Python Workshop Exercises

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Feb 15, 2014

Exercises

Exercise 1

Write a Python program to print "Hello, World!" and save this in a file named *helloworld.py*. Make this program executable and run it like: *./helloworld.py*

Exercise 2

Write a Python program (*ex2.py*) to swap values of two variables.

Exercise 3

Write a program that asks for two numbers. If the sum of the numbers is greater than 100, print "That is a big number."

Exercise 4

Write a program that asks the user their name, if they enter your name say "That is a nice name", if they enter "John Cleese" or "Michael Palin", tell them how you feel about them ;), otherwise tell them "You have a nice name."

Exercise 5

Rewrite the below program (*ex5.py*) to have a separate function for the area of a square, the area of a rectangle, and the area of a circle (3.14 * radius ** 2). This program should include a menu interface.

```
# By Amos Satterlee
print
def hello():
    print 'Hello!'

def area(width, height):
    return width * height

def print_welcome(name):
    print 'Welcome,', name

name = raw_input('Your Name: ')
```

```
hello(),
print_welcome(name)
print
print 'To find the area of a rectangle,'
print 'enter the width and height below.'
print
w = input('Width: ')
while w <= 0:
    print 'Must be a positive number'
    w = input('Width: ')

h = input('Height: ')
while h <= 0:
    print 'Must be a positive number'
    h = input('Height: ')

print 'Width =', w, 'Height =', h, 'so Area =', area(w, h)
```

Exercise 6

Expand the *ex6.py* program given below so it has a menu giving the option of taking the test, viewing the list of questions and answers, and an option to quit. Also, add a new question to ask, "What noise does a truly advanced machine make?" with the answer of "ping".

```
## This program runs a test of knowledge

# First get the test questions
# Later this will be modified to use file io.
def get_questions():
    # notice how the data is stored as a list of lists
    return [["What color is the daytime sky on a clear day? ", "blue"],
            ["What is the answer to life, the universe and everything? ", "42"],
            ["What is a three letter word for mouse trap? ", "cat"]]

# This will test a single question
# it takes a single question in
# it returns True if the user typed the correct answer, otherwise False

def check_question(question_and_answer):
    # extract the question and the answer from the list
    question = question_and_answer[0]
    answer = question_and_answer[1]
    # give the question to the user
    given_answer = raw_input(question)
    # compare the user's answer to the testers answer
    if answer == given_answer:
        print "Correct"
        return True
    else:
        print "Incorrect, correct was:", answer
        return False

# This will run through all the questions
def run_test(questions):
    if len(questions) == 0:
        print "No questions were given."
        # the return exits the function
        return
```

```
    index = 0
    right = 0
    while index < len(questions):
        # Check the question
        if check_question(questions[index]):
            right = right + 1
            index = index + 1
        # go to the next question
        else:
            index = index + 1
    # notice the order of the computation, first multiply, then divide
    print "You got", right * 100 / len(questions),\
           "% right out of", len(questions)

# now let's run the questions

run_test(get_questions())
```

Exercise 7

Rewrite the below program (*ex7.py*) to use a random integer between 0 and 99 instead of the hard-coded 78. Use the Python documentation to find an appropriate module and function to do this.

```
# Plays the guessing game higher or lower

number = 78
guess = 0

while guess != number:
    guess = input("Guess a number: ")
    if guess > number:
        print "Too high"
    elif guess < number:
        print "Too low"

print "Just right"
```

Answers

Answer 1

1. Content of *helloworld.py*:

```
#!/usr/bin/env python

print "Hello, World!"
```

2. Change mode from shell:

```
$ chmod +x helloworld.py
```

3. Run program and verify output like this:

```
$ ./helloworld.py
Hello, World!
```

Answer 2

1. Content of the file *ex2.py*:

```
x, y = 2, 3
x, y = y, x
print x, y
```

2. Run program and verify output like this:

```
$ python ex2.py
3 2
```

Answer 3

1. Content of the file *ex3.py*:

```
number1 = input('1st number: ')
number2 = input('2nd number: ')
if number1 + number2 > 100:
    print 'That is a big number.'
```

