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MULTIPLE CHOICE (50 points)

Code example 1.1

```
$(document).ready(function() {  
    var createClickCounter = function() {  
        var count = 0;  
  
        var clickCounter = function() {  
            count++;  
            console.log(this.id + " + count is " + count);  
        };  
        return clickCounter;  
    };  
  
    $("#btnCount").click( createClickCounter() );  
});
```

1. (Refer to code example 1.1) Which of the following statements about this code is NOT true?

a.	It creates a closure by returning an inner function that has access to the outer function's count variable.
b.	The count variable stays alive after the outer function runs and can be accessed outside code. ✓
c.	The count variable stays alive after the outer function runs and can be accessed by inner function only.
d.	The inner function is attached as the event handler for the button's click event.

2. (Refer to code example 1.1) Why is there a pair of parentheses after createClickCounter in the statement that attaches the handler for the click event of the button?

a.	Because it's an immediately invoked function expression.
b.	Because this is the standard notation for closures.
c.	So the outer function runs and returns the definition of the inner function as event handler. ✓
d.	So the outer and inner functions are executed.

3. (Refer to code example 1.1) The count variable of the outer function is

a. a property	c. in global state
b. the scope chain	d. <b>in private state ✓</b>

4. One way to make the *this* keyword of an outer function available to an inner function is to use a method of the inner function. Which one is it?

a. call()	c. <b>bind() ✓</b>
b. apply()	d. toString()

5. One way to make the *this* keyword of an outer function available to an inner function is to store the value of the outer function's *this* keyword in a

a. <b>private variable ✓</b>	c. method
b. property	d. object

### Code example 1.2

```
myapp.slideshow = (function() {  
    var timer, play = true;  
    var nodes = { image: null, caption: null };  
    var img = { cache: [], counter: 0 };  
    var stopSlideShow = function() { ... }  
    var displayNextImage = function(){ ... }  
    var setPlayText = function(btn) { ... }  
    return {  
        speed: 2000;  
        loadImages: function(slides) { ... },  
        startSlideShow: function(){ ... },  
        createToggleHandler: function(){ ... }  
    };  
})();
```

6. (Refer to code example 1.2) Which of the following statements about this code is true?

a. <b>It uses the module pattern to create a slideshow object with three public methods. ✓</b>
b. It can create multiple instances of the slideshow object.
c. Its speed property is part of its private state.
d. It adds several variables and functions to the global namespace.

7. (Refer to code example 1.2) Which of the groups that follow only contains private variables and functions?

a.	timer, setPlayText, and loadImages.
b.	timer, play, stopSlideShow, and displayNextImage.
<b>c.</b>	<b>nodes, stopSlideShow, and startSlideShow. ✓</b>
d.	nodes, img, and createToggleHandler.

8. To interact with a web server, the client for a web application uses programs called

<b>a.</b>	<b>web browsers ✓</b>	c.	local area networks
b.	Internet service providers	d.	JavaScript engines

9. To make a website available to other computers over a network, the website is stored on

a.	an application server	<b>c.</b>	<b>a web server ✓</b>
b.	a database server	d.	the Internet

10. An HTTP response is sent from

a.	the web server to the application server
b.	the application server to the web server
c.	the client to the web server
<b>d.</b>	<b>the web server to the client ✓</b>

11. When a client requests a static web page, the HTML is

<b>a.</b>	<b>accessed from the web server ✓</b>
b.	generated by an application server
c.	accessed from a database server
d.	generated by the web browser

12. When a client requests a dynamic web page, the HTML is generated by

a.	the web server
<b>b.</b>	<b>an application server ✓</b>
c.	the JavaScript engine
d.	the web browser

13. Which HTML element can be used to group elements when none of the semantic elements apply?

a.	section	c.	main
<b>b.</b>	<b>div ✓</b>	d.	aside

14. Which of the following is a valid selector for a class named menu?

a.	<b>menu</b>
b.	<b>#menu</b>
c.	<b>.menu</b> ✓
d.	<b>&gt; menu</b>

15. Within a CSS style rule, a property declaration includes

a.	a selector and a declaration block
b.	a selector and a value
c.	a property and a selector
d.	<b>a property and a value</b> ✓

16. What elements would the style rule that follows apply to?

**.red { color: red; }**

a.	The only element with an id of red
b.	All elements with an id of red
c.	The only element with a class named red
d.	<b>All elements with the class named red</b> ✓

17. Which type of selector would you use to refer to a specific HTML element?

a.	a type selector	c.	a class selector
b.	<b>an id selector</b> ✓	d.	a span selector

