University of Cape Town ~~ Department of Computer Science

Computer Science 1015F ~~ 2014

Class Test 1

** *Solutions* **

Enter the following details AND shade in the corresponding blocks to the right with your Student Number.

Faculty (please tick one):

Science	Engineering	Commerce	Humanities	Other:

Student Number :

_____

Name (optional) :

_____

Marks : 35

Time : 45 minutes

Instructions:

a) Answer all questions.

b) Write your answers in PEN in the spaces provided.

c) Show all calculations where applicable.

A ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 0
B ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 1
C ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 2
D ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 3
E ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 4
F ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 5
G ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 6
H ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 7
I ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 8
J ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ 9
K ▯ ▯ ▯ ▯ ▯ ▯
L ▯ ▯ ▯ ▯ ▯ ▯
M ▯ ▯ ▯ ▯ ▯ ▯
N ▯ ▯ ▯ ▯ ▯ ▯
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Q ▯ ▯ ▯ ▯ ▯ ▯
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W ▯ ▯ ▯ ▯ ▯ ▯
X ▯ ▯ ▯ ▯ ▯ ▯
Y ▯ ▯ ▯ ▯ ▯ ▯
Z ▯ ▯ ▯ ▯ ▯ ▯

FOR OFFICIAL USE ONLY:

Question	1	2	3	4	5	6	7	8
Max	10	8	17					
Marks								
Marker								

Marks

0 ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
1 ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
2 ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
3 ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
4 ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯ ▯
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Question 1 – Multiple choice [10]

Examine the Q1a.py and Q1b.py modules listed on the last sheet of the test. For each of the multiple choice questions, **write down ONE letter** corresponding to the correct answer.

(i) In the **Q1a.py** module, `a` is an example of:

A. a reserved word
B. a variable
C. a parameter
D. a function
E. C and D

_____

B

(ii) An example of a **reserved word** from **Q1a.py** is:

A. `print`
B. `a`
C. `def`
D. `10`
E. `int`

_____

C

(iii) The exact output of the **Q1a.py** module when it is run in the Python interpreter is:

A. `5and5and5=555 hahaha`
B. `5 and 5 and 5=15 ha-ha-ha`
C. `5and5and5=15 hahaha`
D. `15 ha-ha-ha 5and5and5=`
E. `builtins.TypeError`

_____

C

(iv) An example of a **literal** from **Q1b.py** is:

A. `print`
B. `a`
C. `def`
D. `10`
E. `int`

_____

D

(v) An example of a **boolean expression** from **Q1b.py** is:

A. `while`
B. `a,p=a//10,a%10`
C. `type(a)==str`
D. `print(a[::-1])`
E. `def Strange(a)`

_____

C

(vi) The output of this Python3 code

```
import Q1b
Q1b.Strange("tetchy")
```

is:

A. a logic error
B. nothing
C. `yhctet`
D. `p`
E. `tetch`

_____

C

(vii) The output of this Python3 code

```
import Q1b
Q1b.Strange(1234)
```

is:

A. `builtins.TypeError`

B. nothing

C. 1234

D. 4321

E. tetch

_____

D

(viii)The output of this Python3 code

```
import Q1b
Q1b.Strange(12.0)
```

is:

A. builtins.TypeError

B. nothing

C. 021

D. 120

E. 0.21

_____

B

(ix) The Python expression

```
eval("10/2") + 2
```

will evaluate as:

A. 7

B. "10/22"

C. "10/2 2"

D. 7.0

E. "10/2+2"

_____

D

(x) The Python expression

```
"butterfly"[1:6:2]
```

will evaluate as:

A. 'utr'

B. 'bte'

C. 'btef'

D. 'fly'

E. 'butter'

_____

A

Question 2 [8]

Chicken eggs weigh between 33 and 75 grams when laid. Write a function called `gradeEgg` which prints the grade of an egg given its weight in grams, as follows:

Grade	**Egg weight**
Jumbo egg	Weight more than 66 grams
X-large egg	Weight more than 59 grams
Large egg	Weight more than 51 grams
Medium egg	Weight more than 43 grams
Small egg	Weight more than 33 grams

