

LAB 1: Questions: **suggested answers**

Use this sheet instead of the **lab_1** assignment if you are not able to access Blackboard.

Please answer the following questions. You should refer to the program code and your observation of the program as it runs

Question 1 What are the names of the C# classes in the ClockDisplay program?

Clock and Number

Question 2 List the instance variables of Number. and their types

limit (int), value (int)

Question 3 List the instance variables of Clock, and thier types

displayString (string), hours (Number). minutes (Number)

Question 4 List the methods of Number

getDisplayValue, Increment

Question 5 List the methods of Clock

TimeTick, UpdateDisplay, Reset

Question 6 How many digits can a Number object display?

2

Question 7 How is the initial time value of the clock set?

constructor of Number sets value to 0

Question 8 What is the value of Limit for a Number object which represents hours?

24

Question 9 How many objects exist once a Clock has been created?

3 - one Clock and two Number objects. The Clock object contains references to the two Number objects

Question 10 How does the clock set up its Number components to display hours and minutes

Passes values of 24 and 60 into the constructors

Question 11 What is the purpose of the modulus, or remainder, operator (%) in the Increment method of Number?

This makes value reset to 0 when it reaches the limit. Example - if value increments to 45 then $45 \% 60 = 45$ (remainder after dividing), if value increments to 60 the $60 \% 60 = 0$, if value increments to 75 then $75 \% 60 = 15$

Question 12 What is the purpose of the if statement in the GetDisplayValue method of Number?

Selects, based on the value to be displayed, whether to pad with a leading zero to get a two digit display value

Question 13 What message needs to be sent to a clock object to make it move on by one minute?

TimerTick - method call, called by GUI

Question 14 What messages does the clock object send to to other objects?

Calls the Increment and GetDisplayValue methods of each of its Number objects

Question 15 What is the purpose of the if statement in the TimeTick method of Clock?

Selects whether to increment the hours display - need to do this if minutes display has reached max value and rolled over to zero

Question 16 Deduce the purpose of the parameters in the call to string.Format in the Update method of Clock

1. string to define format, includes characters to display and {0} and {1} as placeholders for values to be included
2&3. values to be included in the string