

Answers to Questions and Exercises

This document contains answers to in-text questions and exercises in the book ***Learning to Program in Python*** by PM Heathcote.

The Python programs referred to in the text and in this Answers document are all in a separate folder within this pack.

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Answers

Chapter 1 – Data types, operators and I-O

# In-text questions

**Q1:** (a) Console.WriteLine(10 \* 6 + 5 \* 3)

75

(b) Console.WriteLine(10 \* (6 + 5) \* 3)

330

(c) Console.WriteLine(33 mod 7)

5

**Q2:** Console.WriteLine(Math.Round((6.7 / 3), 3))

2.233

**Q3:** (a) highScore = 25

(b) playerName = "Davina"

(c) height = 4.5

base = 6

Console.WriteLine((base \* height) / 2)

**Q4:** (a) counter += 1

(b) housePrice \*= 2

(c) hits -= penalty

(d) totalCostOfMeal /= 3

**Q5:** (a) Console.WriteLine("More pain, more gain")

(b) Console.WriteLine("That's true!")

(c) Console.WriteLine("Pelham" & "123")

(d) How will this statement be printed?

# Exercises

1. (a) Console.Write("Enter favourite food: ")

Dim food = Console.ReadLine()

Console.Write("Enter favourite colour: ")

Dim colour = Console.ReadLine()

Console.WriteLine("My favourite food is " + food + " and my favourite colour is " + colour)

Enter favourite food: peanut butter

Enter favourite colour: blue

My favourite food is peanut butter and my favourite colour is blue

(b) Console.WriteLine("My favourite food is " & food & " and my favourite colour is " & colour)

My favourite food is peanut butter and my favourite colour is blue

2. (a) Console.Write("Please enter your name: ")

Dim Name = Console.ReadLine()

Console.Write("Please enter your telephone number: ")

Dim Telephone = Console.ReadLine()

Console.WriteLine(Name & vbCrLf & vbCrLf & Telephone)

Jo

01227 342567

(b) Console.WriteLine(Name & vbTab & Telephone)

3. (a) Console.WriteLine(40 \ 11)

3

(b) Console.WriteLine(40 Mod 11)

7

(c) Console.WriteLine(2 ^ 10)

1024

(d) Console.WriteLine("three" > "two")

False (Note that this evaluated alphabetically rather than numerically.)

(e) Console.WriteLine("abc" < "ABC")

False

(f) Console.WriteLine(1 <= 4 And 7 <= 7)

True

(g) Console.WriteLine("Fred" <> "fred")

True

Chapter 2 – Strings and numbers

# In-text questions

**Q1**: “‘Le’ not declared” – the function name is misspelt

Console.WriteLine("The string length is: " & Len(aString))

“) expected” – there is a missing end bracket

Console.WriteLine("The string length is: " & Len(aString))

# Exercises

1. See VB program Ch 2 Exercise 1 string methods.txt

2. See VB program Ch 2 Exercise 2 radius and circumference.txt

3. See VB program Ch 2 Exercise 3 rounding floating point numbers.txt

Chapter 3 – Selection

# In-text questions

**Q1:** See VB program Ch 3 Question 1 minimum number.txt

Dim num1, num2, minimum As Double

Console.WriteLine("Enter first number: ")

num1 = Console.ReadLine()

Console.WriteLine("Enter second number: ")

num2 = Console.ReadLine()

If num1 < num2 Then

    minimum = num1

Else

    minimum = num2

End If

Console.WriteLine("Minimum number = " & minimum)

**Q2:** weekendRate will remain False.

See VB program Ch 3 Example 4 Selection statements.txt

# Exercises

1. See VB program Ch 3 Exercise 1 area of square or rectangle.txt

2. See VB program Ch 3 Exercise 2 menu of subject choices.txt

3. See VB program Ch 3 Exercise 3 throw two dice.txt

4. See VB program Ch 3 Exercise 4 discount on goods purchased.txt

5. See VB program Ch 3 Exercise 5 car parking charges.txt

Chapter 4 – Iteration

# In-text questions

**Q1:** (a) See VB program Ch 4 Question 1a Lift-off.txt

(b) See VB program Ch 4 Question 1b total and average.txt

**Q2:** The maximum result would be correct so long as all the results are 100 or less. The minimum result would be given as -1.

