

CSC104 The How and Why of Computing  
Winter 2008  
Term Test 2  
Friday, March 28, 2008  
9:10 a.m. (50 minutes)

Solutions

Remember to put your student number on the bottom of each following page – in case your pages get separated.

**HINT:** Don't get bogged down on questions that reward you with few marks – answer the questions that you can do easily for the most marks first. Then come back to questions that will take you more time.

**Question 1 [5 marks] Communications and the Web - Short answer:**

*Complete the following:*

**Communications**

a. What do the following acronyms stand for, and what do they mean:

LAN:

local area networks - (a local computer network for communication between computers;

WAN:

Wide area networks - A network connecting computers within very large areas, such as states, countries, and the world.

b. Name and describe three network topology configurations? (Draw a small diagram if it helps.)

1: ring - connected in a circle

2: bus - connected by same communication line

3: star - connected through machine in the centre

In the context of **communications**, what is a Bridge and what is a Router. What differentiates them?:

A Bridge is::	joins two equivalent networks
A Router is:	connect networks - not necessarily equivalent - to create an internet

## The Internet

### c. Domains.

What is a domain?

a network or relatively small internet - operated by a single organization - e.g., a company or a university,

Describe two means of identifying a domain:

ip address: the 32 bit address consists of 4 bytes separated by a dot.

There are 4 bytes - each byte represents a number in the address.

The domain name that is registered with the name server

### d. Given the following URL:

`http://www.cs.toronto.edu/~faye/104/tutorials.html`

Describe what each part of this URL is:

`cs` = subdomain

---

`toronto.edu` = domain

---

`~faye/104/` = path to file

---

`tutorials.html` = file to be served

---

`http://` = hypertext transfer protocol

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### e. Give two examples of client-server software. Describe what each does .

`print server` – prints documents on request for a client

---

`name server` – on the web – maps the domain name to the ip address to direct requests to the correct domain location.

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**Question 2 [5 marks] Describe the output:**

Given the following code:

```
def printSomething(x,y,z):
    a = range(x,y,z)
    for x in a:
        if x%5 == 0:
            print "Ant"
        elif (x + 2)%2 == 0:
            print "Dog"
        elif x%4 == 0:
            print "Cat"
        elif x%3 == 0:
            print "Bird"
        elif x == 1:
            print "Monkey"
        else:
            print "Camel"
printSomething(10,1,-1)
printSomething(1,10,2)
```

In the space below, show exactly what will be displayed (printed) when the above code is executed:

If they get everything except the even numbers – give 2.5

if correct give 5

if partly correct but mostly wrong – give 1

Ant  
Bird  
Dog  
Camel  
Dog  
Ant  
Dog  
Bird  
Dog  
Monkey  
Bird  
Ant  
Camel  
Bird

**Question 3 [5 marks] Correct the code:**

Given the following code (note that line numbers are displayed for reference purposes only and should not be considered part of the code):

```
01 # this function looks at all the words in a word list
02 # and returns the longest word.
03 def longestWord(wordList):
04     longestWord = 0 (1) initialize longestWord to the first word
05     for i in range(1, len(wordList)):
06         if len(wordList[i]) > longestWord: (2)
07             longestWord = wordList[i]
08     return longestWord
09
10 # here we call the function using a list that we create
11 myList = {"(3)me", "day", "you", "will", "graduate", "and", "leave"} (4)
12 print longestWord(myList) (5)
```

There are at least five mistakes in the above code. First, You must identify five errors. In the above code, you must first tag the each code error with a circled error number. e.g. (1) Then in the space below, describe each error you have tagged, and the correct code.

