**CSC 440/540 Introduction to Computer Algorithms**

**Fall 2023**

**Final Examination (Take-home)**

**Release Time:** Nov 21 6:00 PM

**Due Time:** Nov 30 11:59 PM

**Total points**: 150

**NAME** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STUDENT ID#** \_\_\_\_\_\_\_\_\_\_\_

1. (50 points) **Short answer questions** (2 points for each question).

**Part I: Web Programming Fundamentals**

1. Describe the relative advantages and disadvantages of web-based applications in comparison to traditional desktop applications.
2. What is the Internet Protocol (IP)? Why is it important for web developers?

**Part II: HTML**

1. What role do HTML validators play in web development?
2. Describe the difference between a relative and an absolute reference. When should each be used?
3. What is the difference between HTTP GET and POST? What are the advantages and disadvantages of each?
4. What are the most common types of user input validation?

**Part III: CSS**

1. What are the main benefits of using CSS?
2. What are the different parts of a CSS style rule?
3. What is the difference between a relative and an absolute measure unit in CSS? Why are relative units preferred over absolute units in CSS?
4. What are class selectors? What are id selectors? Briefly discuss why you would use one over the other.
5. Illustrate the CSS box model. Be sure to label each of the components of the box.
6. What is opacity? Provide examples of three different ways to set it in CSS.
7. Describe the differences between relative and absolute positioning.
8. Describe how block-level elements are different from inline elements.
9. In CSS, what does floating an element do? How do you float an element?

**Part IV: JavaScript**

1. What kind of variable typing is used in JavaScript? What benefits and dangers arise from this?
2. How are function declarations different from function expressions? Why are function expressions often the preferred programming approach in JavaScript?
3. What is callback function?
4. Identify and define three types of scope within JavaScript. Provide a short example that demonstrates these scope types.
5. What are some key DOM objects?
6. What are the five key DOM selection methods? Provide an example of each one.
7. Why is the event listener approach to event handling preferred over the other two approaches?

**Part V: React**

1. What is a single-page application? Why are frameworks helpful in their creation?
2. What is JSX? What benefits does it have for web developers?
3. How are functional components different from class components?
4. (25 points). **HTML** (5 points for each question).

**\*\*\* START PROJECT: please find it in the HTML folder in this Final Exam package. \*\*\***

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**A close-up of a page

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**\*\*\* START PROJECT: please find it in the HTML folder in this Final Exam package. \*\*\***

1. (40 points). **CSS** (5 points for each question).

**\*\*\* START PROJECT: please find it in the CSS folder in this Final Exam package. \*\*\***

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**\*\*\* START PROJECT: please find it in the CSS folder in this Final Exam package. \*\*\***

1. (35 points). **JavaScript** (5 points for each question).

**\*\* START PROJECT: please find it in the JavaScript folder in this Final Exam package.\*\***

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A page of a computer program

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**\*\* START PROJECT: please find it in the JavaScript folder in this Final Exam package.\*\***

* **END**