See VB program Ch 4 Question 2 max and min error.txt

**Q3:** Strange results can occur. For instance, if the numbers 8, 2 and 61 are entered, then Maximum test result will be 8 and Minimum test result will be 2. This is because “61” is less than “8” in a string comparison.

See VB program Ch 4 Question 3 max and min with string input.txt

**Q4:** See VB program Ch 4 Question 4 max and min no results entered.txt

**Q5:** See VB program Ch 4 Question 5 find vowels.txt

# Exercises

1. See VB program Ch 4 Exercise 1 10 random numbers.txt

2. See VB program Ch 4 Exercise 2 1000 sets of 10 random numbers.txt

The answer should be close to 55. Overall, each of the numbers 1-10 should be generated with the same frequency. The total of the numbers 1 to 10 is 55, so the average total of all the numbers will be close to this. Try it with 10,000 sets of numbers – it should be even closer. Obtaining an answer to a question like “What is the total of the numbers 1-10?” using this method is called the Monte Carlo method, and is a useful technique to find answers to questions for which there is no obvious formula.

3. See VB program Ch 4 Exercise 3 product codes.txt  
  
Output for the test data should be:  
(for CD222), Invalid code – must start with AB or AS  
Total codes starting with ‘AB’ = 3  
Total codes starting with ‘00’ = 1

Chapter 5 – Arrays and tuples

# In-text questions

**Q1:** The program will output the first six names and then crash with an “index out of range” error as there is no name(6) (Arrays start with the first element being 0)

**Q2:** monthlyAvg(10, 1)

**Q3:** Console.WriteLine("December max: " & monthlyAvg(11, 0) & ", min: "   
& monthlyAvg(11, 1))

**Q4:** 2 – This is the number of columns in the array.

# Exercises

1. (a) Dim fruit(4) As String

(b) fruit(0) = "apple"

(c) Dim scores(19) As Integer

For index = 0 To scores.Length - 1

scores(index) = 10

Next

See VB program Ch 5 Exercise 1 array operations.txt

2. See VB program Ch 5 Exercise 2 student marks.txt

3. See VB program Ch 5 Exercise 3 2-D temperatures.txt

4. See VB program Ch 5 Exercise 4 top game score.txt

Chapter 6 – Validating user input

# In-text questions

**Q1:**

Dim prodCode = ""

While Len(prodCode) < 6 Or Len(prodCode) > 10

    Console.Write("Please enter 6 to 10 character product code: ")

    prodCode = Console.ReadLine()

    If Len(prodCode) < 6 Or Len(prodCode) > 10 Then

        Console.WriteLine("Invalid code")

    End If

End While

Console.ReadLine()

See VB program Ch 6 Question 1 length check.txt

# Exercises

1. See VB program Ch 6 Exercise 1 theatre tickets.txt

2. See VB program Ch 6 Exercise 2 validate car reg.txt

3. See VB program Ch 6 Exercise 3 verify email address .txt

4. See VB program Ch 6 Exercise 4 validate password.txt

5. See VB program Ch 6 Exercise 5 Caesar cipher.txt

Chapter 7 – Searching and sorting

# In-text questions

**Q1:** Console.WriteLine(studentMarks.Item("Robina"))

# Exercises

1. See VB program Ch 7 Exercise 1 anagrams.txt

2. See VB program Ch 7 Exercise 2 dictionary of telephone numbers.txt

3. See VB program Ch 7 Exercise 3 temperatures in array of records.txt

4. See VB program Ch 7 Exercise 4 processing array of records.txt

Chapter 8 – Procedures and functions

# In-text questions

**Q1:** Console.Write("Input your age: ")

     Dim age = Console.ReadLine()

**Q2:** Hello Jo *(or whatever name was entered by the user)*

Jo is Player 1

**Q3:** Sub Birthday(name, age)

    Console.WriteLine("Happy birthday, " + name + "! You're " + Str(age) + " today!")

