THE UNIVERSITY OF AUCKLAND

SUMMER SEMESTER, 2013
Campus: City

COMPUTER SCIENCE

Mastering Cyberspace: An Introduction to Practical Computing

(Time Allowed: TWO hours)

NOTE:
You must answer **all** questions in this exam.
No calculators are permitted
Write your answers in the space provided in this booklet.
There is space at the back for answers that overflow the allotted space.

Surname	
Forenames	
Student ID	
Login (UPI)	

	Question	Mark	Out Of
1	Hardware and Software		15
2	Internet		15
3	Programming using Python		12
4	Spreadsheets		14
5	XHTML and CSS		12
6	AI and Social Issues		8
7	Databases		12
8	LaTeX		12
	TOTAL		100

1. Hardware and Software (15 marks)

(a) What does each of the following acronyms stand for?

(i) RAID:

(ii) USB:

(iii) ROM:

(3 marks)

(b) Name **four** components which can be found inside a computer's system unit.

(i)

(ii)

(iii)

(iv)

(4 marks)

(c) Name **two** types of printers.

(i)

(ii)

(2 marks)

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(d) Give **two** examples of system software.

(i)

(ii)

(2 marks)

(e) Who was the founder of the Free Software Foundation (FSF)?

(2 marks)

(f) What binary number is equivalent to the decimal number 22?

(2 marks)

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2. Internet (15 marks)

(a) What do LAN and WAN stand for and what is the main difference between them?

LAN:

WAN:

Main Difference:

(3 marks)

(b) What are POP3 and IMAP used for and what is the difference (if any) between them?

(3 marks)

(c) Is it possible to view the history of wiki pages? Please explain your answer briefly.

(3 marks)

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(d) What does HTTP stand for and what is it used for?

(3 marks)

(e) What does WWW stand for and what is it?

(3 marks)

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3. Programming using Python (12 marks)

(a) Write a program that calculates and displays the area of a triangle. The prompts and output must be formatted as per the two examples below.

At the beginning, the user is asked to enter the base and height of the triangle **in metres**. The user may enter these two values with a decimal point.

The area of a triangle is half of the base multiplied by the height.

If the area is over 1 square kilometre (1,000,000 square metres) then it is displayed in square kilometres, otherwise it is displayed in square metres.

Example 1: If the user entered **4000** for the base and **3000** for the height, the output that is expected from your program is shown below:

```
Enter base (metres): 4000
Enter height (metres): 3000
Triangle area is 6.0 square kilometres
```

Example 2: If the user entered **10** for the base and **2.5** for the height, the output that is expected from your program is shown below:

```
Enter base (metres): 10
Enter height (metres): 2.5
Triangle area is 12.5 square metres
```

CONTINUED

```
Please enter a number: 12
 % 1
 % 2
 % 3
 % 4
!% 5
 % 6
Double!
counter: 13
```

4. Spreadsheets (14 marks)

All parts of this question refer to the spreadsheet shown below. The left side of the spreadsheet shows a table of prices per kilogram for different fruit and vegetables. The right side of the spreadsheet shows a list of sales of particular food items.

	A	B	C	D	E	F	G	H	I	J	K
1											
2		**Food Price Per Kg**						**Food Sales**			
3		Apple	$0.50			Sale	Type	Price per Kg	Weight (Kg)	Wheelbarrow	Price	Running Total
4		Banana	$0.80			1	Apple	$0.50	8.0	N	$4.00	$4.00
5		Carrot	$0.75			2	Banana	$0.80	10.0	N	$8.00	$12.00
6		Eggplant	$3.14			3	Apple	$0.50	4.0	N	$2.00	$14.00
7		Garlic	$1.62			4	Carrot	$0.75	16.0	Y	$12.00	$26.00
8		Lettuce	$1.00			5	Lettuce	$1.00	6.0	N	$6.00	$32.00
9		Onion	$0.20			6	Onion	$0.20	10.0	N	$2.00	$34.00
10		Orange	$0.42			7	Pear	$0.60	5.0	N	$3.00	$37.00
11		Pear	$0.60			8	Lettuce	$1.00	12.0	Y	$12.00	$49.00
12						9	Apple	$0.50	14.0	Y	$7.00	$56.00
13						10	Onion	$0.20	20.0	Y	$4.00	$60.00
14											
15									**Average Price per Sale:**	$6.00	

(a) In cell J15 the average price of the sales from the list directly above is shown. What is the **best** formula to use in cell J15?

