Assessment Resources:

The base requirements this assessment task include:

- IDE or editor for developing Python programs *(only IDLE and PyCharm supported by the college)*
- Access to Office 365 & Microsoft Word
- Virtual machine

*You may not need all these for every part in this assessment*

## Assessment Due :

This assessment is due after the weekly session, **Week 9, Friday 17:00**.

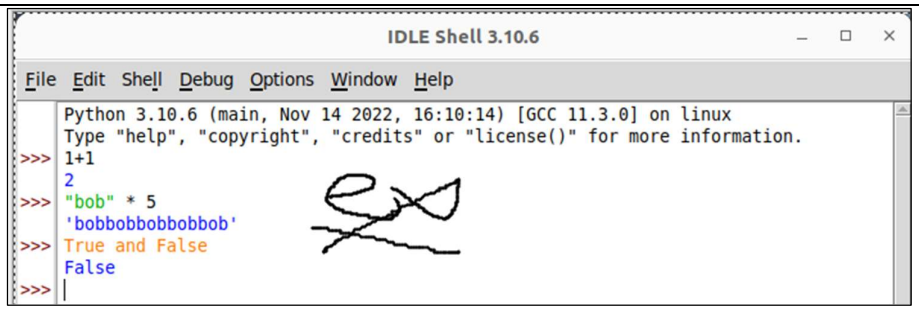
## Assessment Instructions:

1. Your code must be written in IDLE or PyCharm IDEs. If you are using a different IDEs or a different structure for your application, then assistance from your lecturers may be limited (at best). Discuss with your lecturer before straying too far off the path!
2. All resources used should be referenced with the question. Answers may not be copied and pasted from any resource. All answers must be reworded to display your understanding.
3. You may only use Python functionality, methods and libraries which were taught in this unit.
4. First line of code in a program should have the student's name and number, as proof of authenticity.
5. Screenshots of all programs must be included **in** this document, with the appropriate question.
6. Screenshots of testing, showing your code works as intended, should be included with the relevant question.
7. Python programs should be named: XXX_Lab##_SYY_QZZ
   Replace XXX with your initials
   Replace ## with Lab number
   Replace YY with Section number,
   Replace ZZ with Question number
8. It is a submission requirement that all screen shots be signed in some way. Some acceptable examples of signed screen shots are shown below.

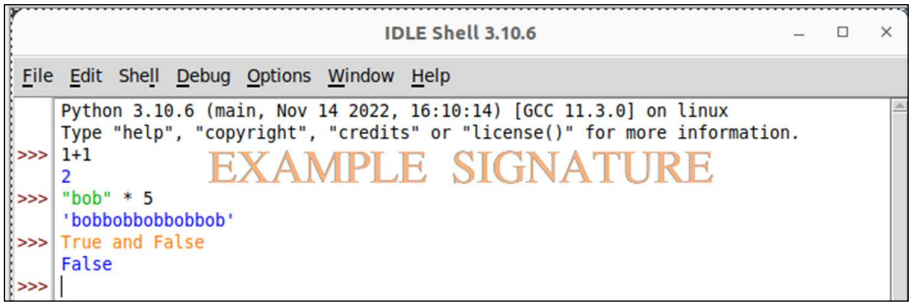
Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

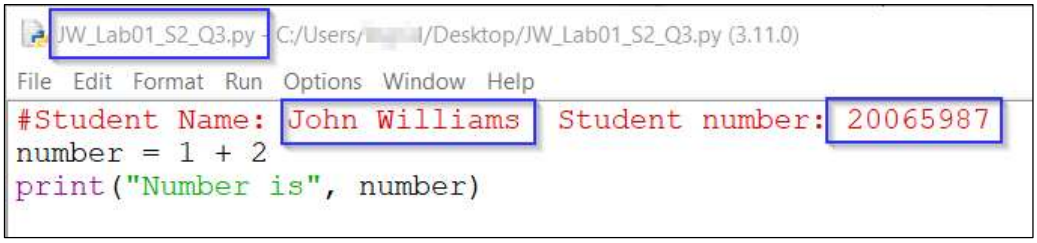
| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |




**Example 1**: Signed using a simple drawing tool.




**Example 2**: Water marked signature.




**Example 3**: Program named as prescribed, as well as first line comment with student name and number. Program saved as pre-described.