(1) Why it is wrong: \_\_\_\_\_  
longestWord = wordList[0]  
Correct code is: \_\_\_\_\_

(2) Why it is wrong: \_\_\_\_\_  
if len(wordList[i]) > len(longestWord):  
Correct code is: \_\_\_\_\_

(3) Why it is wrong: \_\_\_\_\_  
myList = ["some", "day", "you", "will",  
"graduate", "and", "leave"]  
Correct code is: \_\_\_\_\_

(4) Why it is wrong: \_\_\_\_\_  
myList = ["some", "day", "you", "will",  
"graduate", "and", "leave"]  
Correct code is: \_\_\_\_\_

(5) Why it is wrong: \_\_\_\_\_  
print longestWord(myList)  
Correct code is: \_\_\_\_\_

#### Question 4 [6 marks] HTML

You want to make the following web page

*Surfing* The *World-Wide Web*

*W*hen you surf the web, you hope to catch that perfect wave! It might just look like this:



If you fall off your board, you may have to [run a new web browser](#) and start surfing all over again.

Given the following text (with image tags already provided), add the necessary html tags to create the above page and fill in the remaining missing text.

Also, add a tag that will cause the user to navigate to <http://www.cs.toronto.edu/~faye/browser.html> when they click on the text “[run a new web browser](#)” (which is highlighted above).

The title of our page is “Surfing the Web”

```
<html><head><title>Surfing the Web</title></head>
```

```
<body>
```

```
<h1>
```

```
 The orld-ide eb </h1>
```

```
hen  
you surf the web, you hope to catch that perfect wave!  
It might just look like this:
```

```

```

```
If you fall off your board, you may have to
```

```
<a href="http://www.dgp.toronto.edu/~faye/browser.html">run a new web browser</a> and  
start surfing all over again. </p></body></html>
```

**Question 5 [9 marks] Write 3 functions in Python [3 marks]**

In the space below, write a Python function `printTriangle(n)` that accepts a number `n`, and prints a triangle as shown in the following table:

In other words, starting with one star, and printing a space after each star, print the rows as necessary to create the triangle. Print up to a maximum of `n` stars in the longest row of the triangle.

3 marks

if nested loop – and is close, give full marks

if partly right, give half marks

else – if they have no clue – give zero

```
def printStars(n):
    for i in range(n):
        for j in range(i + 1):
            print '*',
        print
    for i in range(n-1,0,-1):
        for j in range(i):
            print '*',
        print
```

or using while

```
def printStars(n):
    i = 0
```

```
while i < n:
    j = 0
    while j <= i:
        print '*',
        j = j + 1
    print
    i = i + 1
i = i - 1
while i >= 0:
    j = 0
    while j < i:
        print '*',
        j = j + 1
    print
    i = i - 1
```

**[3 marks]**

In the space below, write the python function `myPower(a, i)` that calculates `a` raised to the power of `i` and returns the result.

**hint:** to raise a number `x` to the power of another number `y` you must multiply `x` by itself `y` times.

e.g.,  $a^2$  (a to the power of 2) =  $a \times a$   
 $a^3$  (a to the power of 3) =  $a \times a \times a$   
 $a^4$  (a to the power of 4) =  $a \times a \times a \times a$

Also, `a` to the power of 0 is 1. Assume that `i` is greater or equal to zero.

**Bonus mark:** 1 bonus mark if you use recursion correctly (though recursion is not required)

full marks plus bonus if correct recursion

recursion:

```
def myPower(a,i):
    if i == 1:
        return a
```

```
return a * myPower(a, i-1)
```

full marks if correct – minus ½ each error, zero if no idea what to do.

```
def myPower(a,i):  
    x = 0  
    result = 1  
    while x < i:  
        result = result * a  
        x = x + 1  
    return result
```

**[3 marks]**

In the space below, write the python function `smallestWord(word1, word2, word3)` that accepts three words, and returns the shortest word of the three.

can use elif for this one as well. -1 for each logic error.

Full marks if correct

```
def smallestWord(word1, word2, word3):  
    if len(word1) < len(word2) and len(word1) < len(word3):  
        return word1  
    if len(word2) < len(word3):  
        return word2  
    return word3
```