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**BSIT 32E2 Prof. Nino Alamo**

**Sample Assessment for Introduction to Programming**

This assessment is designed to evaluate your understanding of basic programming concepts in C#, HTML, CSS, and JavaScript.

Instructions: Read each question carefully and provide complete and clear answers. Avoid multiple-choice format responses. Focus on demonstrating your understanding through code, explanations, and discussions.

**Part 1: C# (30 points)**

**(10 points) Write a C# program that calculates the area of a triangle given its base and height. Include user input for both values and display the calculated area.**

**Source Code:  
A computer screen shot of a program

Description automatically generated**

**Output:**

A black background with white text

Description automatically generated

**Explanation:**

In this program, we need to find the area of the triangle based on the value inputted to the base of the triangle and the height of the triangle. I used double for possible decimal points. Then a variable stands for Area, b variable stands for base and h variable stands for height. The formula is a = 0.5 x b x h. Then the Console.WriteLine($”The area of the triangle is: {a}”); is for displaying the answer of this program.

**(10 points) Declare an array of 5 integers and fill it with values based on a user-defined formula (e.g., n^2). Then, print the largest element in the array.**

**Source Code:**

**A screen shot of a computer program

Description automatically generatedA computer screen shot of a program code

Description automatically generated**

**A screen shot of a computer program

Description automatically generated**

**Output:**

A black screen with white text

Description automatically generated

A black screen with white text

Description automatically generated

**Explanation:**

In this program, I used 5 formulas that can be displayed. After entering a formula, the first 5 array elements are displayed then the program will display the largest element in the array. I also used default for possible unsupported formula entered, this will stand as my else statement.

**(10 points) Implement a simple for loop that iterates from 1 to 10 and prints each number along with its square root.**

**Source Code:**

**A computer screen shot of a program code

Description automatically generated**

**Output:**

**A black screen with white text

Description automatically generated**

**Explanation:**

In this program, it displays numbers 1 up to 10 along with its square root. I used double for possible decimal points. Then I used a for loop for iteration then this program used incrementation to display 1 until 10 with its square root.

**Part 2: HTML, CSS, and JavaScript (30 points)**

**HTML (10 points):** You are provided with the following incomplete HTML code snippet:

**HTML**

**<!DOCTYPE html>**

**<html>**

**<head>**

**<title>My Website</title>**

**</head>**

**<body>**

**<h1>Welcome to...</h1>**

**<p>This is a paragraph...</p>**

**<ul>**

**<li>Item 1</li>**

**<li>Item 2</li>**

**</ul>**

**</body>**

**</html>**

Complete the code snippet by adding the following elements:

An image within the <body> tag with a relevant src attribute.

An ordered list (<ol>) with three items.

A hyperlink within a <p> tag that points to an external website.

A CSS styling rule using an inline style attribute to change the font color of the <h3> heading.

CSS (10 points): Create a CSS stylesheet that defines the following styles:

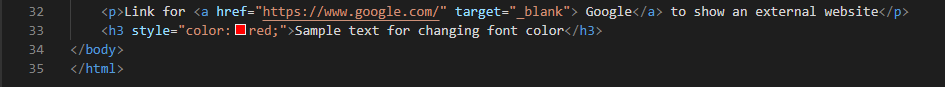
Change the background color of the body element to light blue.

Apply a padding of 20px to all headings (h1, h2, h3).

Set the font size of the <p> tag to 14px.

Make the list items (li) have a bullet point style instead of the default numbers.

**Code:**

A screen shot of a computer

Description automatically generated

**Output:**

A screenshot of a computer

Description automatically generated

**Explanation:**

In this HTML file, I completed the snippet HTML code based on the instructions above. I added an icon/image inside the body tag. Then I change the background color using internal css style as well as the changes for the paragraph, adding padding, font size, list of items, and changing list of items to bullet/circle. I also did the external website using hyperlink. And lastly changing font color using inline css style/

**JavaScript (10 points):** Write a JavaScript function that takes a number as input and returns a string indicating whether the number is even or odd. Then, add a button to your HTML page that, when clicked, calls this function and displays the result (even or odd) in a paragraph element below the button.

**Code:**

A screen shot of a computer program

Description automatically generated

**Output:**

**A screenshot of a computer error

Description automatically generated**

A screenshot of a computer error message

Description automatically generated

**Explanation:**

In this JavaScript code, we need to modify if the number is an Even Number or an Odd Number. We used a function EvenorOdd to specify if the input number is Even or else an Odd Number. Then next is we used function Result for the button function, where the input number will be analyzed as we click the check button, if it is an Odd or an Even number then the result will be displayed. “This number is (the result if the number is even or odd) number.”

**Part 3: Essay Question (40 points)**

Discuss the importance of object-oriented programming (OOP) concepts in software development. Explain the key principles of OOP (encapsulation, inheritance, polymorphism, abstraction) and provide examples of how they can be used to create more efficient, maintainable, and reusable code. Include real-world scenarios or cases where OOP is particularly valuable.

**Object-oriented programming (OOP)** stands as a fundamental paradigm in modern software development, using objects and classes to structure and design software efficiently while enhancing its maintainability and reusability.

**Encapsulation** consolidates data and methods within a class, safeguarding data integrity and allowing controlled access, thereby empowering the class to manage its state and actions autonomously.

**Inheritance** facilitates code reuse by enabling a class to inherit properties and methods from a superclass, fostering the creation of a hierarchical class structure and promoting efficient development practices.

**Polymorphism** promotes code flexibility by allowing objects from diverse classes to be treated uniformly as objects of a common superclass, fostering generic programming and simplifying code maintenance.

**Abstraction** conceals intricate implementation details, exposing only pertinent object features, streamlining the programming process, and facilitating the management of complex systems.

In real-world applications, OOP proves indispensable in large-scale software projects where the effective handling of complexity, code reuse, and maintainability are paramount.

For instance:

* Software development frameworks such as Java Spring, .NET Framework, and Ruby on Rails capitalize on OOP principles, streamlining application development through the reuse of existing code and libraries.
* GUI applications benefit from OOP by representing each graphical element as an object with tailored properties and behavior, facilitating the design and upkeep of intricate user interfaces.
* In game development, OOP aids in modeling various game entities, like players, enemies, and items, each endowed with unique attributes and behaviors, thereby simplifying the management of game logic and interactions.