9. All python programs must be included in the submission, as well as this document.

## Assessment Instrument:

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

## Section 1: Defining dictionaries

Begin by answering the following questions about dictionaries.

1. What is a dictionary?

In Python dictionaries are used to store data values in key:value pairs.
A dictionary is a collection which is ordered and changeable.

2. What makes dictionaries different to lists?

Dictionaries doesn't allow duplicate values and are written with curly brackets.

3. Can dictionaries contain lists?

Yes

4. What are two ways you can create a dictionary using Python?

By using the constructor
thisdict = dict(name = "John", age = 36, country = "Norway")
Or, key: value pairs surrounded by curly brackets
thisdict = { name: "John", age: 36, country: "Norway"}

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

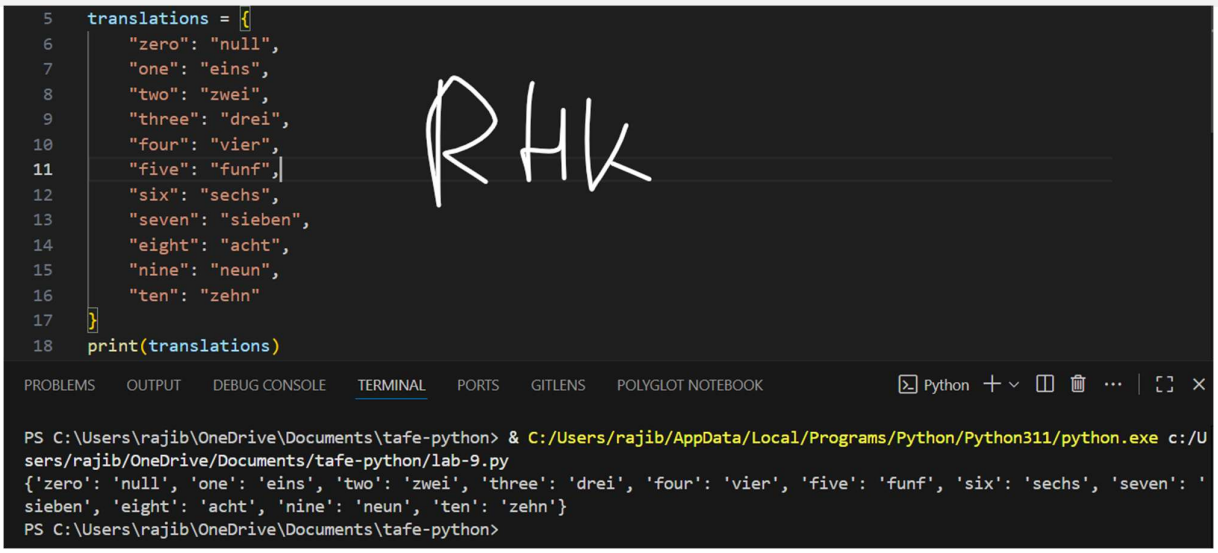
## Section 2: Working with a simple dictionary

Complete the following tasks using the interpreter.

1. Create a dictionary called **translations** and assign the following key/value pairs to it.

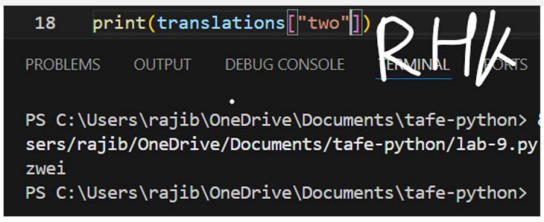
```
translations={"zero":"null","one":"eins","two":"zwei","three":"drei","four":"vier","five":"funf
","six":"sechs","seven":"sieben","eight":"acht","nine":"neun","ten":"zehn"}
```