(2 marks)

(b) Cell I4 records whether a wheelbarrow is needed ("Y") or not ("N") for the sale. A wheelbarrow is needed if the weight (H4) is **over** 10 Kg. What is the **best** formula to use in cell I4?   **Note:** The formula must be able to be filled down.

(2 marks)

(c) Cell J4 records the total price of the sale item (Price per Kg multiplied by Weight). What is the **best** formula to use in cell J4?   **Note:** The formula must be able to be filled down.

(2 marks)

CONTINUED

(d) Cell G4 uses a VLOOKUP formula to look up the **Price per Kg** of the food item in cell F4.

The syntax of the **vlookup** function is given below:

```
vlookup(lookup_value, table_array, col_index_num,[range_lookup])
```

What is the **best** formula to use in cell G4?
Note: The formula **must** use the VLOOKUP function to get the appropriate unit from the table in cells B3:C11 and **must** be able to be filled down.

(4 marks)

(e) In **one** sentence, explain why you chose the value you used for **range_lookup** above.

(1 mark)

(f) Cell K4 displays the total price of all sales up to that point. What is the **best** formula to use in cell K4? **Note:** The formula must be able to be filled down.

(3 marks)

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5. XHTML and CSS (12 marks)

(a) The following web page has been successfully validated as XHTML 1.0 Strict. On the following page, draw what the page will look like when it is displayed by a web browser.   Indicate bold text by drawing it much **darker** than the rest of the text.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
 <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en"
lang="en">

<head>
   <title>Exam</title>
   <style type="text/css">
     #text {text-align:center;}
     #italic {font-style:italic;}
     #right{text-align:right;font-variant:small-caps;}
     .term{text-transform:uppercase;}
     .strong{font-weight:bold;}
     #group{border-style:solid;border-width:medium;}
   </style>
</head>

<body>
      <h1 id="text">Grand Canyon</h1>
      <h2 id="right">Arizona</h2>
      <div id="group">
      <p><span id="italic">The Grand Canyon</span> is a:
         steep-sided canyon
         carved by the Colorado River
         in the United States.



