POWERING POTENTIAL

Quiz Questions

02 Introduction to C# Quiz Questions

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→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1:

What are Top-Level Statements?

A. A feature that allows developers to write C# statements without explicitly creating a namespace, class or static Main method as the entry point to a program.

B. A feature that ensures developers place their start up logic in a static Main method located within a class and namespace.

C. Any C# statement that invokes a function.

D. Code that lives in any kind of UI project (Console, Web or Windows Desktop).

QUIZ QUESTION 2:

?Which ones of the following are valid ways of referring to a static function called MyFunctions that lives is a component called MyComponent that is located in a namespace called MyNamespace?

a) Add "`using MyNamespace;`" to the top of the listing and then just refer to "`MyComponent.MyFunction();.`"

b) Add "`using.MyNamespace.MyComponent.MyFunction();`" to a relevant location within the code

c) Add `MyNamespace.MyComponent.MyFunction();` to a relevant location within the code

d) Add "`import MyNamespace;`" to the top of the listing and then just refer to `MyComponent.MyFunction\();`.

A. .a and b
B. .a and c
C. d and c
D. .b

QUIZ QUESTION :

Which of the following C#.NET code snippets will correctly print "Hello C#.NET"?

A.

```
import System;
namespace QA
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Hello World");
        }
    }
}
```

B.

```
using System;
namespace QA
{
    class Program
    {
        static void Main(string[] args)
        {
             WriteLine("Hello World");
        }
    }
}
```

A. .

B. .

Which of the following C#.NET code snippets will correctly print "Hello World"?

A.

```
import System;
namespace QA
{
  class Program
  {
    static void Main(string[] args)
    {
      Console.WriteLine("Hello World");
    }
  }
}
```

B.

```
using System;
namespace QA
{
  class Program
  {
    static void Main(string[] args)
    {
      WriteLine("Hello World");
    }
  }
}
```

C.

```
using System.Console;
namespace QA
{
  class Program
  {
    static void Main(string[] args)
    {
      WriteLine("Hello World");
    }
  }
}
```

D.

```
using System;
namespace QA
{
  class Program
  {
    static void Main(string[] args)
    {
      Console.WriteLine("Hello World");
    }
  }
}
```

QUIZ QUESTION 4:

What do Global Using Directives do?

A. They allow you to import a **class** for your whole application instead of just for a single file. You can add them to the top of one code file or add a <Using> item to the project file.

B. They allow you to import a **namespace** for your whole application instead of just for a single file. You can add them to the top of one code file or add a <Using> item to the project file.

C. They allow you to import a **namespace** for your whole application instead of just for a single file. You can **only** add them to the top of a single code file.

D. They allow you to import a **namespace** for your whole application instead of just for a single file. You can **only** add them as a <Using> item to the project file.

03 Variable and Datatypes Quiz Questions

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→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1:

How would you create add comments to your C# code?

A.

- Block comment: /* ..... */
- Line comment: //
- XML documentation comment: ///

B.

- Block comment: <!-- ... -->
- Line comment: //
- XML documentation comment: /* ... */

C.

- Block comment: /// ... ///
- Line comment: /*
- XML documentation comment: //

D.

- Block comment: /* ... */
- Line comment: //
- XML documentation comment: #

QUIZ QUESTION 2:

Which ones of the following are acceptable names for **public** C# variables that adhere to the recommended naming convention?

a) banana
b) Counter
c) counter
d) switch
e) firstName
f) lastname
g) dateOfBirth
h) date_of_birth

A. a, c, d, e, f, g and h

B. c, d, e and g

C. c, e and g

D. b, c, e, f, g, and h

QUIZ QUESTION 3:

Which of the following data types is best used to store financial amounts?

A. long

B. float

C. double

D. decimal

QUIZ QUESTION 4

What will be the output of the following code:

```
long x = 12;
float y = 23.582f;
z = x + y;
Console.WriteLine(z);
```

A. 34
B. 34.582
C. Compile-time error
D. Runtime error

QUIZ QUESTION 5

What will be the output of the following code:

```
long x = 12;
float y = 23.582f;
long z = x + y;
Console.WriteLine(z);
```

A. 34
B. 34.582
C. Compile-time error
D. Runtime error

Which one of the following code snippets will correctly use string interpolation to produce the following output:

My name is Dan and my C# skills are rated 9 out of 10

A.

```
string name = "Dan";
int rating = 9;
int maxValue = 10;
Console.WriteLine("My name is "
  + name + " and my C# skills are rated "
  + rating + " out of " + maxValue);
```

B.

```
string name = "Dan";
int rating = 9;
int maxValue = 10;
Console.WriteLine($"My name is " +
  $"{name} and my C# skills are rated " +
  $"{rating} out of {maxValue}");
```

C.

```
string name = "Dan";
int rating = 9;
int maxValue = 10;
Console.WriteLine(
  string.Format("My name is " +
  "{0} and my C# skills are rated " +
  "{1} out of {2}",
  name, rating, maxValue));
```

D.

```
string name = "Dan";
int rating = 9;
int maxValue = 10;
Console.WriteLine("My name is " +
"{name} and my C# skills are rated " +
"{rating} out of {maxValue}");
```

QUIZ QUESTION 7

What will the following code print to the console? ::

```
int a = 10;
int b = 20;
int c = 4;
int d = 60;
int e = 3;
int result = a + b * c - d / e;
Console.WriteLine(result);
```

A. 20
B. 70
C. -310
D. -560

QUIZ QUESTION 8

What, if anything, is wrong with the following line of code:

```
sbyte sizeOf = 300;
```

A. Nothing is wrong although it's not a very good name.
B. byte is 8-bit signed integer with a range between 0 to +255
C. sizeOf is a reserved word
D. There is no such type as byte

