Grade 9 Computing

Unit 3 · Python: Lists, Strings and Dictionaries

WORKSHEET

Full marks 38

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 38

1 Key words [4]

Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

append	CSV	dictionary	immutable	index	key	KeyError	list	slice	tuple

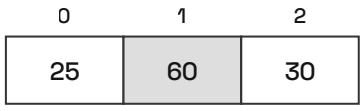
A _____ keeps its items in order, each at a position called its _____, counting from 0. A _____, such as `city[2:5]`, takes a piece of a string or a list. A string can't be changed once it is made: it is _____. A _____ holds pairs and finds each value by its _____. Reading a key that isn't there stops the program with a _____. A _____, such as `("Bagmati", 13)`, is a sequence in round brackets that can't be changed either.

2 Label the diagram [2]

The diagram shows the same three prices kept in a list and in a dictionary. Write the word or the Python expression that belongs in place of 1 to 4. Each carries 0.5 mark.

A list: items by position

prices = [25, 60, 30]

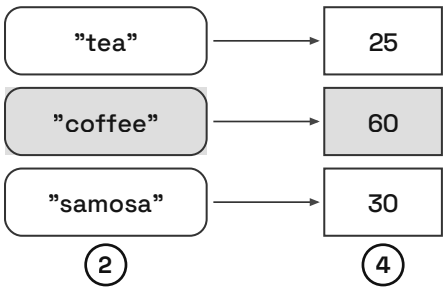


(1)

60 is at position 1, but the list doesn't say what it is the price of.

A dictionary: values by key

menu = {"tea": 25, "coffee": 60, ...}



(3)

1. _____ 2. _____

3. _____ 4. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. What is `"Pokhara"[1:4]`? [1]

a. `"Pok"` **b.** `"okh"`

c. `"okha"` **d.** `"kha"`

ii. What does `"a b  c".split()` give? [1]

a. `['a b  c']` **b.** `['a', 'b', '', 'c']`

c. `['a', 'b', 'c']` **d.** `'abc'`

iii. `stock = {"pens": 40, "copies": 25}`. What does `stock.get("rulers", 0)` give? [1]

a. a KeyError **b.** 0

c. `None` **d.** 25

iv. A program keeps a diary in `diary.txt`. Each day it must add that day's line without losing the days before. How should it open the file? [1]

a. `open("diary.txt", "w")` **b.** `open("diary.txt", "a")`

c. `open("diary.txt", "r")` **d.** `open("diary.txt", "x")`

v. A program must remember each district's headquarters, and find it from the district's name. Which is best? [1]

a. two lists, one of districts and one of headquarters

b. a dictionary, key the district, value its headquarters

c. a string with all the names

d. a tuple of the headquarters

4 What does it print? [7]

Write exactly what each program prints, in the box under it.

a. [2]

```
1  nums = [4, 7, 1]
2  nums.append(9)
3  nums.insert(1, 5)
4  x = nums.pop()
5  nums.remove(7)
6  print(nums, x)
```

```
OUTPUT
```

b. [2]

```
1  city = "Bhaktapur"
2  print(city[:4], city[-3:])
3  print(city.upper().count("A"))
```

```
OUTPUT
```

c. [3]

```
1  menu = {"tea": 25, "coffee": 60}
2  menu["momo"] = 150
3  menu["tea"] = 30
4  for item, price in menu.items():
5      if price < 100:
6          print(item, price)
7  print(len(menu), "momo" in menu, 150 in menu)
```

```
OUTPUT
```

5 Trace the program [4]

Fill in the trace table: one row for each time round the loop, then what the program prints. The first row shows the values before the loop.

```
1  rain = [0, 12, 30, 5]
2  total = 0
3  wet = []
4  for r in rain:
5      total = total + r
6      if r > 10:
7          wet.append(r)
8  print(total, wet)
```

r	total	wet	Output
(before)	0	[]	

6 Find and fix the bug [3]

Read the program, then answer.

This program should count how many times each word comes in the text, but it stops with an error.

```
1  text = "the tea is hot and the momo is hot"
2  counts = {}
3  for w in text.split():
4      counts[w] = counts[w] + 1
5  print(counts)
```

i. Which line stops the program, and with which error?
ii. Why does it happen?
iii. Write the corrected line.

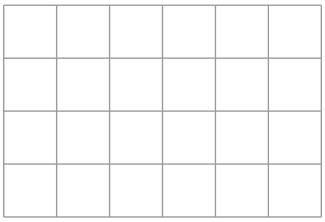
7 A photo as numbers [3]

Read the program, then answer.

photo is a tiny black-and-white picture, 4 rows of 6 pixels: 0 is black and 255 is white.

```
photo = [
    [255, 255, 0, 0, 255, 255],
    [255, 0, 0, 0, 0, 255],
    [0, 0, 0, 0, 0, 0],
    [255, 0, 255, 255, 0, 255],
]
new = []
for r in range(len(photo)):
    row = []
    for c in range(len(photo[0])):
        row.append(255 - photo[len(photo) - 1 - r][c])
    new.append(row)
print(new[0])
```

i. Draw **new** on the squares, a square for each pixel: shade the ones that are black (0).



ii. Write what the program prints.

```
OUTPUT

_____
```

8 Write a program [4]

Write the program in Python on the lines. Any program that gives the right result gets the marks.

Write a program that asks for a sentence, then prints how many words it has, its longest word, and the sentence with its words in reverse order. For we climbed to the top of Nagarkot it should print `7 words`, `Longest: Nagarkot` and `Nagarkot of top the to climbed we`.

9 Short answers [4]

Write short answers to the following questions.

a. Choose a data structure for each job, and give a reason: i. the songs of a playlist, played in order; ii. each district's headquarters, found by the district's name. [2]

b. After `a = [52, 38]`, `b = a` and `b.append(71)`, printing `a` shows `[52, 38, 71]`. Why did `a` change? How could `b` be made a separate list? [2]

10 Think [2]

Think, then answer.

A teacher keeps a class's records as two lists, `names = ["Asha", "Bimal"]` and `marks = [72, 58]`. Why is one dictionary, `{"Asha": 72, "Bimal": 58}`, or one list of rows better? Give two reasons.

11 Activity: A word counter (not marked)

At a computer, open the unit's page (the QR code) and find the activity **A word counter**. Put in a paragraph from your English book, then one from your Nepali book, and fill in the table.

Paragraph	Different words	Most common word, and how many times	Words that come 3 times or more
from my English book			
from my Nepali book			
a paragraph of my own			