**01 Introduction to C# and Data Types**

**Understanding Data Types**

**Test your Knowledge**

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

A person’s telephone number : string

A person’s height: decimal

A person’s age:int, byte

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

A person’s salary: decimal, char

A book’s ISBN: string, varchar

A book’s price: decimal

A book’s shipping weight: decimal

A country’s population: int, byte

The number of stars in the universe: int, ulong

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, ushort

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

boxing and unboxing?

Value type will directly store value itself. reference type holds memory address.

Value type is stored in stack memory, reference type is stored in heap memory.

value type is not collected by garbage collector, reference type is collected by garbage collector.

boxing is converting value type to reference type.

unboxing is converting reference type to value type.

3. What is meant by the terms managed resource and unmanaged resource in .NET

Managed resources are those that are pure .Net code and managed by the runtime and are under its direct control.

Unmanaged resources are those that are not. File handles, pinned memory, database connections etc.

4. Whats the purpose of Garbage Collector in .NET?

Garbage Collector is for automatic memory managers to manage allocation and release memory once an object with no reference anymore, it will go to the garbage collector. It only works on heap memory. Reference type variable collected by garbage collector.

**Playing with Console App**

**Practice number sizes and ranges**

2.

using System;

public class Myclass{

static public void Main (){

Console.WriteLine("Enter number of centuries:");

long centuries = Convert.ToInt64(Console.ReadLine());

long years = centuries\*100 ;

long days = years\*365;

long hours = days \*24 ;

long minutes = hours \*60;

long seconds = minutes\*60;

long milliseconds = seconds\*1000 ;

long microseconds = milliseconds\*1000;

long nanoseconds = microseconds\*1000;

Console.Write(centuries+" centuries = ");

Console.Write(+years+" years = ");

Console.Write(days+" days = ");

Console.Write(hours+" hours = ");

Console.Write(minutes+" minutes = ");

Console.Write(seconds+" seconds = ");

Console.Write(milliseconds+" milliseconds = ");

Console.Write(microseconds+" microseconds = ");

Console.Write(nanoseconds+" nanoseconds ");

}

}

**Test your Knowledge**

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

returns negative infinity

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

returns positive infinity

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

range?

return will be low-order bits of the mathematical sum as represented in some sufficiently large two’s-complement format

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

x = y++ : value will be incremented after assigning value.

x = ++y : value will be incremented before assigning value

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

statement?

break results in the termination of the statement to which it applies (switch, for, do, or while) and is used to exit the loop.

continue statement is used to end the current loop iteration and return control to the loop statement.

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

the initialization(loop variant), the condition, and the advancement to the next iteration.

7. What is the difference between the = and == operators?

= compares data value

== compares both data value and data type

8. Does the following statement compile? for ( ; true; ) ;

yes

9. What does the underscore \_ represent in a switch expression?

The underscore character replaces the default keyword to signify that it should match anything if reached. The bodies are now expressions instead of statements. The selected body becomes the switch expression’s result.

10. What interface must an object implement to be enumerated over by using the foreach

statement?

The IEnumerable interface permits enumeration by using a foreach loop.

**Practice loops and operator**

2. for(int row = 0; row <10; row++){

for(int column = 0; column <row+1; column++}

{console.Write(“\*”);}

console.Writeline();}

3.private static int GetGuess()

{

int guess = 0;

try

{

guess = Convert.ToInt32(Console.ReadLine());

}

catch (Exception)

{

Console.WriteLine("You did not enter a valid guess.");

guess = GetGuess();

}

return guess;

}

5. using System;

//Implementation of Displaying Greeting according to time

//Driver Code

class HelloWorld

{

//main method

static void Main()

{

//variables to hold the current hours in 24 hour format

DateTime dt1 = DateTime.Now;

int hours = Convert.ToInt16(dt1.ToString("HH"));

//check the hour between 0 and 23

if(hours >= 0 && hours <= 11)

{

Console.WriteLine("Good Morning.");

}

if(hours>=12 && hours <=16)

{

Console.WriteLine("Good AfterNoon.");

}

if(hours>=17 && hours <=20)

{

Console.WriteLine("Good Evening.");

}

if(hours > 20)

{

Console.WriteLine("Good Night.");

}

}