ICS 4U0 **Semester 2, 2013 – 2014**

Grade 12 Computer and Information Science
Mid-Unit Quest – Introduction to C# and Review of Programming

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Victim: Mr. Solutions Well done Mr. S.!

KU	APP
24/24	15/15

1. Match each term in the left column with the ***best*** definition in the right column. **(16 KU)**

M index	A. Operators, such as &&, || and ! that are used to create compound conditions.
Q braces	B. An appliance that corrects dental irregularities. 
K assignment statement	C. Something students hate to get from their teachers.
F primitive data type	D. A method of conveying information used by "cave people."
I %	E. A function or "action" that belongs to an object.
P !	F. A data type that is not defined in terms of simpler types.
U object	G. A tangible and visible entity.
L repetition (looping)	H. Any time during which a program is being executed.
J data field (property)	I. Operator used to evaluate the remainder obtained upon dividing two integers.
S declaration	J. A variable that belongs to an object.
A conditional operators	K. A statement that is used to give a value to a variable.
E method	L. A programming structure that allows a particular group of statements to be repeated a certain number of times or while a certain condition is true.
R selection ("if")	M. A number that is used to identify a particular character of a string.
H run-time	N. The time at which the police show up and catch you in the act!
T compile	O. Any time during which a program's source code is being edited.
O design-time	P. The "not" operator used in C-style languages.
	Q. Symbols used to enclose a group of statements that are to be treated as a single statement.
	R. A programming structure that allows a particular group of statements to be executed while other groups of statements may be ignored.
	S. A statement that specifies the name, data type and other aspects of a variable.
	T. Translate a high-level program to bytecode, assembly code or machine code.
	U. Generally a collection of properties (data fields) and methods. In the .NET environment, events are also included.

2. Translate into C# assignment statements. **(8 KU)**

(a) Calculate the number of whole ***hours*** in a given number of seconds.	`hours = seconds / 3600;` ✓✓✓✓ (works as long as "hours" and "seconds" are integers)
(b) $A = \pi r^2 + \pi rs$	`coneArea = Math.PI * Math.Pow(radius, 2) + Math.PI * radius * slantHeight;` ✓✓✓

3. Consider the following C# code: **(2 APP)**

```
long b = 9;
int a = b;
```

✗

Is this valid C# code? If so, explain why. If not, explain why it isn't and make corrections.

Since implicit conversions are not allowed in C#, a "long" value (64-bit integer) cannot be assigned to an "int" variable (32-bit integer). ✓

Correction

```
int a = (int) b;
```

OR `long a = b;` OR `int b=9; int a=3;` ✓

4. Explain how the following C# code could be improved: **(3 APP)**

```
if (ferrariRadioButton.Checked)
    make = "Ferrari";
else if (lamborghiniRadioButton.Checked)
    make = "Lamborghini";
else if (bugattiRadioButton.Checked)
    make = "Bugatti";
else if (alfaRomeoRadioButton.Checked)
    make = "Alfa Romeo";
```

This should be written as 1 "if" statement with 4 clauses since only ONE of the radio buttons can be selected. ✓

Correction

```
if ( ..... )
    .....;
else if ( ..... )
    .....;
etc.
```

5. For the given code snippet, create a memory map and state the problem that is solved. **(10 APP)**

Code Snippet

Values before Entering Loop

```
// Recall that Math.Pow(2, i) means
// "2 to the exponent i." The cast
// operator (int) is needed  to force
// a conversion from "double" to "int"

int sudman=1;

for (int i=1; i<=10; i++)
{
   if (i % 2 == 0)
      sudman *= (int)Math.Pow(2,i);
}
```

Values after Exiting Loop

Memory Map

i	sudman
–	1
1	1
2	4
3	4
4	64
5	64
6	4096
7	4096
8	1048576
9	1048576
10	1073741824
–	1073741824

Happens to be 2^{30}

Problem that is Solved

By the time the loop has finished executing, the variable "sudman" stores…

the value obtained when the even powers of 2 between 1 and 10 are multiplied (i.e. $2^2 \times 2^4 \times 2^6 \times 2^8 \times 2^{10}$)