QUIZ QUESTION 9

What, if anything, is wrong with the following line of code:

```
short mum = 43;
```

A. Nothing is wrong.

B. Nothing is technically wrong though "mum" isn't a very good name for a data type of short

C. There is no such data type as short

D. The line should read as:
```
short mum = "43";
```

QUIZ QUESTION 10

What, if anything, is wrong with the following lines of code:

```
short mum = 53;
short hello mum;
```

A. Nothing is wrong with the code.
B. The code would compile but the variable names are poor
C. Although the variable names are poor, the code would technically compile if an assignment operator or comma token was placed between hello and mum
D. There is no need for the first line because the second line could become:
   ```
   short hello 53;
   ```

QUIZ QUESTION 11

What, if anything, is wrong with the following lines of code:

```
int big = 100000000;
long bigger = big + big + big;  / ouch /
```

A. Nothing is wrong with the code.

B. You can only add one thing at a time. The code should read:

```
int big = 100000000;
long bigger = bigger + big;
bigger = bigger + big;
```

C. The comment is badly formed. Use /* */ or //

D. Adding 3 integers of that size will cause an overflow

QUIZ QUESTION 12

What, if anything, is wrong with the following line of code:

```
double age = 78.0;
```

A. Nothing is wrong with the code.

B. The code should be altered to:
```
int age = 78.0;
```

C. The code should be altered to:
```
double age = 78;
```

D. The code will not compile because "age" is a reserved word.

QUIZ QUESTION 13

What, if anything, is wrong with the following line of code:

```
double new = 0.1;
```

A. Nothing is wrong with the code.

B. The code should be altered to:
```
String new = "0.1";
```

C. The code should be altered to:
```
double new;
0.1 = new;
```

D. The code will not compile, new is a reserved word and is illegal to use as a variable name.

QUIZ QUESTION 14

What, if anything, is wrong with the following line of code:

```
bool consequence = true;
```

A. Nothing is wrong with the code.

B. The code should be re-written as:
```
boolean consequence = True;
```

C. The code should be re-written as:
```
bool consequence = -1;
```

D. The code should be re-written as:
```
boolean consequence;
true = consequence;
```

QUIZ QUESTION 15

What, if anything, is wrong with the following line of code:

```
bool a; b; c;
```

A. Nothing is wrong with the line of code.

B. The code should be altered to read like the following:

```
boolean a;
boolean b;
boolean c;
```

C. The first 2 semicolons should be replaced by commas

D. The first 2 semicolons should be replaced by colons

QUIZ QUESTION 16

What, if anything, is wrong with the following lines of code:

```
int big = 100;
int bigger = 99;
bool max = big > bigger;
```

A. Nothing is wrong with the lines of code.

B. The code should be rewritten as the following:

```
int big = 100;
int bigger = 99;
boolean max == big > bigger;
```

C. big and bigger should be declared as boolean data types

D. max should be declared as an integer

QUIZ QUESTION 17

What, if anything, is wrong with the following line of code:

```
char maine = "american state";
```

A. Nothing is wrong with the line of code.

B. The code should be rewritten as the following because America is a proper noun:

```
char maine = "American state";
```

C. The code should be rewritten as the following:

```
string maine = 'american state';
```

D. maine has been declared as a 'char' so it can only be set to a single character inside single quotes.

04 Conditionals Quiz Questions

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QUIZ QUESTION 1

Will the "Will we see this?" message be written to the console if the following code is run?

```
int var1 = 4, var2 = 2, var3 = 0;
if ((var1 > var2) && (var3 == 0))
{
    Console.WriteLine( “Will we see this?” );
}
```

A. Yes
B. The code will run but the message will NOT be written to the console
C. The code will start to run but crash with a run time error
D. The code has a syntax error and will fail to run

QUIZ QUESTION 2

Will the "Will we see this?" message be written to the console if the following code is run?

```
int var1 = 4, var2 = 6, var3 = 0;
if ((var1 > var2) || (var3 == 0))
{
    Console.WriteLine( “Will we see this?” );
}
```

A. Yes
B. The code will run but the message will NOT be written to the console
C. The code will start to run but crash with a run time error
D. The code has a syntax error and will fail to run

QUIZ QUESTION 3

Will the "Will we see this?" message be written to the console if the following code is run?

```
int var1 = 1, var2 = 2, var3 = 3;
if ((var1 == 1) || (var2 == 2) && (var3 == 1))
{
    Console.WriteLine( “Will we see this?” );
}
```

A. Yes
B. The code will run but the message will NOT be written to the console
C. The code will start to run but crash with a run time error
D. The code has a syntax error and will fail to run

QUIZ QUESTION 4

Determine the missing parts to complete the following switch statement..

```
int day = (int)DateTime.Now.DayOfWeek;
switch (?!)
{
   case 1: case 2: case 3: case 4: case 5:
     Console.WriteLine("Week day :-(");
     break;
   case 6: case 7:
     Console.WriteLine("Weekend! :-)");
     break;
   ?2:
     Console.WriteLine("Invalid day number ;_;");
     ?3;
}
```

A. ?1 = case day, ?2 = case, ?3 = empty

B. ?1 = day, ?2 = else, ?3 = exit

C. ?1 = day, ?2 = default, ?3 = break

D. ?1 = day, ?2 = case else, ?3 = break

What will the following code print?

```
public enum TrafficLightColour
{
  Red,
  RedAndAmber,
  Green,
  Amber
}
```

```
public enum Operation
{
  Stop,
  PrepareToGo,
  GoIfTheWayIsClear,
  StopProvidedItIsSafeToDoSo
}
```

```
public static Operation GetOperation(TrafficLightColour colour) => colour switch
{
  TrafficLightColour.Red => Operation.Stop,
  TrafficLightColour.RedAndAmber => Operation.PrepareToGo,
  TrafficLightColour.Green => Operation.GoIfTheWayIsClear,
  TrafficLightColour.Amber => Operation.StopProvidedItIsSafeToDoSo,
  _ => throw new ArgumentOutOfRangeException(nameof(colour), $"Not expected colour value: {colour}"),
};

static void Main(string[] args)
{
  TrafficLightColour colour = TrafficLightColour.RedAndAmber;
  Console.WriteLine($"Traffic light colour is: {colour.ToString()}");
  Console.WriteLine($"Car operation is: {GetOperation(colour).ToString()}");
}
```

A.

