

浙江理工大学 2020—2021 学年第 2 学期

《C# Programming》期末试卷

本人郑重承诺：本人已阅读并且透彻地理解《浙江理工大学考场规则》，愿意在考试中自觉遵守这些规定，保证按规定的程序和要求参加考试，如有违反，自愿按《浙江理工大学学生违纪处分规定》有关条款接受处理。

承诺人签名(Name): _____ 学号(ID): _____ 班级(Class): _____

1, Read each question carefully and select the answer or answers that represent the best solution to the problem. (30 points)

(1) Consider the following two C# code segments:

Segment 1

```
int i = 0;
while ( i < 20 )
{
    ++i;
    Console.WriteLine ( i );
}
```

Segment 2

```
for (int i=0; i <= 20; ++i)
{
    Console.WriteLine ( i );
}
```

Which of the following statements is true?

- A、 The output from these segments is not the same.
- B、 The scope of the control variable i is different for the two segments.
- C、 Both (a) and (b) are true.
- D、 Neither (a) nor (b) is true.

(2) Which of the following simple types should be used for monetary values?

- A、 double
- B、 float
- C、 int
- D、 decimal

(3) Which of the following describes a static variable?

- A、 a variable with one copy shared by all class objects
- B、 a variable whose value may not be changed
- C、 all of the above
- D、 None of the above.

(4) Which of the following statements about arrays are true?

- a) An array is a group of variables that all have the same type.
- b) Elements are located by index or subscript.
- c) The length of an array c is determined by the expression c.Length.
- d) The zeroth element of array c is specified by c[0].

- A、 a, c, d.
- B、 a, b, d.
- C、 c, d.
- D、 a, b, c, d.

(5) Which function is called when an object is used where a string should be?

- A、 TranslateToString()
- B、 String()
- C、 ConvertToString()
- D、 ToString()

- (6) Having a this reference allows:
- A、 A method to refer explicitly to the instance variables and other methods of the object on which the method was called.
 - B、 A method to refer implicitly to the instance variables and other methods of the object on which the method was called.
 - C、 An object to reference itself.
 - D、 All of the above.
- (7) Composition:
- A、 Is a form of software reuse.
 - B、 Is using an object reference as a class member.
 - C、 Is a good design practice.
 - D、 All of the above.
- (8) The default Equals implementation determines:
- A、 whether two references refer to the same object in memory.
 - B、 whether two references have the same type.
 - C、 whether two objects have the same instance variables.
 - D、 whether two objects have the same instance variable values.
- (9) When a derived-class member overrides a base-class member, the base-class member can be accessed from the derived-class by using the keyword _____ .
- A、 base
 - B、 top
 - C、 super
 - D、 None of the above
- (10) Overriding a method differs from overloading a constructor because:
- A、 For an overloaded constructor, the base class constructor will always be called first.
 - B、 For an overridden constructor, the base class constructor will always be called first.
 - C、 Overloaded methods have the same signature.
 - D、 Overridden methods have the same signature.
- (11) All of the following methods are implicitly sealed except:
- A、 a method in an abstract class.
 - B、 a private method.
 - C、 a method declared in a sealed class.
 - D、 static method.
- (12) The purpose of an interface is to:
- A、 provide similar objects with the same functionality, even though each will implement the functionality differently
 - B、 provide different types of objects with the comparable functionality, even though each will implement the functionality differently
 - C、 provide default implementations of methods and properties
 - D、 None of the above.
- (13) The range variable is implicitly defined in the _____ clause and used to produce results in the _____ clause
- A、 where, put
 - B、 from, put
 - C、 from, select
 - D、 where, select
 - E、 in, foreach

- (14) Suppose you want to make a Recipe class to store cooking recipes and you want to sort the Recipes by the MainIngredient property. In that case, which of the following interfaces would probably be most useful?
- A、IDisposable B、IComparable
C、IComparer D、ISortable
- (15) You are developing an application that includes the following code segment. (Line numbers are included for reference only.)
- ```
1 string sLine = Console.ReadLine();
2 int number;
3
4 { return false; }
5 else
6 { val = number; return true; }
```
- You need to ensure that the application accepts only integer input and prompts the user each time non-integer input is entered.
- Which code segment should you add at line 3?
- A. If (!int.TryParse(sLine, out number))  
B. If ((number = Int32.Parse(sLine)) == Single.NaN)  
C. If ((number = int.Parse(sLine)) > Int32.MaxValue)  
D. If (Int32.TryParse(sLine, out number))