         Its <span class="strong">most popular </span>
         tourist activities are:
      </p>
      <dl>
        <dt class="term">On Land:</dt>
        <dd>Hiking, bus tours</dd>
        <dt class="term">On Water: </dt>
        <dd>Rafting, canoeing</dd>
      </dl>
      </div>
</body>
</html>
```
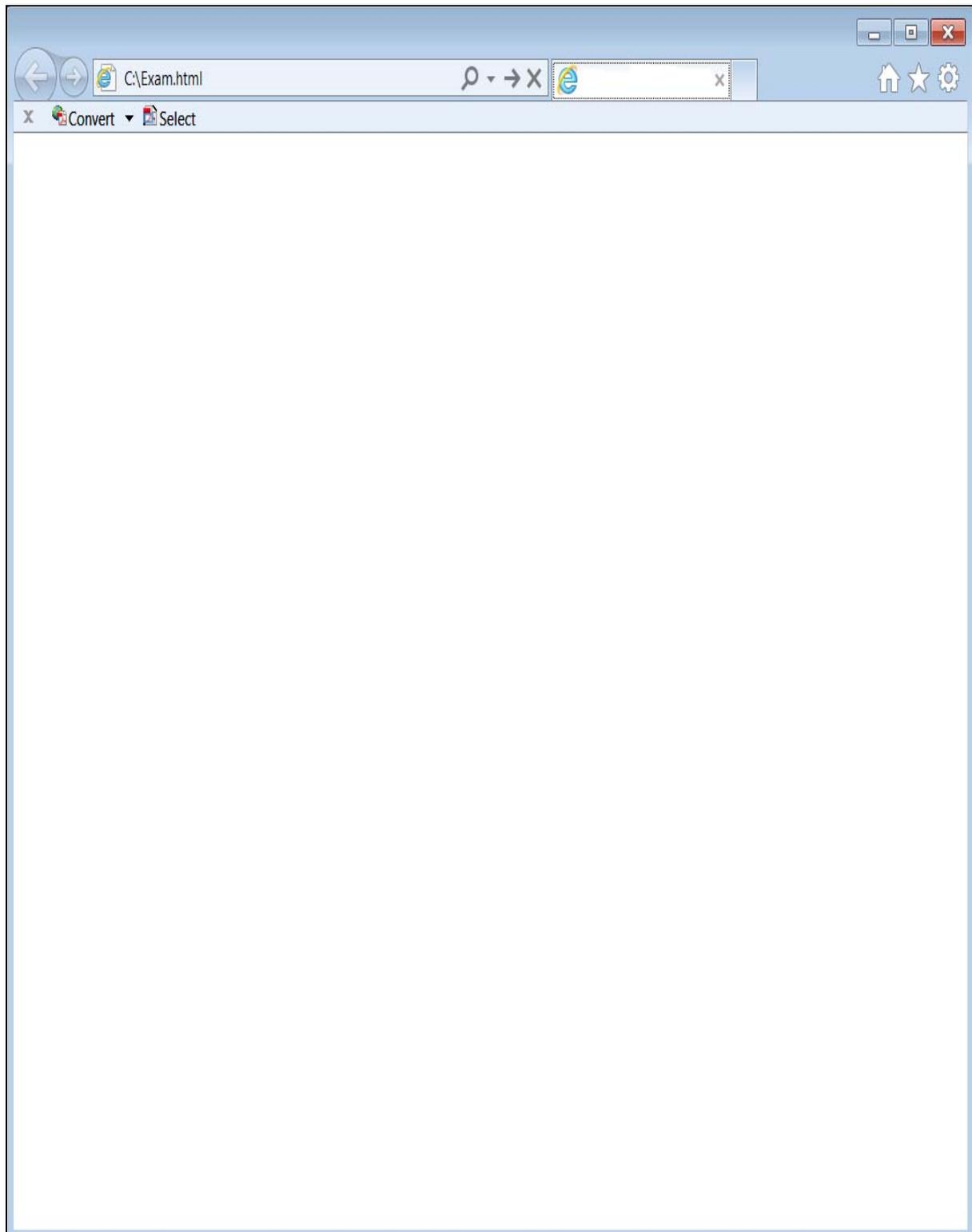
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```
C:\Exam.html                    ⌕ → X  e                    x

X   Convert  ▾  Select
```

(7 marks)

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(b) List the **three** possible locations where css styles can be defined.

(i)

(ii)

(iii)

(3 marks)

(c) Define an XHTML CSS style rule that makes **all** 2^{nd} level headings centred on the page and with a background colour of red.

(2 marks)

CONTINUED

6. Artificial Intelligence (AI) and Social Issues (8 marks)

(a) Describe **one** of the philosophical arguments against strong AI.

(3 marks)

(b) Name **two** natural language processing tasks to which AI has been applied. Would each of these applications be considered strong AI or weak AI?

