Concept Questions:

1. What type would you choose for the following “numbers”?

A person’s telephone number string

A person’s height float

A person’s age int

A person’s gender (Male, Female, Prefer Not To Answer) string

A person’s salary- float

A book’s ISBN- string

A book’s price- float

A book’s shipping weight- decimal

A country’s population- int

The number of stars in the universe- long

The number of employees in each of the small or medium businesses in the

United Kingdom (up to about 50,000 employees per business)- int

2. What are the difference between value type and reference type variables?

Value type variables represent a value directly and are stored in the stack. They include simple types such as int, float, bool, and char. When you create a value type variable, the variable’s value is stored directly in the memory location assigned to the variable. Value types are passed by value meaning that. When you pass a value type variable to method, a copy of the variable is created and passed to the method

Reference types hold a reference an object hat is stored on the heap. When you create a reference type variable, a memory location is assigned to the variable to hold the reference to the object. When you pass a reference type variable to a method a copy of the reference is created and passed to the method. The multiple variables can reference the same object and changes make to the object through one variable are visible to all variables that reference the object

3. What happens when you divide an int variable by 0?

It will result in a runtime error of type “DivideByZeroException”. this is because dividing any number by 0 is undefined and mathematically invalid.

4. What happens when you divide a double variable by 0?

It will result in a special value called “infinity” or “Nan” not a number.

To more specific,

If dividend is positive, it will return positive infinity

If dividend is negative, it will return negative infinity

If both them are 0, it will return NaN

5. What happens when you overflow an int variable, that is, set it to a value beyond its

range?

The number will silently wrap around to the opposite end of the integer range. It called wraparound behavior. For example, if you add 1 to the maximum value of an int variable. It will return minimum value of an int variable

To avoid this situation, you can use checked code surround the code which might overflow, if there is a overflow , it will throw an OverFlowException.

6. What is the difference between x = y++; and x = ++y;?

For the first one (x = y ++). The value of y is assigned to x before the increment operator is applied to y. this means that x will receive the current value of y and y will incremented by 1 afterwards.

The second one. The increment operator is applied to y before the value of y is assigned to x. this means that x will receive the incremented value of y.

7. What is the difference between break, continue, and return when used inside a loop

statement?

When you use break in a loop, it will be terminated the loop immediately, the loop will not continue to execute any further iterations

When you use continue in a loop, continue statement skip the current iteration of the loop and proceeds with the next iteration.

When you use return statement, it will exited the method immediately and returns the specified value, it means your rest loop and any subsequent code in the method will not be executed

8. What are the three parts of a for statement and which of them are required?

First part is initialization, it used to initialize the loop variables and it executed only once before the loop start. This part is optional.

Second part is condition. It used to specify the condition that must be true so that your loop will continue executing. This part is required. If your condition is true, it will continue. While if it is false, it will terminate loop

The third part is iterator. It used to update the loop variables at the end of each iteration of the loop. This part is optional.