- Error: Not expected colour value: ...

B.

- Traffic light colour is: RedAndAmber
- Car operation is: PrepareToGo

C.

- Code will not compile

D.

- Traffic light colour is: Red And Amber
- Car operation is: Prepare To Go

QUIZ QUESTION 5

What does the Null Coalescing Operator do and what does it look like?

A. It returns the value of its left-hand operand if it isn't null, otherwise it evaluates the right-hand operand. If the left-hand operand is non-null, the right-hand operand is not evaluated. Operator: **??**

B. It assigns the value of its right-hand operand to its left-hand operand only if the left-hand operand evaluates to null. If the left-hand operand is non-null, the right-hand operand is not evaluated. Operator: **?.**

C. It applies a member access operation to its operand only if that operand evaluates to non-null, otherwise, it returns null. Operator: **??=**

D. It assigns the value of its right-hand operand to its left-hand operand only if the left-hand operand evaluates to null. If the left-hand operand is non-null, the right-hand operand is not evaluated. Operator: **??**

05 Loops and Collections Quiz Questions

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→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

What is the output of the following code:

```
public class ArrayTest {
  public static void Main (string args[ ]) {
    int [ ] num = new int[ ]  { 20,  20, 40};
    for (int i=3; i >= 0; i--) {
      Console.WriteLine ("The value of array is " + num[i]);
    }
  }
}
```

A. The value of array is 20
   The value of array is 20
   The value of array is 40

B. The value of array is 40
   The value of array is 20
   The value of array is 20

C. There is a syntax error and the program won't compile

D. The code has a logic error and will crash when it is run

QUIZ QUESTION 2

What is the output of the following code:

```
public class ArrayTest {
  public static void Main (string[] args) {
    int [ ] num = new int[ ]  { 20,  20, 40};
    for (int i=3; i >= 0; i--) {
      Console.WriteLine ("The value of array is " + num[i]);
    }
  }
}
```

A. The value of array is 20
   The value of array is 20
   The value of array is 40

B. The value of array is 40
   The value of array is 20
   The value of array is 20

C. There is a syntax error and the program won't compile

D. The code has a logic error and will crash when it is run

QUIZ QUESTION 3

What is the output of the following code:

```
public class ArrayTest {
  public static void Main (string[] args) {
    int [ ] num = new int[ ]  { 20,  20, 40};
    for (int i=2; i >= 0; i--) {
      Console.WriteLine ("The value of array is " + num[i]);
    }
  }
}
```

A. The value of array is 20
   The value of array is 20
   The value of array is 40

B. The value of array is 40
   The value of array is 20
   The value of array is 20

C. There is a syntax error and the program won't compile

D. The code has a logic error and will crash when it is run

QUIZ QUESTION 4

What is the output of the following code:

```
int i = 0;
for(; ; )
{
  if (i < 10)
    Console.Write(i);
  else
    continue;
  i++;

}
```

A. 0123456789

B. 12345678910

C. Infinite Loop

D. Compile error

QUIZ QUESTION 5

What is the output of the following code:

```
int i = 0;
for(; ; )
{
  if (i < 10)
    Console.Write(i);
  else
    break;
  i++;

}
```

A. 0123456789

B. 12345678910

C. Infinite Loop

D. Compile error

QUIZ QUESTION 6

What is the output of the following code:

```
static void Main(string[] args)
{
  PrintGreeting();
}

static bool PrintGreeting()
{
  Console.Write("Hello");
  return false;
}
```

A. Compile-time error
B. Runtime error
C. Hello
D. No output

QUIZ QUESTION 7

What is the output of the following code:

```
int i = 1, n = 5, product;
do
{
  product = n * i;
  Console.WriteLine("{0} * {1} = {2}", n, i, product);
  i++;
} while (i <= 5 && n < 5);
```

A. 5 * 1 = 5
   5 * 2 = 10
   5 * 3 = 15
   5 * 4 = 20
   5 * 5 = 25

B. 5 * 1 = 5

C. The code will run but will not output anything to the console

D. The code will not compile because of a syntax error

QUIZ QUESTION 8

What is the output of the following code:

```
int i = 1, n = 5, product;
do
{
  product = n * i;
  Console.WriteLine("{0} * {1} = {2}", n, i, product);
  i++;
} while (i <= 5 && n <= 5)
```

A. 5 * 1 = 5
   5 * 2 = 10
   5 * 3 = 15
   5 * 4 = 20
   5 * 5 = 25

B. 5 * 1 = 5

C. The code will run but will not output anything to the console

D. The code will not compile because of a syntax error

QUIZ QUESTION 9

What is the output of the following code:

```
int i = 1, n = 5, product;
while (i <= 5 && n < 5)
{
  product = n * i;
  Console.WriteLine("{0} * {1} = {2}", n, i, product);
  i++;
}
```

A. 5 * 1 = 5
   5 * 2 = 10
   5 * 3 = 15
   5 * 4 = 20
   5 * 5 = 25

B. 5 * 1 = 5

C. The code will run but will not output anything to the console

D. The code will not compile because of a syntax error

QUIZ QUESTION 10

What is the output of the following code:

```
List<int> marks = new List<int> { 10, 20, 35, 50 };
foreach (int num in marks)
{
  num = num * 2;
}

foreach (int num in marks)
{
  Console.WriteLine(num);
}
```