End Sub

See VB program Ch 8 Question 3 Happy Birthday.txt

**Q4:** The output will be:

In main program, Name = Kumar

in procedure NameOne, Name = Kumar

in procedure NameOne, Name = Alice

In main program, Name = Alice

in procedure NameTwo, Name = Alice

in procedure NameTwo, Name = Bob

In main program, Name = Bob

# Exercises

1. See VB program Ch 8 Exercise 1 cube sub.txt

2. See VB program Ch 8 Exercise 2 encrypt a message.txt

3. See VB program Ch 8 Exercise 3 max temperatures.txt

4. See VB program Ch 8 Exercise 4 weekly pay.txt

Chapter 9 – Reading and writing files

# In-text questions

**Q1:** See VB program Ch 9 Question 1 read and print temperature file.txt

**Q2:** See VB program Ch 9 Question 2 integer temperatures.txt

**Q3:** Dim a, b, c, d As Integer

a = 3

b = 4

c = a + b

d = a \* b

Console.WriteLine("{0} + {1} = {2}", a, b, c)

Console.WriteLine("The product of {0} and {1} is {2}", a, b, d)

See VB program Ch 9 format strings.txt

# Exercises

1. See VB program Ch 9 Exercise 1 create or append to student file.txt

2. See VB program Ch 9 Exercise 2 girls in Yr 10.txt

3. See VB program Ch 9 Exercise 3 year group and gender.txt

Chapter 10 – Databases and SQL

# Exercises

1. CREATE TABLE tblScores

(

playerID TEXT,

firstname TEXT,

surname TEXT,

score1 INTEGER,

score2 INTEGER,

score3 INTEGER,

primary key (playerID)

)

(Lowercase *text*, *integer* is also acceptable)

2. INSERT INTO tblScores(playerID, firstname, surname, score1, score2, score3)

VALUES (“MF123”, “Maria”, “Ferdinand”,0, 0, 0)

3. UPDATE tblScores

SET score1 = 87, score2 = 79, score3 = 63

WHERE playerID = “MF123”

4. SELECT score1

FROM tblScores

where playerID = “MF123”

5. SELECT \*

FROM tblScores

where playerID = “MF123”

Chapter 11 – Using SQLite

# Exercises

1. See VB program Ch 11 Exercise 1.txt

2. See VB program Ch 11 Exercise 2.txt

3. See VB program Ch 11 Exercise 3.txt

Chapter 12 – Introduction to the graphical user interface

# Exercises

1. See VB program Ch 12 Exercise 1

2. (a) See VB program 12 Exercise 2a

(b) See VB program Ch 12 Exercise 2b

Chapter 13 – Developing a Windows application

# Exercises

1. See VB programs Ch 13 Exercise 1

2. See VB program Ch 13 Exercise 2

3. See VB program Ch 13 Exercise 3

4. See VB program Ch 13 Exercise 4

Chapter 14 – Program design

# Exercises

1. See VB program Ch 14 Exercise 1 calculate area.txt

2. See VB program Ch 14 Exercise 2

Chapter 15 – Testing and debugging

# In-text questions

**Q1:** the prompt for number of tickets needs to be repeated in the Catch section, instead of the Flag = False statement.

If Number >= 0 And Number < 120 Then

should be

If Number >= 0 And Number <= 120 Then

# Exercises

1. As it stands, the program adds 1 to the variable passwordChecks each time a valid lowercase or uppercase letter is detected. It also adds 1 to passwordChecks if the password length is within the acceptable range. However, it will accept any password with at least 3 valid upper- or lowercase letters.

There need to be separate flags for each condition, i.e. between 8 and 15 letters, an uppercase letter, a lowercase letter, and a number.

See VB program Ch 6 Exercise 4 validate password.txt

2. The program works correctly if the correct password is entered on the first attempt.

If the user enters an incorrect password, the statement

input("Password incorrect - re-enter: ")

is executed. However, even when the correct password is entered, it is not accepted.

The input should be assigned to the variable Password, i.e.

Password = Console.ReadLine()

Note that there is no limit to the number of tries the user can have in this version.

See VB program Ch 6 Exercise 5 Caesar cipher.txt

Every effort has been made to ensure that all answers are correct. Any errors should be reported directly to support@pgonline.co.uk and changes will be made in any subsequent editions of the material.

Artwork



Fosse No. 1 © 2015 Barbara Burns

Oil on linen, 30x30cm

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