18. If you're using the Chrome browser and a JavaScript application stops running due to an error in the JavaScript code, you can identify the statement that caused the error by first pressing F12. Then, you can

a.	click on the link in the Sources panel and review the code in the Console panel
b.	click on the link in the Sources panel and review the code in the Application panel
c.	<b>review the code in the Console panel</b> ✓
d.	review the code in the Sources panel

19. To make sure that the HTML and CSS for a web page are interpreted the same way by all browsers, you can use

a.	a JavaScript shiv
b.	<b>the normalize.css style sheet</b> ✓
c.	both A and B
d.	neither A nor B

20. To start and stop a slide show, you must do all but one of the following. Which one is it?

a.	<b>Code a function expression for running the slide show ✓</b>
b.	Code an event handler for the click event of the slides
c.	Call the setInterval() method to start the slide show
d.	Call the clearInterval() method to stop the slide show

21. What does the following code do?

```
var userName = $("user").firstChild.nodeValue;
```

a.	It sets the text of an HTML element with “user” as its id attribute.
b.	<b>It puts the text of an HTML element with “user” as its id attribute into userName variable. ✓</b>
c.	It replaces the text of an HTML element with “userName” as its id attribute with value “user”.
d.	It puts the value of the userName variable into the HTML element with “user” as its attribute.

22. Which of the following statements about radio buttons is NOT true?

a.	<b>A user can select more than one radio button in a group. ✓</b>
b.	Each radio button in a group must have the same name attribute.
c.	Each radio button in a group must have a unique id attribute.
d.	All of the above.

23. Given HTML that includes the element

```
<p id = "ship">shipping cost goes here</p>
```

what will the following code do if the user enters 100 at the prompt?

```
var getInfo = function() {  
    var cost = parseFloat(prompt("How much does the item cost?"));  
    var ship = cost * .06;  
    document.getElementById("ship").innerHTML="Shipping:  $"  +  
    ship.toFixed(2);  
};
```

a.	It will display “shipping cost goes here Shipping: \$6.00” in the element.
b.	<b>It will replace the text in the &lt;p&gt; element with “Shipping: \$6.00”. ✓</b>
c.	It will display NaN in the <p> element because the starting text in this element is not a number.
d.	It will calculate the value of the ship variable, but the <p> element will remain unchanged.

24. What does the following line of code do?

```
$("user").innerHTML = "Hello, good friend!";
```

a.	It sets the content of the element with “user” as its id attribute to “Hello, good friend!” ✓
b.	It sets the value property of the element with “user” as its id attribute to “Hello, good friend!”
c.	It gets the content of the element with “user” as its id attribute and appends “Hello, good friend!” to that content.
d.	It gets the value property of the element with “user” as its id attribute and appends “Hello, good friend!” to that property.

25. When does the ready() event handler run?

a.	As soon as the browser starts.
b.	As soon as the JavaScript load event is done.
c.	As soon as all the page elements are loaded in the browser.
d.	As soon as the Document Object Model is built. ✓

26. Which of the following methods would you use to execute a method for each element in an array?

a.	html()	c.	every()
b.	hide()	d.	each() ✓

27. Which of the following events occurs when the user moves the mouse pointer over an element and then clicks on it?

a.	click	c.	hover
b.	mouseover	d.	all of the above ✓

28. Which of the following statements is true?

a.	All browsers provide automatic data validation for all HTML5 input controls.
b.	All browsers provide automatic data validation for some HTML5 input controls.
c.	Some browsers provide automatic data validation for some HTML5 input controls. ✓
d.	Some browsers provide automatic data validation for all HTML5 input controls.

29. Which of the following HTML5 attributes is used for data validation?

a.	Pattern ✓	c.	action
b.	autofocus	d.	placeholder

### Code example 1.3

```
$(document).ready(function() {
    $("#contact_me").change(
        function() {
            if ($("#contact_me").attr("checked")) {
                $(":radio").attr("disabled", false);
            } else {
                $(":radio").attr("disabled", true);
            }
        }
    );
});
```

30. (Refer to code example 1.3) What does this code do?

a.	It disables or enables a specific radio button when an element is checked or unchecked.
<b>b.</b>	<b>It disables or enables all radio buttons when an element is checked or unchecked. ✓</b>
c.	It disables or enables a specific check box when an element is checked or unchecked.
d.	It disables or enables all check boxes when an element is checked or unchecked.