A. 20
   40
   70
   100

B. 10
   20
   35
   50

C. The code will run but will not output anything to the console

D. The code will not compile because of a syntax error

QUIZ QUESTION 11

What is the output of the following code:

```
List<int> integers = new () { 1, 1, 2, 3, 5, 8, 13, 21 };
foreach (int i in integers)
{
  Console.Write(i * 2 + " ");
}
```

A. 2 2 4 6 10 16 26 42
B. The code will run but will not print anything
C. The code will run but will trigger a run time error
D. The code will not compile because of a syntax error

QUIZ QUESTION 12

What will be the output of the following code:

```
Dictionary<int, string> numberNames = new Dictionary<int, string>();
numberNames.Add(1, "One"); //adding a key/value using the Add() method
numberNames.Add(2, "Two");
numberNames.Add(3, "Three");
numberNames.Add(3, "Three");

foreach (KeyValuePair<int, string> kvp in numberNames)
  Console.WriteLine("Key: {0}, Value: {1}", kvp.Key, kvp.Value);
```

A. Key: 1, Value: One
   Key: 2, Value: Two
   Key: 3, Value: Three

B. Key: 1, Value: One
   Key: 2, Value: Two
   Key: 3, Value: Three
   Key: 3, Value: Three

C. The code will run but will trigger a run time error

D. The code will not compile because of a syntax error

07 Methods Quiz Questions

→ Enter:

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→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

Which one of the possible answers will produce a syntax error when attempting to call the following method?:

```
public class Parrot
{
  public void Talk(string text, int numTimes, Boolean includeSquark)
      {...}
}
```

A.
```
Parrot polly = new Parrot();
polly.Talk("Who's a pretty boy", 2, true);
```

B.
```
Parrot polly = new Parrot();
polly.Talk(text: "Who's a pretty girl", 2, includeSquark: true);
```

C.
```
Parrot polly = new Parrot();
polly.Talk(numTimes: 2, text: "Polly wants a cracker",  true);
```

D.
```
Parrot polly = new Parrot();
polly.Talk(numTimes: 2, includeSquark: true, text:"Hello");
```

Q2: Which one of the following snippets of code will **NOT** produce a syntax or runtime error?:

A.
```
public class Parrot {
    public void Talk(string text = "Hello", int numTimes = 1, Boolean includeSquark) {...}}

Parrot polly = new Parrot();
polly.Talk("Who's a pretty boy", includeSquark: true);
```

B.
```
public class Parrot {
    public void Talk(string text = "Hello", int numTimes = 1, Boolean includeSquark) {...}}

Parrot polly = new Parrot();
polly.Talk(numTimes: 2, text: "Polly wants a cracker",  true);
```

C.
```
public class Parrot {
    public void Talk(string text = "Hello", int numTimes = 1, Boolean includeSquark) {...}}

Parrot polly = new Parrot();
polly.Talk("Who's a pretty boy", includeSquark: true);
```

D.
```
public class Parrot {
    public void Talk(string text="Hello", int numTimes=1, Boolean includeSquark=false) {...}}

Parrot polly = new Parrot();
polly.Talk(numTimes=3, talk="Pretty Polly");
```

Q3: Which one of the following snippets of code will **NOT** produce a syntax or runtime error?:

A.
```
int i = 10;
MyOverloadedMethod(i);
…
static void MyOverloadedMethod(int i){
  Console.WriteLine($"i is an integer and has a value of {d}");}
static void MyOverloadedMethod(Int32 myInt){
  Console.WriteLine($"myInt is an integer and has a value of {myInt}");}
```

B.
```
int i = 10;
MyOverloadedMethod(i);
…
static void MyOverloadedMethod(double d){
  Console.WriteLine($"d is an double and has a value of {d}");}
static void MyOverloadedMethod(object o){
  Console.WriteLine($"o is a {o.GetType()} and has a value of {o}");}
```

C.
```
int i = 10;
MyOverloadedMethod(i);
…
static void MyOverloadedMethod(int i){
  Console.WriteLine($"i is an integer and has a value of {d}");}
static string MyOverloadedMethod(int i){
  return $"i is an integer and has a value of {d}";}
```

D.
```
long i = 10;
MyOverloadedMethod(i);
…
static void MyOverloadedMethod(int i, int j = 0) {
  Console.WriteLine($"i and j are integers. i = {i}, j = {j}"); }
static void MyOverloadedMethod(int d) {
  Console.WriteLine($"d is an integer and has a value of {i}");}
```

QUIZ QUESTION 4

Which one of the possible answers produces output that is exactly the same as the code given below?:

```
public static class Clock {
  public static string AMPM(int hr){
    hour = Mod(hr);
    if (hr < 12)
      return "AM";
    else
      return "PM";
  }
  static int Mod(int hr){
    hr = hr % 24;
    return hr < 0 ? hr + 24 : hr;
  }
}
```

A.
```
public static string AMPM(int hr) ->
  (hr % 24 < 0 ? (hr % 24 + 24) : hr % 24) < 12 ? "AM" : "PM";
```

B.
```
public static string AMPM(int hr) =>
  (hr % 24 < 0 ? (hr % 24 + 24) : hr % 24) < 12 ? "AM" : "PM";
```

C.
```
public static string AMPM(int hr) => Mod(hr) < 12 iif "AM" else "PM";
static int Mod(int hr) => hr % 24 < 0 iif hr % 24 + 24 else hr % 24;
```