2. Print the complete dictionary.




3. Print the value for the key **two** from the dictionary using square brackets.

```
translations["two"]
'zwei'
```




4. Print all items in dictionary as tuples, e.g.

```
('zero', 'null')
('one', 'eins')
```

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

```
19  for key, value in translations.items():
20      print((key, value))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> &
sers/rajib/OneDrive/Documents/tafe-python/lab-9.py
('zero', 'null')
('one', 'eins')
('two', 'zwei')
('three', 'drei')
('four', 'vier')
('five', 'funf')
('six', 'sechs')
('seven', 'sieben')
('eight', 'acht')
('nine', 'neun')
('ten', 'zehn')
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

5. Print only the **keys** in the dictionary

```
19  print(translations.keys())
20
```

RHK

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS POLYGLOT NOTEBOOK Python

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppData/Local/Programs/Python/Py
sers/rajib/OneDrive/Documents/tafe-python/lab-9.py
dict_keys(['zero', 'one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight', 'nine', 'ten'])
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

6. Print only the **values** in the dictionary.

```
19  print(translations.values())
```

RHK

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS POLYGLOT NOTEBOOK Python

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppData/Local/Programs/Python/Python3
sers/rajib/OneDrive/Documents/tafe-python/lab-9.py
dict_values(['null', 'eins', 'zwei', 'drei', 'vier', 'funf', 'sechs', 'sieben', 'acht', 'neun', 'zehn'])
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

7. Add the key value pairs **“twenty”:”zwanzig”** and **“twenty one”:”ienundzwanzig”** to the dictionary.
8. Remove the key pair **“zero”:”null”** from the key pair
9. Print the dictionary one last time.

**Output**

```
19  translations.pop("zero")
20  translations.update({
21      "twenty": "zwanzig",
22      "twenty one": "ienundzwanzig"
23  })
24  print(translations)
```

RHK

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS POLYGLOT NOTEBOOK Python

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppData/Local/Programs/Python/Python311/python.exe c:/U
sers/rajib/OneDrive/Documents/tafe-python/lab-9.py
{'one': 'eins', 'two': 'zwei', 'three': 'drei', 'four': 'vier', 'five': 'funf', 'six': 'sechs', 'seven': 'sieben', 'eight'
: 'acht', 'nine': 'neun', 'ten': 'zehn', 'twenty': 'zwanzig', 'twenty one': 'ienundzwanzig'}
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

## Section 3: Nested dictionaries

Complex dictionaries can be made from any number of components (including other dictionaries), particularly when automating data input from one application to another. Complete the following tasks using a code file.

Open the code file "**games.py**" from BlackBoard and complete each of the challenges in the python file. Your goal is to demonstrate you can work with the nested dictionaries by extracting the required data and formatting it in the exact way presented by the demo screen shots.

*To be marked as satisfactory for this section, you must provide:*

a. Your own screen shots matching the examples.
b. Screenshots as well as your final code in a code file.
c. Your final JSON file.

1. Challenge 1: Print all game names using a loop.

```
--- 1! ---
Game 1 is: McPixel
Game 2 is: Dune: Spice Wars
Game 3 is: Door Kickers: Action Squad
Game 4 is: Super Amazing Wagon Adventure
Game 5 is: Sniper Elite 4
Game 6 is: Duck Game
Game 7 is: South Park™: The Fractured But Whole™
Game 8 is: Risk of Rain 2
Game 9 is: Nidhogg
Game 10 is: Persona® 5 Strikers
Game 11 is: Marvel's Spider-Man Remastered
```

**Code**

```
19  counter = 0
20  for x in games.values():
21      counter += 1
22      print(f"Game {counter} is: {x['name']}")
23
```

RHK

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/
Users/rajib/OneDrive/Documents/tafe-python/Lab 09 - Games.py"

--- 1! ---
Game 1 is: McPixel
Game 2 is: Dune: Spice Wars
Game 3 is: Door Kickers: Action Squad
Game 4 is: Super Amazing Wagon Adventure
Game 5 is: Sniper Elite 4
Game 6 is: Duck Game
Game 7 is: South Park™: The Fractured But Whole™
Game 8 is: Risk of Rain 2
Game 9 is: Nidhogg
Game 10 is: Persona® 5 Strikers
Game 11 is: Marvel's Spider-Man Remastered
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

2. Print the name and cost of all games that cost less than 50 dollars.