31. (Refer to code example 1.3) What do the jQuery selectors in this code select?

a.	individual elements by id only
b.	disabled radio buttons only
c.	an individual element by id and disabled radio buttons
<b>d.</b>	<b>an individual element by id and all radio buttons ✓</b>

32. The Internet consists

a.	of one wide area network
<b>b.</b>	<b>of many wide area networks that are connected to local area networks ✓</b>
c.	of thousands of local area networks that are connected by routers
d.	of one wide area network that is connected to thousands of local area networks

33. To deploy a website, you use

a.	HTML	c.	FTP
b.	CSS	<b>d.</b>	<b>HTTP ✓</b>

34. You can use a link element in an HTML document to provide

a.	an embedded style sheet	c.	either A or B
<b>b.</b>	<b>an external style sheet ✓</b>	d.	neither A nor B

35. Which of the following is NOT a guideline for user accessibility?

a.	Provide text that is easy to read.
b.	Make sure all links can be accessed with the keyboard.
c.	Make sure that any essential information in images is also provided in text.
d.	<b>Make sure that each page will run in all browsers. ✓</b>

36. Which of the following will test whether a Boolean variable named isValid is true?

a.	<b>isValid == true</b>	c.	<b>!isValid == false</b>
b.	<b>isValid</b>	d.	<b>all of the above ✓</b>

37. What is the correct use of the margin property on an image to center it in its containing block?

- a) margin: 0% 50% 0% 50%;
- b) margin: 0px auto; ✓**
- c) margin: 0px;

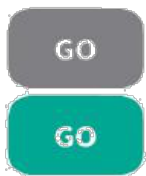
38. In CSS3, you can supply multiple background images using the following syntax. Which of these background images would be shown in front/on the top? **a) background-a.png ✓**

```
body {  
    background:  
    url("background-a.png"),  
    url("background-b.png"),  
    url("background-c.png");  
}
```

- a) background-a.png
- b) background-b.png
- c) background-c.png

**a) background-a.png ✓**

39. Here you can see an image sprite. The image at the top is used for the default state, and the image underneath is used when the user hovers over the button. Which of the following would be used to move the image sprite up on hover? **b) a#go:hover {background-position: 0px -23px;} ✓**



- a) `a#go:hover {background-position: 0px 0px;}`
- b) `a#go:hover {background-position: 0px -23px;}` ✓**
- c) `a#go:hover {background-position: -23px 0px;}`

**b) a#go:hover {background-position: 0px -23px;} ✓**



40. If you wanted to have a sidebar running down the page, which element would you use?

- a) **<aside>** ✓
- b) <sidebar>
- c) <sidecolumn>

41. In order for CSS to work with HTML5 elements, you need to use a JavaScript HTML5 shiv or shim. What is this placed in?

- a) `<!--[if IE 9]><script type="text/javascript" src="js/html5-shiv.js"></script><![endif]-->`
- b) `<!--[if <=IE8 ]><script type="text/javascript" src="js/html5-shiv.js"></script><![endif]-->`
- c) `<!--[if lt IE 9]><script type="text/javascript" src="js/html5-shiv.js"></script><![endif]-->`

**c) <!--[if lt IE 9]><script type="text/javascript" src="js/html5-shiv.js"></script><![endif]-->** ✓

42. What is the correct markup to make a table cell extend the width of two columns?

- a) <td span-"2">
- b) **<td colspan-"2">** ✓
- c) <td rowspan-"2">

43. Which of these is not a valid way to specify a color?

- a) `b{color:50,60,70;}`
- b) `b{color:rgb(50,60,70);}`
- c) `b{color:#323c46;}`

**a) b{color:50,60,70;}** ✓

44. Which is the correct way to specify the color of a paragraph of text?

- a) `p{color:#ff0000;}`
- b) `p{text-color:#ff0000;}`
- c) `p{font-color:#ff0000;}`

**a) p{color:#ff0000;}** ✓

45. RGB colors contain values between 0 and 255. What is the value of blue in this color: rgb(102,205,170)?

- a) 102
- b) 205
- c) 170

**c) 170** ✓

46. In the code that follows, document is a/an

```
document.getElementById("emailAddress");
```

a.	window	c.	Textbox
b.	<b>Object ✓</b>	d.	String

47. After the code that follows is executed, the variable named userEntry will contain

```
var userEntry = 461.95;  
userEntry = parseInt(userEntry);
```

a.	<b>461.95</b>	c.	<b>461 ✓</b>
b.	<b>462</b>	d.	cannot tell

48. Because window is the global object of JavaScript,

a.	it is not necessary to code the object name before the method name
b.	<b>it is the highest object of the DOM structure ✓</b>
c.	it is not necessary to convert numbers returned by the prompt() method using parseInt or parseFloat()
d.	you cannot use the confirm() method with the window object