D.
```
public static string AMPM(int hr) => {
  (hr % 24 < 0 ? (hr % 24 + 24) : hr % 24) < 12 ? "AM" : "PM"; }
```

QUIZ QUESTION 5

What will be printed when the following piece of code is run?:

```
public static class Clock {
 private static void MyFunc(ref int parm1, int parm2, out int parm3){
   parm1++;
   parm2++;
   parm3 = 13;}

 static void Main(string[] args){
   int a = 10;
   int b = 11;
   int c = 100;
   MyFunc(ref a, b, out c);
   Console.WriteLine($"a: {a}, b: {b}, c: {c}");}}
```

A. a: 11, b: 11, c: 13

B. The code will not run because of syntax errors

C. a: 10, b: 12, c: 13

D. a: 11, b: 12, c: 100

Q6: What will the following code output to the Console??:

A.
```
static void Main(string[] args) {
  Car c = new Car("Ford", "Fiesta");
  ChangeCarByValue(c);
  Console.WriteLine($"After changing by value: {c}");
  ChangeCarByReference(ref c);
  Console.WriteLine($"After changing by ref: {c}");
}

static void ChangeCarByValue(Car c){
   c.Make = "AUDI";
   c.Model = "TT"; }

static void ChangeCarByReference(ref Car c){
  c.Make = "BMW";
  c.Model = "Z4"; }
```

B.
```
After changing by value: Car: FORD FIESTA
After changing by ref: Car: BMW Z4
```

B.
```
After changing by value: Car: FORD FIESTA
After changing by ref: Car: FORD FIESTA
```

C.
```
After changing by value: Car: AUDI TT
After changing by ref: Car: BMW Z4
```

D.
```
After changing by value: Car: AUDI TT
After changing by ref: Car: FORD FIESTA
```

08 Properties and Constructors Quiz Questions

→ Enter:

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→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

A class called GolfClub (‘group of members’ not a ‘stick’) needs to keep track of the following:

A club's Location (date type string) - assume clubs will never be relocated to a new location

The NumberOfMembers (data type int) a club has - settable each year but is not validated

The TotalExpectedCosts (data type decimal) for a year of a club - settable each year but increase can’t go up more than 5%pa

The annual Subscription (data type int, to nearest lower £) members will need to pay - calculated as the total costs / the number of members

Assuming the golf club will never move how should its location be managed within the class?

A.
```
private string location;
public string Location {
  get{return location;}
  set{location = value;}
}
```

B.
```
private string location;
```

C.
```
public string location;
```

D.
```
public string Location {get; private set;}
```

Q2:

A class called GolfClub (‘group of members’ not a ‘stick’) needs to keep track of the following:

A club's Location (date type string) - assume clubs will never be relocated to a new location

The NumberOfMembers (data type int) a club has - settable throughout year but is not validated

The TotalExpectedCosts (data type decimal) for a year of a club - settable each year but increase can’t go up more than 5%pa

The annual Subscription (data type int, to nearest lower £) members will need to pay - calculated as the total costs / the number of members

Assuming the number of members is set as and when but needs no validation, how should it be managed within the class?

A.
```
private NumberOfMembers{get; set;}
```

B.
```
private string numberOfMembers;
public string NumberOfMembers
{
  get{return numberOfMembers}
  set{numberOfMembers = value;}
}
```

C.
```
public NumberOfMembers{ get; set;}
```

D.
```
public NumberOfMembers
{
  get;
  private set;
}
```

Q3:

A class called GolfClub (‘group of members’ not a ‘stick’) needs to keep track of the following:

A club's Location (date type string) - assume clubs will never be relocated to a new location

The NumberOfMembers (data type int) a club has - settable each year but is not validated

The TotalExpectedCosts (data type decimal) for a year of a club - settable each year but increase can’t go up more than 5%pa

The annual Subscription (data type int, to nearest lower £) members will need to pay - calculated as the total costs / the number of members

The total value of all the expected costs for the year needs to be settable but is not allowed to increase by more than 5% per annum.

How would the class best manage this value?

A.
```
public decimal TotalExpectedCosts {get; set;}
```

B.
```
private decimal totalExpectedCosts public decimal;
TotalExpectedCosts
{
  get{return totalExpectedCosts;}
  set
  {
    if (value <= totalExpectedCosts * 1.05M)
      {totalExpectedCosts = value;}
  }
}
```

C.
```
private decimal totalExpectedCosts;
public decimal TotalExpectedCosts
{
    get{return totalExpectedCosts;}
}
```

D.
```
public decimal TotalExpectedCosts;
```

Q4:

A class called GolfClub (‘group of members’ not a ‘stick’) needs to keep track of the following:

A club's Location (date type string) - assume clubs will never be relocated to a new location

The NumberOfMembers (data type int) a club has - settable each year but is not validated

The TotalExpectedCosts (data type decimal) for a year of a club - settable each year but increase can’t go up more than 5%pa

The annual Subscription (data type int, to nearest lower £) members will need to pay - calculated as the total costs / the number of members

The subscription for golf club membership is calculated by the total costs divided by the number of members and can be rounded down to the nearest pound). How would this be best managed in the class?

A.
```
private string subscription;
public int Subscription {
  get { return subscription; }
}
```

B.
```
private string subscription;
public int Subscription {
  get
    { return (int)(TotalExpectedCosts / NumberOfMembers); }
  set
    { subscription = value; }
}
```

C.
```
public int Subscription {
  set
    { return (int)(TotalExpectedCosts / NumberOfMembers); }
}
```

D.
```
public int Subscription {
  get {return (int)(TotalExpectedCosts / NumberOfMembers); }
}
```

Q5: Which one of the following lines of code that attempt to instantiate a Car object is correct?