```
--- 2! ---
McPixel costs 6.99 AUD.
Dune: Spice Wars costs 44.99 AUD.
Door Kickers: Action Squad costs 19.95 AUD.
Super Amazing Wagon Adventure costs 4.5 AUD.
Duck Game costs 18.5 AUD.
Risk of Rain 2 costs 35.95 AUD.
Nidhogg costs 14.5 AUD.
```

**Code**

```
26  for x in games.values():
27      if x['price'] < 50:
28          print(f"{x['name']} costs {x['price']} AUD.")
```

RHK

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib
Users/rajib/OneDrive/Documents/tafe-python/Lab 09 - Games.py"

--- 2! ---
McPixel costs 6.99 AUD.
Dune: Spice Wars costs 44.99 AUD.
Door Kickers: Action Squad costs 19.95 AUD.
Super Amazing Wagon Adventure costs 4.5 AUD.
Duck Game costs 18.5 AUD.
Risk of Rain 2 costs 35.95 AUD.
Nidhogg costs 14.5 AUD.
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

3. Print the details of the game with the ID **312530**.

```
--- 3! ---
Game 312530 is: Duck Game
It was released in: 5 Jun 2015
URL: https://store.steampowered.com/app/312530/Duck_Game/
Price: 18.5 AUD
Tag: Multiplayer
Tag: Funny
Tag: Pixel Graphics
Tag: Action
Tag: 2D
```

**Code**

```
print("\n--- 3! ---")
for x, y in games.items():
    if x == 312530:
        print(f"Game {x} is: {y['name']}")
        print(f"It was released in: {y['release date']}")
        print(f"URL: {y['url']}")
        print(f"Price: {y['price']} AUD")
        for z in y['tags']:
            print(f"Tag: {z}")
```

RHK

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/
Users/rajib/OneDrive/Documents/tafe-python/Lab 09 - Games.py"

--- 3! ---
Game 312530 is: Duck Game
It was released in: 5 Jun 2015
URL: https://store.steampowered.com/app/312530/Duck_Game/
Price: 18.5 AUD
Tag: Multiplayer
Tag: Funny
Tag: Pixel Graphics
Tag: Action
Tag: 2D
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

4. Find and display all the games with the tag “Action” using a nested loop.

```
--- 4! ---
Door Kickers: Action Squad Tags: ['Pixel Graphics', 'Action', 'Co-op', 'Indie', 'Tactical']
Super Amazing Wagon Adventure Tags: ['Indie', 'Action', 'Action Rougelike', 'Adventure', '2D']
Sniper Elite 4 Tags: ['Sniper', 'Action', 'Multiplayer', 'Shooter', 'War']
Duck Game Tags: ['Multiplayer', 'Funny', 'Pixel Graphics', 'Action', '2D']
Nidhogg Tags: ['Local Multiplayer', 'Fighting', 'Action', 'PvP']
Marvel's Spider-Man Remastered Tags: ['Superhero', 'Action', 'Open World', 'Singleplayer']
```

**Code**