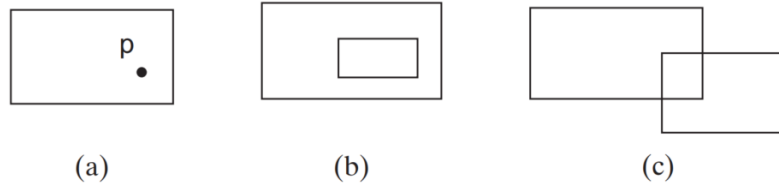
### 3. Programming (70 points)

(1) Create two sets of different random numbers with class Random, each having 10 numbers between 0 and 40. After reading all the values, display the values in the difference set of the given two sets. Given set A and set B the set difference of set B from set A is the set of all element in A, but not in B. For example, if A is [1, 2, 3, 5], B is [1, 2, 4, 6], the difference of A to B is [3, 5]. (10 points)

(2) Define the **MyRectangle2D** class that contains:

- 1) Two double properties named **X** and **Y** that specify the top left point of the rectangle with getter and setter accessors. (Assume the rectangle sides are parallel to x-or y-axis.)
- 2) The properties **Width** and **Height** with getter and setter accessors.
- 3) A no-arg constructor that creates a default rectangle with (0, 0) for the top left point and 1 for both Width and Height.
- 4) A constructor that creates a rectangle with the specified x, y, width, and height.
- 5) A read-only property **Area** that returns the area of the rectangle.
- 6) A read-only property **Perimeter** that returns the perimeter of the rectangle.
- 7) A method **Contains(double x, double y)** that returns true if the specified point (x, y) is inside this rectangle. (see figure a)
- 8) A method **Contains(MyRectangle2D r)** that returns true if the specified rectangle is inside this rectangle. (see figure b)
- 9) A method **Overlaps(MyRectangle2D r)** that returns true if the specified rectangle overlaps with this rectangle. (see figure c)
- 10) Write a test program that creates a MyRectangle2D object r1 (new MyRectangle2D (2, 2, 5.5, 4.9)), displays its area and perimeter, and displays the result of r1.contains(3,

3), `r1.contains(new MyRectangle2D(4, 5, 10.5, 3.2))`, and `r1.overlaps(new MyRectangle2D(3, 5, 2.3, 5.4))`.



(3) Write a program that reads words from a text file “book.txt” and displays the words whose length is larger than 10 (duplicates not allowed) in descending alphabetical order. The words must start with a letter.

(4) The skeleton of a program is listed as the following. Some of code is left out which is marked with [--x--]. Please fill in these codes as the comments required.

```
class Program {
 //create a delegate type
 public delegate int TwoIntegersOp(int n1, int n2);
 static void Main(string[] args) {
 //create two list of integers with different size and generate the elements
 List<int> numbers = new List<int>();
 List<int> numbers2 = new List<int>();
 //Add each element and 1, returns a new list, display it
 TwoIntegersOp op1 = (x, y) => x + y;
 List<int> res1 = Apply0d(numbers, 1, op1);
 res1.ForEach(x => Console.Write($"{x} "));
 //Multiply each elements and a value, return a new list, display it
 [-- a --]
 //Add each elements of two lists, return a new list, display it
 [-- b --]
 //Find the max value of two elements at same index, return a new list, display it
 [-- c --]
 }
 //Do the computation between each elements and an integer
 private static List<int> Apply0d(List<int> numbers, int value, TwoIntegersOp op) {
 [-- d --]
 }
 //Do the computation between each element pair with the same index.
 //If a list has more elements, the extra elements are kept the same.
 private static List<int> Apply1d(List<int> n1, List<int> n2, TwoIntegersOp op) {
 [-- e --]
 } }
}
```