A.
```
public class Car {
  public string make { get; set; }
  public string model { get; set; }
  public Car(string make, string model)
  {
    make = make;
    model = model;
  }
}
//Client code:
Car car = new Car("Ford", "Fiesta");
```

B.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
  public void Car(string make, string model)
  {
    Make = make;
    Model = model;
  }
}
//Client code:
Car car = new Car("Ford", "Fiesta");
```

C.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
  public Car(string make, string model)
  {
    Make = make;
    Model = model;
  }
}
//Client code:
Car car = new Car("Ford", "Fiesta");
```

D.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
 public Car(string make, string model)
 {
    Make = make;
    Model = model;
  }
}
//Client code:
Car car = new Car();
```

Q6: Which one of the following lines of code that attempt to instantiate a Car object is **incorrect**?

A.
```
public class Car {
  public string make { get; set; }
  public string model { get; set; }
  public Car()
  {

  }
}
//Client code:
Car car = new Car("Ford", "Fiesta");
```

B.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
}
//Client code:
Car car = new Car();
car.Make = "Ford";
car.Model = model;
```

C.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
  public Car()
  {

  }
}
//Client code:
Car car = new Car(){Make:"Ford", Model:"Fiesta"};
```

D.
```
public class Car {
  public string Make { get; set; }
  public string Model { get; set; }
  public Car()
  {

  }
}
//Client code:
Car car = new Car{Make:"Ford", Model:"Fiesta"};
```

08 Inheritance and Abstract Classes
Quiz Questions

→ Enter:

http://tick.qaalabs.com/CSharpQuiz

→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

Q1:

Consider the following code:

```
public class Person {
    public string Name { get; set; }
}

public class Student : Person {
    public string Course { get; private set; }
    public string TermAddress { get; set; }
}

public class Teacher : Person {
    public string[] Specialisms { get; private set; }
}

public class Administrator : Person {
    public string Department { get; private set; }
}

class Program {
    static void Main(string[] args){
        Student s = new Student();
        s.Name = ""Jane Smith"";
        s.TermAddress = ""5 Park Way, Stirchley"";
        s.Department = ""Computer Science"";
    }
}
```

Which one of the lines of client code will cause a build error?

A. `Student s = new Student();`

B. `s.Name = "Jane Smith";`

C. `s.TermAddress = "5 Park Way, Stirchley";`

D. `s.Department = "Computer Science";`

Q2:

What will be the output of the following code:

```
public class Animal
{
 public int LimbCount { get; set; } = 3;
 public string Display()
 {
   return $"I am an animal with {LimbCount} limbs";
 }
}
public class Dog: Animal
{
 public string Name { get; set; } = "Fido";
 public string Display()
 {
   return
     $"I am a dog called {Name} and I have {LimbCount} limbs";
 }
}

public static class Program
{
 static void Main(string[] args)
 {
   Dog dog = new Dog { LimbCount = 4, Name = "Rover" };
   Console.WriteLine(dog.Display());
 }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am an animal with 4 limbs
   I am a dog called Rover and I have 4 limbs

D. I am a dog called Fido and I have 3 limbs

Q3:

What will be the output of the following code:

```
public class Animal
{
 public int LimbCount { get; set; } = 3;
 public string Display()
 {
   return $"I am an animal with {LimbCount} limbs";
 }
}
public class Dog: Animal
{
 public string Name { get; set; } = "Fido";
 public string Display()
 {
   return
     $"I am a dog called {Name} and I have {LimbCount} limbs";
 }
}

public static class Program
{
 static void Main(string[] args)
 {
   Animal dog = new Dog { LimbCount = 4, Name = "Rover" };
   Console.WriteLine(dog.Display());
 }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am an animal with 3 limbs

D. I am a dog called Fido and I have 3 limbs

Q4:

What will be the output of the following code:

```
public class Animal
{
 public int LimbCount { get; set; } = 3;
 public virtual string Display()
 {
   return $"I am an animal with {LimbCount} limbs";
 }
}
public class Dog: Animal
{
 public string Name { get; set; } = "Fido";
 public string Display()
 {
   return
     $"I am a dog called {Name} and I have {LimbCount} limbs";
 }
}

public static class Program
{
 static void Main(string[] args)
 {
   Animal dog = new Dog { LimbCount = 4, Name = "Rover" };
   Console.WriteLine(dog.Display());
 }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am an animal with 3 limbs

D. Error

Q5:

What will be the output of the following code:

```
public class Animal
{
 public int LimbCount { get; set; } = 3;
 public virtual string Display()
 {
   return $"I am an animal with {LimbCount} limbs";
 }
}
public class Dog: Animal
{
 public string Name { get; set; } = "Fido";
 public override string Display()
 {
   return
     $"I am a dog called {Name} and I have {LimbCount} limbs";
 }
}

public static class Program
{
 static void Main(string[] args)
 {
   Animal dog = new Dog { LimbCount = 4, Name = "Rover" };
   Console.WriteLine(dog.Display());
 }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am an animal with 3 limbs

D. Error

Q6:

What will be the output of the following code:

```
public class Animal
{
 public int LimbCount { get; set; } = 3;
 public string Display()
 {
   return $"I am an animal with {LimbCount} limbs");
 }
}
public class Dog: Animal
{
 public string Name { get; set; } = "Fido";
 public virtual string Display()
 {
   return
     $"I am a dog called {Name} and I have {LimbCount} limbs";
 }
}

public static class Program
{
 static void Main(string[] args)
 {
   Animal dog = new Dog { LimbCount = 4, Name = "Rover" };
   Console.WriteLine(dog.Display());
 }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am an animal with 3 limbs

D. Error

Q6:

What will be the output of the following code:

```
public class Animal {
 public int LimbCount { get; set; } = 3;
 public string Display() {
   return $"I am an animal with {LimbCount} limbs"; }
}

public class Dog: Animal {
 public string Name { get; set; } = "Fido";
 public virtual string Display() {
   return $"I am a dog called {Name} and I have {LimbCount} limbs"; }
}

public class Staffie : Dog {
 public int TailWagSpeed { get; set; } = 92;
 public override string Display() {
   return base.Display()
     + $" and a tail wag speed of {TailWagSpeed} wpm"; }
}

public static class Program {
 static void Main(string[] args) {
   Dog dog = new Staffie {
      LimbCount = 4, Name = "Rover", TailWagSpeed = 88 };
   Console.WriteLine(dog.Display());}
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am a dog called Rover and I have 4 limbs and a tail wag speed of 88 wpm

D. Error

Q8:

What will be the output of the following code:

```
public class Animal {
 public int LimbCount { get; set; } = 3;
 public string Display() {
   return $"I am an animal with {LimbCount} limbs"; }
}

public class Dog: Animal {
 public string Name { get; set; } = "Fido";
 public virtual string Display() {
   return $"I am a dog called {Name} and I have {LimbCount} limbs"; }
}

public class Staffie : Dog {
 public int TailWagSpeed { get; set; } = 92;
 public override string Display() {
   return base.Display()
     + $" and a tail wag speed of {TailWagSpeed} wpm"; }
}

public static class Program {
 static void Main(string[] args) {
   Animal dog = new Staffie {
      LimbCount = 4, Name = "Rover", TailWagSpeed = 88 };
   Console.WriteLine(dog.Display()); }
}
```

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am a dog called Rover and I have 4 limbs and a tail wag speed of 88 wpm

D. Error

Q10:

What will be the output of the following code:

```
public abstract class Animal {
 public int LimbCount { get; set; } = 3;
 public abstract string Display(); }

public class Dog: Animal {
 public string Name { get; set; } = "Fido";
 public string Display() {
   return $"I am a dog called {Name} and I have {LimbCount} limbs"; }
}

public class Staffie : Dog {
 public int TailWagSpeed { get; set; } = 92;
 public string Display() {
   return base.Display()
     + $" and a tail wag speed of {TailWagSpeed} wpm"; }
}

public static class Program {
 static void Main(string[] args) {
   Animal dog = new Staffie {
      LimbCount = 4, Name = "Rover", TailWagSpeed = 88 };
   dog.Display(); }
}
```

Animal

A. I am an animal with 4 limbs

B. I am a dog called Rover and I have 4 limbs

C. I am a dog called Rover and I have 4 limbs and a tail wag speed of 88 wpm

D. Error

09 Interfaces
Quiz Questions

→ Enter:

http://tick.qaalabs.com/CSharpQuiz

→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

Q1:

When run what will be the output of the following code?

```
interface ILetterMaze {
  void A();
  void B();
  void C();
  void D();}

public abstract class LM : ILetterMaze {
  public abstract void A();
  public void B() { Console.WriteLine("I am base B"); }
  public void C() { Console.WriteLine("I am base C"); }
  public virtual void D() { Console.WriteLine("I am base D"); } }

class DLM : LM {
  public override void A() { Console.WriteLine("I am derived A"); }
  public new void B() { Console.WriteLine("I am derived B"); }
  public override void D() { Console.WriteLine("I am derived D"); } }

class Program {
  public static void Main(string[] args) {
    ILetterMaze a = new DLM();
    a.A();
    a.B();
    a.C();
    a.D(); }
}
```

A.
```
I am derived A
I am base B
I am base C
I am derived D
```

B.
```
I am derived A
I am derived B
I am base C
I am derived D
```

C.
```
I am base A
I am base B
I am base C
I am base D
```

D. Error

10 Delegates and Lamdas Quiz Questions

→ Enter:

http://tick.qaalabs.com/CSharpQuiz

→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

Given the following code:

```
class Utils {
   public int CountWords(string s) {
     MatchCollection collection = Regex.Matches(s, @"[\S]+");
     return collection.Count; }
}
```

Which one of the following is a valid way of calling the CountWords function?

A.
```
public delegate int del(string s);

   static void Main(string[] args) {
     Utils utils = new Utils();
     del d = new del(utils.CountWords);
     int numWords = d("The world has gone completely mad!");
   }
```

B.
```
string sentence = "The world has gone completely mad!";
int numWords = CountWords(sentence);
```

C.
```
string sentence = "The world has gone completely mad!";
int numWords = Utils.CountWords(sentence);
```

D.
```
public Delegate del = new Delegate( int i, string s );

   static void Main(string[] args) {
     Utils utils = new Utils();
     del d = new del(utils.CountWords);
     int numWords = d("The world has gone completely mad!");
   }
```

QUIZ QUESTION 2

Given the following piece of code:

```
int x = 3;
if (isPositive(x)) { Console.WriteLine($"{x} is positive!"); };
```

Which one of the following expressions would be an appropriate declaration for the isPositive function?

A. `Func<bool> isPositive = int x => x >= 0;`

B. `Func<bool> isPositive = int x => return x >= 0;`

C. `Func<bool, int> isPositive = x => x >= 0;`

D. `Func<int, bool> isPositive = x => x >= 0;`

Q3: Given the following code and the fact that the Car type supports both Make and Model properties. How would you utilise the FindCars method to return all the "Fiestas" in the cars collection?

```
static List<Car> FindCars(List<Car> cars, Func<Car, bool> func)
{
  List<Car> filteredCars = new List<Car>();
  foreach (Car car in cars)
  {
    if (func(car)) { filteredCars.Add(car); }
  }
  return filteredCars;
}
```

A. `List<Car> fiestas = FindCars(cars, foreach(c => cars.Model == "Fiesta");`

B. `List<Car> fiestas = FindCars(cars, c => return (c.Model == "Fiesta"));`

C. `List<Car> fiestas = FindCars(cars, "Fiesta");`

D. `List<Car> fiestas = FindCars(cars, c => c.Model == "Fiesta");`

11 LINQ
Quiz Questions

→ Enter:

http://tick.qaalabs.com/CSharpQuiz

→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

What is the output of the following code ?