The gradeEgg function should print the grade of the egg. Incorrect input, such as strings or weights outside the correct range must be dealt with appropriately. For example:

```
>>>gradeEgg(45)
Medium
>>>gradeEgg("hello")
Input to gradeEgg must be a number!
>>>gradeEgg(90)
Invalid weight supplied
>>>gradeEgg(32)
Invalid weight supplied
>>>gradeEgg(67)
Jumbo
```

```
#Q2ANS.py
def gradeEgg(w):  #[1] for def gradeEgg,  [1]for parameter
    if type(w)!=int and type(w)!=float: #[1] for ensuring no strings.  Differetn solutions
possible
        print("Input to gradeEgg must be a number!")
    elif w >75 or w<33:  #[1] for numbers outside of range
        print("Invalid weight supplied")
    elif w>66:
        print("Jumbo")
    elif w>59:
        print("X-large")
    elif w>51:
        print("Large")
    elif w>43:
        print("Medium")
    else: print("Small")  #[2] for correct use of if/elif ladder
    #[2] for correct categorization and output
```

Question 3 [17]

Examine the Q3a.py module listed at the end of this test and answer the following questions.

(i) Write down the **exact output** of this module

```
import Q3a
Q3a.slide("apple")
```

when it is run in the Python interpreter (i.e. when you press "Run" in the Wing IDE). [3]

a

pp

ppp

llll

eeeee

!!!!!!

(ii) Rewrite the `slide` function in module Q3a.py so that it works exactly the same as before, but uses an indefinite loop. [6]

```
#Module Q3a.py
def slide(s):
    t=1
    i=0 #[1]
    while s:  #[2]
```

```
        print(s[0]*t) #[1]
        t+=1
        i+=1 #[1]
        s=s[1:]  #[1]
    print("!"*(len(s)+1)
```

(iii) Show, using **an example**, how the output of the function bar (in module Q3a.py) will change if the word **break** is changed to the word **continue**. [3]

```
#
The function bar(x,y,c) outputs x lines of y characters, where the odd numbered lines of
length y and the even numbered characters of length c.
If  break is changed to continue, all the lines will be the same length  # [1]

Example bar(4,6,'a')
output with break: [1]

aaaaaa
aaa
aaaaaa
aaa

output with continue: [1]

aaaaaa
aaaaaa
aaaaaa
aaaaaa
```

(iv) Using the **functions in module Q3a.py**, how can we print this pattern?

```
444
4
333
3
333
444444
444
333333
333
333333
444444444
4444
333333333
3333
333333333
444444444444
444444
333333333333
333333
333333333333
```

Write down the code for the complete module to print the pattern. [5]

```
#Module Q3aANS2.py
import Q3a  #[1] for import
for i in range(3,13,3):  #[1] loop, [1] for correct range
    #other loops can work too, of course
    Q3a.bar(2,i,4)   #[1] correct function call
    Q3a.bar(3,i,3)      #[1] correct function call

#can also get full marks for doing it without a loop.
```

Code examples for the test – you may detach this sheet.

Question 1

```
#Module Q1a.py
def Peculiar():
    a=5
    print(a*3,sep='-',end=" ")
    a='ha'
    print(a*3,sep='-',end=" ")

def Ln():
    print(5,5,5,sep='and',end='=')

Ln()
Peculiar()
```

```
#Module Q1b.py
def Strange(a):
    if type(a)==str:
        print(a[::-1])
    elif type(a)==int:
        while a:
            a,p=a//10,a%10
            print(p,end="")
```

Question 3

```
#Module Q3a.py
def slide(s):
    t=1
    for i in s:
        print(i*t)
        t+=1
    print("!"*(len(s)+1))

def bar(x,y,c):
    i=0
    while i<x:
        j=0
        while j<y:
            j+=1
            print(c,end='') #'' is the empty string
            if i%2==1 and j==y//2: break
        i+=1
        print()
```