Name:

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Student Number:

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Please fill in your Student Number and Name.

Student Number : _____

Science Faculty Student? (please circle):

Y	N

University of Cape Town ~ Department of Computer Science

Computer Science 1015F ~ 2013

Class Test 1

Question	Max	Internal	External
1	22		
2	8		
3	20		
TOTAL	**50**		

Marks : 50

Time : 60 minutes

Instructions:

a) Answer all questions.

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

c) Show all calculations where applicable.

Question 1 [22]

Examine the Q1a.py module listed on the last sheet of the test and answer the following questions.

(a) From the Q1a.py module**, give an example of:**

i. a variable [1]

ii. a numerical operator [1]

iii. a string function [1]

(b) Python is a dynamically typed language. Explain what this means, **using an example** from the code listed in module Q1a.py. [3]

(c) Explain as simply as possible, why it is necessary to use the `eval()` function in the `Q1a.py` module. [3]

(d) Write down the exact output of the `Q1a.py` module if the user runs the module in Python and types in the value '5' . [4]

(e) Write down the exact output of the `Q1a.py` module if the user runs the module in Python and types in the value 'hello' . [4]

(f) Write a function called `chomp` that takes a string as a parameter and prints out only the first and last letters in the string, with a '+' charater between them (and **no spaces**). For example,

```
chomp("bug")
```

will print

```
b+g
```

and

```
chomp("awesome")
```

will print

```
a+e
```

etc.

[5]

Question 2 [8]

Assume that the South African Revenue Service (SARS) has released new income tax categories, as follows:

Total taxable income for the year :	Tax Bracket
0 up to (not including) R200 000	A
R200 000 up to (not including) R400 000	B
R400 000 up to (not including) R600 000	C
R600 000 and above	D

Write a simple Python program to classify an income into a tax bracket. Your program should ask the user to type in the income and print out the correct tax bracket. You can assume that the user will always input digits only, but numbers outside the correct range must be dealt with appropriately. [8]

Question 3 [20]

Examine the Q3a.py module listed on the last sheet of the test and answer the following questions.

(a) From the Q3a.py module**, give an example of:**

i. a relational operator [1]

ii. a parameter [1]

iii. a boolean expression [1]

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

```
import Q3a
Q3a.puzz('a',2)
Q3a.zupp('b',3)
```

when it is run in the Python interpreter (i.e. when you press "Run" in the Wing IDE). [2]

(c) Write down the **exact output** of this code

```
import Q3a
Q3a.puzz(4,'a')
```

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

(d) Using **the functions in module** Q3a.py, how can we make this pattern? [7]

a
aa
aaa
aaaa
bbbb
bbb
bb
b
b
bb
bbb
bbbb
aaaa
aaa
aa
a

Write down the code for the complete module to print the pattern below.

(e) The function `puzz` uses a `for` (definite) loop. Rewrite the function in the space below so that it **works exactly the same as before,** but now uses a `while` (indefinite) loop. [5]

```
def puzz(h,c1):
```

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

Question 1

```
#Q1a.py
x=input("Type in a number:")
mult1=x*3
print("Str mult:",mult1)
if x.isdigit():
     x=eval(x)
     mult2=x//2
     print("Num. div:",mult2)
else: print("Invalid number")
```

Question 3

```
#Q3a.py
def puzz(h,c1):
     if type(h)==int:
          for i in range(h,0,-1):
               print(i*c1)
     else: print('***')

def zupp(h,c2):
     if type(h)==int:
          for i in range(1,h):
               print(i*c2)
     else: print('!!!')
```