```
string[] colors = { "green", "brown", "blue", "red" };
Console.WriteLine(colors.Max(c => c.Length));?
```

A. 5

B. 4

C. green

D. brown

QUIZ QUESTION 2

Given the following code, what is the data type of the query variable?

```
string[] fruit = { "grapes", "apples", "pears", "cherries" };
var query =
  from f in fruit
  where f.Length > 5
  select f;
```

A. IQueryable<string>

B. string

C. IEnumerable<string>

D. IEnumerable<int>

QUIZ QUESTION 3

What does the following example output?

```
string[] fruit = { "grapes", "cherries", "apples", "pears",  "apricots"
};
var list = new List<string> (fruit);
IEnumerable<string> query = list.Where (c => c.Length == 6);
list.Remove ("grapes");

Console.WriteLine (query.Count());
```

A. 0

B. 1

C. 2

D. Exception

QUIZ QUESTION 4

What does the following example output?

```
string[] fruit = { "grapes", "cherries", "apples", "pears",  "apricots"
};
var list = new List<string> (fruit);
IEnumerable<string> query = list.Where (c => c.Length == 6).ToList();
list.Remove ("grapes");

Console.WriteLine (query.Count());
```

A. 0

B. 1

C. 2

D. Exception

QUIZ QUESTION 5

Given a Car class has Make, Model and Registration properties and the following code, how would you filter the collection to return all cars that are Fords in reverse alphabetical sequence of their registrations?

```
List<Car> cars = new(){
    new Car("Ford", "Mondeo", "AB12 ABC"),
    new Car("AUDI", "TT", "AU01 TT0"),
    new Car("Ford", "Fiesta", "FF10 ILF"),
    new Car("Ford", "Fiesta", "JB00 OOT") };
```

A.
```
IEnumerable<Car> fords = from car in cars
  where car.Make == "Ford"
  orderbydescending car.Registration
  select car;
```

B.
```
IEnumerable<Car> fords = cars
  .Where(c => c.Make == "Ford")
  .OrderByDescending(c => c.Registration);
```

C.
```
IEnumerable<Car> fords = from cars
  where car.Make == "Ford"
  orderby car.Registration descending
  select car;
```

D.
```
IEnumerable<Car> fords = cars
  .Where(c => c.Make == "Ford")
  .OrderByDescending(c => c.Registration)
  .Select(c => new { c.Make, c.Model, c.Registration })
```

12 Exception Handling Quiz Questions

→ Enter:

http://tick.qaalabs.com/CSharpQuiz

→ Enter your name in the appropriate box

→ Click the A, B, C or D buttons to enter your answers to the following questions

QUIZ QUESTION 1

Q1: What will the following code output when run?

```
class program
{
    public static void Main(string[] args)
     {
         try
         {
             throw new NullReferenceException("C");
             Console.WriteLine("A");
         }
         catch (ArithmeticException e)
         {
             Console.WriteLine("B");
         }
         Console.ReadLine();
     }
}
```

A. A

B. B

C. Compile time error

D. Runtime error

Q2: What will the following code output when run?

```
class Program {
  public static void Main(string[] args) {
   try {
     int p = 2;
     int q = 11 / p;
     try {
       if (p == 2)
         p = p / p - p;
       if (p != 0) {
         int[] r = { 1 };
         r[7] = q;
         r[8] = p;
       }
     }
     finally {
       Console.WriteLine("X");
     }
   }
   catch (IndexOutOfRangeException exn) {
     Console.WriteLine("Y");
   }
   Console.ReadLine();
 }
}
```

A. X
   Followed by a run time exception

B. Y

C. X
   Y

D. X

Q3: **You're the in-house TDD unit test expert. You've been asked to review the following xUnit unit test which currently passes successfully when run:**

```
using System;
using Xunit;
namespace QA.Utils.Tests
{
    public class MathToolsTest
    {
        [Fact] void Divide_ByZero_ThrowsArgumentException()
        {
            Assert.Throws<ArgumentException>(() => MathTools.Divide(3, 0));
        }
    }
}
```

Which of the following statements correctly describes the intention of this unit test?

A. The unit test is making sure that the "Divide" method throws an ArgumentException when an attempt is made to divide by 0

B. The unit test is making sure that the "Divide" method does not throw an ArgumentException when an attempt is made to divide by 0

C. The unit test is making sure that the "Divide" method returns 0 when an attempt is made to divide by 0

D. The unit test is making sure that the "Divide" method returns 42 when an attempt is made to divide by 0

Q4: You've been tasked with reviewing the following code and unit tests developed by some else for the company's financial system.

//Application (class under test):

```
using System;
namespace QA.Utils {
  public class MathTools {
    public static double convertToDecimal(int numerator, int denominator) {
      if (denominator > 0) {
        throw new ArgumentException("Denominator must not be 0");
      }
      return (double)numerator / (double)denominator;
    }
  }
}
```

//Unit Tests:

```
using System;
using Xunit;
namespace QA.Utils.Tests {
  public class MathToolsTest
  {
    [Fact] //TEST1
    void TestConvertToDecimalSuccess() {
      double result = MathTools.convertToDecimal(3, 4);
      Assert.Equal(0.75, result);
    }
    [Fact] //TEST2
    void TestConvertToDecimalInvalidDenominator() {
      Assert.Throws<ArgumentException>(() => MathTools.convertToDecimal(3, 0));
    }
  }
}
```

When the unit tests are executed, which one of the following outcomes will occur?

A. Both tests will pass successfully

B. TEST1 will pass and TEST2 will fail

C. TEST1 will fail and TEST2 will pass

D. Both tests will fail