(i)

(ii)

(3 marks)

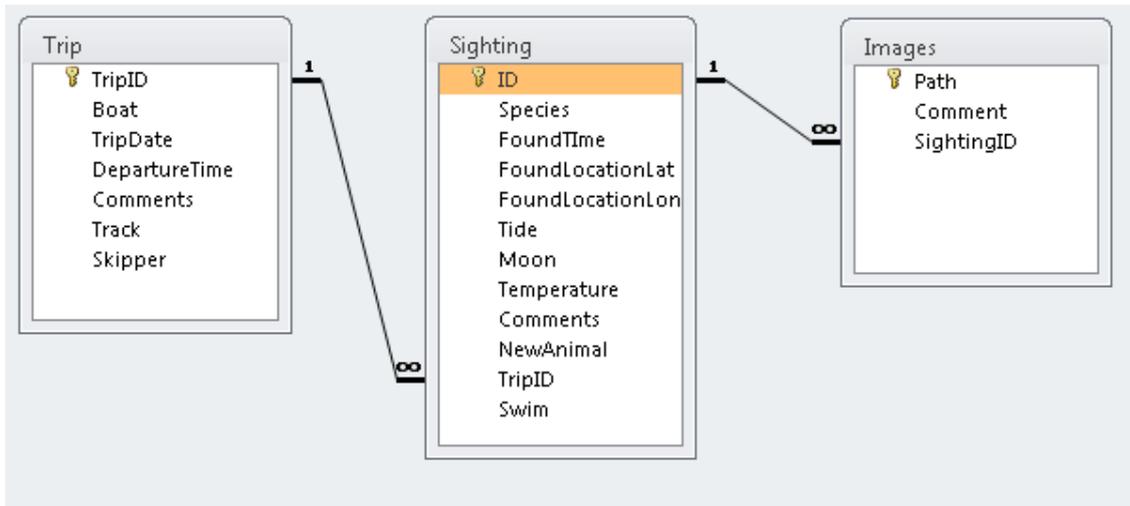(c) List **two** advantages of the Internet being anonymous.

(i)

(ii)

(2 marks)

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7. Databases (12 marks)

The following Microsoft Access relationship diagram is to be used for Parts (a) – (d) of this question.

(a) What type of relationship exists between the **Trip** table and the **Sighting** table?

(1 mark)

(b) List all of the foreign keys (if any exist) in the relationship diagram above. For each foreign key that you list, please ensure that you also state the table that the foreign key is in.

(2 marks)

(c) What is the primary key of the **Images** table?

(1 mark)

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(d) Write an SQL statement which will give the dates of all of the trips which had Paul as the skipper, making sure the dates are listed in ascending order.

(4 marks)

(e) What is a primary key? How does this relate to the concept of a foreign key?

(2 marks)

(f) Give **two** reasons why you might use a database management system instead of a spreadsheet.

(i)

(ii)

(2 marks)

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8. LaTeX (12 marks)

(a) On the following page, write the LaTeX code that will produce the following output:

Note: The file name of the triangle diagram is **triangle.png**. The diagram is in the same folder as the LaTeX document, and is to be displayed using the default width. The following commands have been included as a reference. You will not need to use all of these commands. Note that the basic document structure has been completed for you.

Normal commands	*Environments*	*Math mode commands*
\emph{}	itemize	$
\section{}	enumerate	\sum_{}^{}
\subsection{}	verbatim	\frac{}{}
\large	flushright	\sqrt{}
\textbf{}	center	\geq
\includegraphics{}	quote	\pi
\title{}	displaymath	\infty
\author{}	equation	
\date{}		^
\maketitle		_
\item		

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```
\documentclass[a4paper]{article}
\usepackage{graphicx}
\begin{document}
```

```
\end{document}
```

(8 marks)

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(b) Name **four** different classes of LaTeX documents that can be specified in a `\documentclass{}` command.

(i)

(ii)

(iii)

(iv)

(4 marks)

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- Overflow Sheet 1 -
Write the question number and letter next to your answer. You must ALSO indicate in
the allotted space that you have used the overflow sheet.

ID...…………………….

- Overflow Sheet 2 -
Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet.

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Rough Working – This page will not be marked

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Rough Working – This page will not be marked

Rough Working – This page will not be marked