49. When the statement that follows is executed, JavaScript

```
var rate = parseFloat(document.getElementById("rate").value);
```

a.	executes the getElementById() method, executes the value method of the result object, and executes the parseFloat() method on that value
b.	<b>executes the getElementById() method, gets the value property of the result object, and executes the parseFloat() method on that value ✓</b>
c.	executes the parseFloat() method, executes the getElementById() method, and executes the value method of the resulting object
d.	executes the parseFloat() method, executes the getElementById() method, and gets value property of the resulting object

50. Which of the following is NOT a relational operator?

a.	>	c.	<b>!=</b>
b.	>=	d.	<b>= ✓</b>

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## Question 2 (10 points):

```
$(document).ready(function() {
    $("#member_form").submit(
        function(event) {
            var isValid = true;
            .
            .
            var password = $("#password").val().trim();
            if (password == "") {
                $("#password").next().text("This field is required.");
                isValid = false;
            } else if ( password.length < 6) {
                $("#password").next().text("Must be 6 or more
characters.");
                isValid = false;
            } else {
                $("#password").next().text("");
            }
            $("#password").val(password);
            .
            .
            if (isValid == false) { event.preventDefault(); }
        }
    );
});
```

2.1. (Refer to code above) What does the preventDefault() method in this code do?

*- The preventDefault() method prevents the default action of an element from running. In the given code, the default action is the submit() function. So, the preventDefault() cancels the submit () event method of the form, if the validation fails.*

2.2. (Refer to code above) Why is the following line of code necessary after the if-else statement?

```
$("#password").val(password);
```

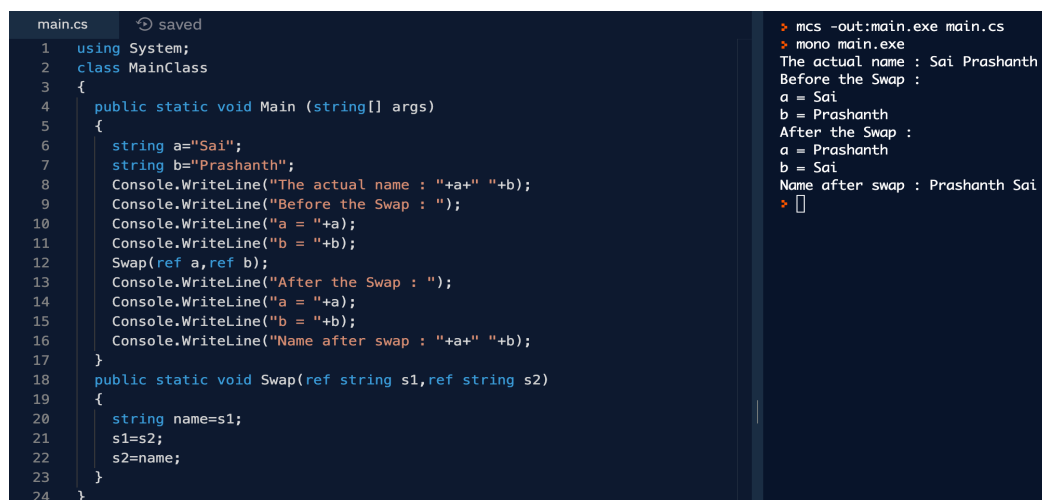
*- The form checks whether the entered password is null or if it's less than 6 characters. This given line of code, re-assigns the trimmed password after validation. That's why it's necessary.*

## Question 3 (10 points)

a. In C#, write a public static method called **Swap** that takes two strings as input by reference and exchanges their values.

```
using System;
class MainClass
{
    public static void Main (string[] args)
    {
        string a="Sai";
        string b="Prashanth";
        Console.WriteLine("The actual name : "+a+" "+b);
        Console.WriteLine("Before the Swap : ");
        Console.WriteLine("a = "+a);
        Console.WriteLine("b = "+b);
        Swap(ref a,ref b);
        Console.WriteLine("After the Swap : ");
        Console.WriteLine("a = "+a);
        Console.WriteLine("b = "+b);
        Console.WriteLine("Name after swap : "+a+" "+b);
    }
    public static void Swap(ref string s1,ref string s2)
    {
        string name=s1;
        s1=s2;
        s2=name;
    }
}
```

b. Give a sample invocation of your Swap method :