```
for x, y in games.items():
    for z in y['tags']:
        if z == "Action":
            print(f"{y['name']} Tags: {y['tags']}")
```

RHK .

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppData/Local/Programs/Python/
Users/rajib/OneDrive/Documents/tafe-python/Lab 09 - Games.py"

--- 4! ---
Door Kickers: Action Squad Tags: ['Pixel Graphics', 'Action', 'Co-op', 'Indie', 'Tactical']
Super Amazing Wagon Adventure Tags: ['Indie', 'Action', 'Action Rougelike', 'Adventure', '2D']
Sniper Elite 4 Tags: ['Sniper', 'Action', 'Multiplayer', 'Shooter', 'War']
Duck Game Tags: ['Multiplayer', 'Funny', 'Pixel Graphics', 'Action', '2D']
Nidhogg Tags: ['Local Multiplayer', 'Fighting', 'Action', 'PvP']
Marvel's Spider-Man Remastered Tags: ['Superhero', 'Action', 'Open World', 'Singleplayer']
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

5. Change the price of any game the user wishes to change to any value a user wants to input. Ensure you preserve data types and display the new game information to confirm.

```
--- 5! ---
Enter the ID of the game to set the new price for: 312530
Enter the new price: 19.99
The game: Duck Game now costs 19.99
```

**Code**

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

```
gameId = input("Enter the ID of the game to set the new price for: ")
gameIdList = list(games.keys())
if gameId.isnumeric() and gameIdList.count(int(gameId)) > 0:
    newPrice = input("Enter the new price: ")
    if newPrice.isdigit() or (newPrice.split(".")[0].isdigit() and newPrice.split(".")[1].isdigit()):
        games[int(gameId)]["price"] = float(newPrice)
        print(
            f'The game: {games[int(gameId)]["name"]} now costs {games[int(gameId)]["price"]}')
    else:
        print("You enetered an invalid price.")
else:
    print("The ID of the game doesn't match!")
```

RHK

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppDat
Users/rajib/OneDrive/Documents/tafe-python/Lab 09 - Games.py"
Enter the ID of the game to set the new price for: 312530
Enter the new price: 19.99
The game: Duck Game now costs 19.99
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK

6. Add the following code to the file to save the information in a structured JSON file.

```
# Challenge 6: Save the data in JSON
import json
file = open("games.json","w")
json.dump(games,file,indent=1)
file.close()
print("Saved!")
```

7. Run your complete program and verify the data was saved to the JSON file (relative pathing is used in the JSON file path, so it should save to the same location as the script you are working with).

Open ▾ games.json ~/Desktop

```
{
 "220860": {
  "name": "McPixel",
  "release date": "26 Sep 2012",
  "url": "https://store.steampowered.com/app/220860/McPixel/",
  "price": 6.99,
  "tags": [
   "Point & Click",
   "Comedy",
   "Indie",
   "Pixel Graphics"
  ]
 },
 "1605220": {
  "name": "Dune: Spice Wars",
  "release date": "26 Apr 2022",
  "url": "https://store.steampowered.com/app/1605220/Dune_Spice_Wars/",
  "price": 44.99,
  "tags": [
```

| **Code** | **Output** |
|---|---|

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

Government of Western Australia
North Metropolitan TAFE

# Assessment Task: Lab 9

| | |
|---|---|
| **Qualification national code and title** | 22603VIC Certificate IV in Cybersecurity |
| **Unit/s national code/s and title/s** | **ICTPRG434 - Automate processes**<br>**ICTPRG435 - Write script for software applications** |

## Section 4: JSON

Answer the following questions and complete the following tasks. Supporting documentation can be found here.

1. What is **JSON**?

Mostly used for data transfer between web servers and web applications, JSON (JavaScript Object Notation) is a text-based, human-readable format for storing and sharing structured data. It can also be used to store unstructured data.

2. What are the advantages to saving data in the JSON format?

JSON data storage has several benefits, including being self-describing and human-readable, which makes debugging and development easier, and being lightweight and space-saving, which makes it perfect for speedier data transmission.

3. What is **YAML** and **XML**?

**YAML:** A human-readable data serialization language, YAML is meant to be simple to read and write.

**XML:** Like HTML, XML is a markup language that defines elements and their structure using tags.

4. Create a new code file called **games2.py**. The code file should:
   a. Open the JSON file saved from the last section.
   b. Read all the data in JSON format.
   c. Import the JSON data back into a dictionary exactly as it was saved.
   d. Print the data back (no formatting required), just verification the data was read and is the correct type.

**Code**

games2.py U