2. Run program and verify output like this:

```
$ python ex3.py
1st number: 56
2nd number: 78
That is a big number.
```

Answer 4

1. Content of the file *ex4.py*:

```
name = raw_input('Your name: ')
if name == 'Ada':
    print 'That is a nice name.'
elif name == 'John Cleese' or name == 'Michael Palin':
    print 'Wow. that\'s a great name!'
else:
    print 'You have a nice name.'
```

2. Run program and verify output like this:

```
$ python ex4.py
Your name: Ada
That is a nice name.
$ python ex4.py
Your name: John Cleese
Wow. that's a great name!
$ python ex4.py
Your name: Jack
You have a nice name.
```

Answer 5

1. Content of the file *ex5.py*:

```
def square(length):
    return length * length

def rectangle(width , height):
    return width * height

def circle(radius):
    return 3.14 * radius ** 2

def options():
    print
    print "Options:"
    print "s = calculate the area of a square."
    print "c = calculate the area of a circle."
    print "r = calculate the area of a rectangle."
    print "q = quit"
    print

print "This program will calculate the area of a square, circle or rectangle."
choice = "x"
options()
while choice != "q":
    choice = raw_input("Please enter your choice: ")
    if choice == "s":
        length = input("Length of square: ")
        print "The area of this square is", square(length)
        options()
    elif choice == "c":
        radius = input("Radius of the circle: ")
        print "The area of the circle is", circle(radius)
        options()
    elif choice == "r":
        width = input("Width of the rectangle: ")
        height = input("Height of the rectangle: ")
        print "The area of the rectangle is", rectangle(width, height)
        options()
    elif choice == "q":
        print "",
    else:
        print "Unrecognized option."
        options()
```

Answer 6

1. Content of the file *ex6.py*:

```
## This program runs a test of knowledge

questions = [["What color is the daytime sky on a clear day? ", "blue"],
             ["What is the answer to life, the universe and everything? ", "42"],
              ["What is a three letter word for mouse trap? ", "cat"],
              ["What noise does a truly advanced machine make?", "ping"]]

# This will test a single question
# it takes a single question in
# it returns True if the user typed the correct answer, otherwise False

def check_question(question_and_answer):
    # extract the question and the answer from the list
    question = question_and_answer[0]
    answer = question_and_answer[1]
    # give the question to the user
    given_answer = raw_input(question)
    # compare the user's answer to the testers answer
    if answer == given_answer:
        print "Correct"
        return True
    else:
        print "Incorrect, correct was:", answer
        return False

# This will run through all the questions

def run_test(questions):

    if len(questions) == 0:
        print "No questions were given."
        # the return exits the function
        return
    index = 0
    right = 0
    while index < len(questions):
        # Check the question
        if check_question(questions[index]):
            right = right + 1
        # go to the next question
        index = index + 1
    # notice the order of the computation, first multiply, then divide
    print ("You got", right * 100 / len(questions),
           "% right out of", len(questions))

#showing a list of questions and answers
def showquestions(questions):
    q = 0
    while q < len(questions):
        a = 0
        print "Q:" , questions[q][a]
        a = 1
        print "A:" , questions[q][a]
        q = q + 1
```

```
# now let's define the menu function
def menu():
    print "-----------------"
    print "Menu:"
    print "1 - Take the test"
    print "2 - View a list of questions and answers"
    print "3 - View the menu"
    print "5 - Quit"
    print "-----------------"

choice = "3"
while choice != "5":
    if choice == "1":
        run_test(questions)
    elif choice == "2":
        showquestions(questions)
    elif choice == "3":
        menu()
    print
    choice = raw_input("Choose your option from the menu above: ")
```

Answer 7

1. Content of the file *ex7.py*:

```
from random import randint
number = randint(0, 99)
guess = -1
while guess != number:
    guess = input ("Guess a number: ")
    if guess > number:
        print "Too high"
    elif guess < number:
            print "Too low"
print "Just right"
```

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