University of Cape Town Department of Computer Science

Computer Science CSC1010H

Class Test 2

Wednesday, 20 August 2014

Marks: 35 Time: 40 minutes				 Approximate marks per question are shown in brackets The use of calculators is permitted 			
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STUDEN	T NO:	MTS	SEDUba	COURSE CODE: CSC 1 010 H			
This paper	consists			·	ing this cove	er page).	
			Mark	Allocation			
Question	Marks	Internal	External	Question	Marks	Internal	External
1	5			5	4		
2	7			6	6		
3	6						
4	7						
Total			Total				
			•	Gı	rand Total		
				F	inal Mark		1
Internal Examiner:				External Examiner:			

Question 1. [5 marks]

Consider the following problem. Answer it appropriately.

The Petersens have recently moved to a new town and are arranging a surprise birthday party for their son Andre, and have invited three families from the neighbourhood, the Smiths, the Januarys and the Hectors. They plan to make up party packets for the kids to take home after the party, blue for boys and pink for girls.

Being super organised, Mrs Petersen with the help of Mr Petersen wants to determine how many of each colour party packet she needs to buy, and also how many of each colour she needs to put aside for each family.

1

They sit down and come up with the following information. Mrs Petersen remembers that the Hectors have a "pigeon pair", i.e. a boy and a girl. Mr Petersen recalls that the Januarys only have a set of identical twin boys. Mrs Petersen notes that she's only ever noticed two girls from these local families to come over to play. Mr Petersen notes that the Smiths have three children, since the family fits nicely into their family sedan when they go out.

You happen to be visiting the Petersens at this point, and want to impress them with the problem solving skills you've learnt at university. Using the information they've provided, determine how many of each colour party packet they need to buy and how many of each colour they need to allocate to each family and what the total number of party packets are.

Use a diagram to show how you solve the problem.

	Boys	Gills
	Blue	Pink
Smiths	2	1
Januarys	2	O
Januarys Hectors		1

The Hectors have a boy and a girl, meaning
I blue & I pink party packets. The Januarys have
z twin boys, meaning z blue packets. Since there
are z girls from these families, this means that the
Smiths have a daugher & z boys. 5 blue and z
pink packets must be bought, with z blue & [5]
I pink going to the Smiths, 2 blue going to
the Januarys & Ibbue 2 and I pink going to the
Hectors

Question 2. [7 marks]

Answer the following questions:

a) When using debugging features in an IDE, what should the user typically do one execution has reached the breakpoint?	e
The user should step over the code, do use	_
input output and watch how variables cha	nge
in the stack window	[2]
b) When a new module has been defined, how do you ensure that it is accessible and imported into a program with no problems, i.e. "import newmodule" works?	l can be
By saving It in the Python/Lib Directory	[1]
c) Explain what happens in memory when Python makes successive recursive functi	on calls.
runitime stack overflow occurs, meaning	
insufficient memory	[1]
Indicate whether the following statements are True or False.	
d) The accepted Python coding convention for module names is long descriptive nar uppercase.	nes in
False	[1]
e) Curly brackets {} are used to enclose parameters to a function.	
false	[1]
f) The print() function can be used to write to a file.	
True	[1]

Question 3. [6 marks]

Write a Python function called draw_line() which draws a horizontal line of characters. The draw_line() function should take two parameters, with the first being the size of the line (i.e. the number of characters) and the second parameter being the character with which to draw the line. This character parameter should have a default value of an asterisk ('*').

Calling the draw_line() function with the following parameters should produce the corresponding output:

```
draw_line(5)
draw_line(6,'$')

def draw_line (size, character):

inty_size=int(size)

f character == "":

print ("{}", format ("*"*size)

print ("{}", format (character *size)

draw_line (4, "#")

draw_line (4, "#")

[6]
```

Question 4. [7 marks]

Consider the following recursive function definition:

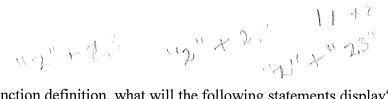
```
def do_this(stuff):
    if len(stuff) == 0:
        return ""
    else:
        return str(stuff[0] * 2) + do_this(stuff[1:])
```

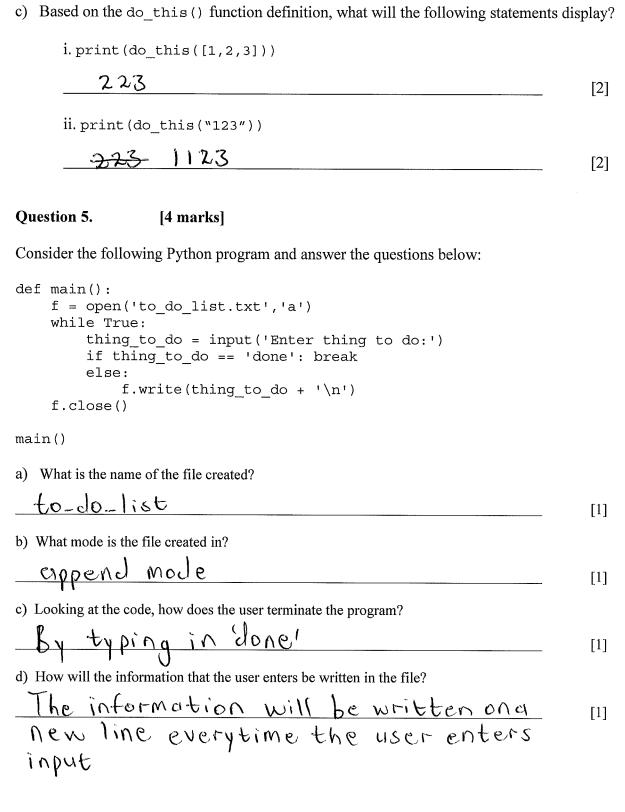
a) What datatype can the parameter to this function be?

b) What is the base case for this function?

If the length of the string is zero, it'll return [1]

an empty space, which is the base case





Question 6. [6 marks]

Consider the following definition of the classify weight() function. Specify test cases which thoroughly test the function, using equivalence classes and boundary value. For each test case specify whether it is an equivalence class value or a boundary value.

```
# classifies weight in kgs
      def classify weight (w):
         if 0 < w <= 60:
            return "light"
         elif 60 < w <= 120:
            return "heavy"
         else:
            return "error"
- Equivalence classes
            category values: 20,109
            erroneous values: -1,0
- Boundary values
        * on boundary: 60,120
        * below boundary: -1, -7
*above boundary: 122,170
```

[6]