```
import json

games = None

with open("games.json", "r") as file:
    games = json.load(file)

print(games)
```

RHK

**Output**

```
PS C:\Users\rajib\OneDrive\Documents\tafe-python> & C:/Users/rajib/AppData/Local/Programs/Python/Python311/python.exe c:/Users/rajib/OneDrive/Documents/tafe-python/games2.py
{'220860': {'name': 'McPixel', 'release date': '26 Sep 2012', 'url': 'https://store.steampowered.com/app/220860/McPixel/', 'price': 6.99, 'tags': ['Point & Click', 'Comedy', 'Indie', 'Pixel Graphics']}, '1605220': {'name': 'Dune: Spice Wars', 'release date': '26 Apr 2022', 'url': 'https://store.steampowered.com/app/1605220/Dune_Spice_Wars/', 'price': 44.99, 'tags': ['Economy', 'Diplomacy', 'Political', 'Building', '4X']}, '686200': {'name': 'Door Kickers: Action Squad', 'release date': '11 Sep 2018', 'url': 'https://store.steampowered.com/app/686200/Door_Kickers_Action_Squad/', 'price': 19.95, 'tags': ['Pixel Graphics', 'Action', 'Co-op', 'Indie', 'Tactical']}, '250500': {'name': 'Super Amazing Wagon Adventure', 'release date': '16 Oct 2013', 'url': 'https://store.steampowered.com/app/250500/Super_Amazing_Wagon_Adventure/', 'price': 4.5, 'tags': ['Indie', 'Action', 'Action Rougelike', 'Adventure', '2D']}, '312660': {'name': 'Sniper Elite 4', 'release date': '14 Feb 2017', 'url': 'https://store.steampowered.com/app/312660/Sniper_Elite_4/', 'price': 84.95, 'tags': ['Sniper', 'Action', 'Multiplayer', 'Shooter', 'War']}, '312530': {'name': 'Duck Game', 'release date': '5 Jun 2015', 'url': 'https://store.steampowered.com/app/312530/Duck_Game/', 'price': 19.99, 'tags': ['Multiplayer', 'Funny', 'Pixel Graphics', 'Action', '2D']}, '488790': {'name': 'South Park™: The Fractured But Whole™', 'release date': '18 Oct 2017', 'url': 'https://store.steampowered.com/app/488790/South_Park_The_Fractured_But_Whole/', 'price': 89.95, 'tags': ['RPG', 'Comedy', 'Dark Humor', 'Funny', 'Superhero']}, '632360': {'name': 'Risk of Rain 2', 'release date': '18 Oct 2017', 'url': 'https://store.steampowered.com/app/632360/Risk_of_Rain_2/', 'price': 35.95, 'tags': ['Third-Person Shooter', 'Action Rougelike', 'Multiplayer']}, '94400': {'name': 'Nidhogg', 'release date': '14 Jan 2014', 'url': 'https://store.steampowered.com/app/94400/Nidhogg/', 'price': 14.5, 'tags': ['Local Multiplayer', 'Fighting', 'Action', 'PvP']}, '1382330': {'name': 'Persona® 5 Strikers', 'release date': '23 Feb 2021', 'url': 'https://store.steampowered.com/app/1382330/Persona_5_Strikers/', 'price': 99.95, 'tags': ['Anime', 'Great Soundtrack', 'JRPG', 'Hack and Slash']}, '1817070': {'name': 'Marvel's Spider-Man Remastered', 'release date': '12 Aug 2022', 'url': 'https://store.steampowered.com/app/1817070/Marvels_SpiderMan_Remastered/', 'price': 94.95, 'tags': ['Superhero', 'Action', 'Open World', 'Singleplayer']}}
PS C:\Users\rajib\OneDrive\Documents\tafe-python>
```

RHK