The screenshot shows a C# code editor with a file named 'main.cs'. The code implements the 'Swap' method as described in the previous block. The output of the program is displayed on the right side of the editor, showing the sequence of console outputs: 'The actual name : Sai Prashanth', 'Before the Swap :', 'a = Sai', 'b = Prashanth', 'After the Swap :', 'a = Prashanth', 'b = Sai', and 'Name after swap : Prashanth Sai'.

```
main.cs  saved
1 using System;
2 class MainClass
3 {
4     public static void Main (string[] args)
5     {
6         string a="Sai";
7         string b="Prashanth";
8         Console.WriteLine("The actual name : "+a+" "+b);
9         Console.WriteLine("Before the Swap : ");
10        Console.WriteLine("a = "+a);
11        Console.WriteLine("b = "+b);
12        Swap(ref a,ref b);
13        Console.WriteLine("After the Swap : ");
14        Console.WriteLine("a = "+a);
15        Console.WriteLine("b = "+b);
16        Console.WriteLine("Name after swap : "+a+" "+b);
17    }
18    public static void Swap(ref string s1,ref string s2)
19    {
20        string name=s1;
21        s1=s2;
22        s2=name;
23    }
24 }
```

Output:

```
> mcs -out:main.exe main.cs
> mono main.exe
The actual name : Sai Prashanth
Before the Swap :
a = Sai
b = Prashanth
After the Swap :
a = Prashanth
b = Sai
Name after swap : Prashanth Sai
> 
```

## Question 4 (30 points)

Develop a C# program that will determine whether a department-store customer has exceeded the credit limit on a charge account. For each customer, the following facts are available:

- a. a. Account number (an integer)
- b. b. Balance at the beginning of the month
- c. c. Total of all items charged by this customer this month
- d. d. Total of all credits applied to this customer's account this month
- e. e. Allowed credit limit

The program should use a while statement to input each of these facts, calculate the new balance (= beginning balance + charges – credits) and determine whether the new balance exceeds the customer's credit limit. For those customers whose credit limit is exceeded, the program should display the customer's account number, credit limit, new balance and the message "Credit Limit Exceeded."

```
Enter account number (or -1 to quit): 100
Enter beginning balance: 5394.78
Enter total charges: 1000.00
Enter total credits: 500.00
Enter credit limit: 5500.00
New balance is 5894.78
Account: 100
Credit limit: 5500.00
Balance: 5894.78
Credit Limit Exceeded.
```

```
Enter Account Number (or -1 to quit): 200
Enter beginning balance: 1000.00
Enter total charges: 123.45
Enter total credits: 321.00
Enter credit limit: 1500.00
New balance is 802.45
```

```
Enter Account Number (or -1 to quit): -1
```

**Solution in next page :**

```

using static System.Console;
using System;
namespace IT583_question_4
{
    class Program
    {
        static void Main(string[] args)
        {
            int accountNumber=0;
            double balance;
            double totalCharge;
            double totalCredits;
            double creditLimit;
            do
            {
                try
                {
                    Write("Enter account number (or -1 to quit): ");
                    accountNumber = int.Parse(ReadLine());
                    if (accountNumber != -1)
                    {
                        Write("Enter begining balance: ");
                        balance = double.Parse(ReadLine());
                        Write("Enter total charges: ");
                        totalCharge = double.Parse(ReadLine());
                        Write("Enter total credits: ");
                        totalCredits = double.Parse(ReadLine());
                        Write("Enter credit limit: ");
                        creditLimit = double.Parse(ReadLine());
                        balance = balance + totalCharge - totalCredits;
                        if (balance > creditLimit)
                        {
                            Write("New balance is {0:0.00}\nAccount: {1}\nCred  

                                limit: {2:0.00}\n" + "Balance: {3:0.00}\nCred  

                                Exceeded\n\n", balance, accountNumber, creditLimit,  

                                balance);
                        }
                        else
                        {
                            Write("New balance is {0:0.00}\n\n", balance);
                        }
                    }
                }
                catch (FormatException ex)
                {
                    WriteLine(ex.Message);
                }
            } while (accountNumber != -1);
        }
    }
}

```

## Execution of the code for Q 4 :

```
main.cs saved
1 using static System.Console;
2 using System;
3 namespace IT583_question_4
4 {
5     class Program
6     {
7         static void Main(string[] args)
8         {
9             int accountNumber=0;
10            double balance;
11            double totalCharge;
12            double totalCredits;
13            double creditLimit;
14            do
15            {
16                try
17                {
18                    Write("Enter account number (or -1 to quit): ");
19                    accountNumber = int.Parse(ReadLine());
20                    if (accountNumber != -1)
21                    {
22                        Write("Enter begining balance: ");
23                        balance = double.Parse(ReadLine());
24                        Write("Enter total charges: ");
25                        totalCharge = double.Parse(ReadLine());
26                        Write("Enter total credits: ");
27                        totalCredits = double.Parse(ReadLine());
28                        Write("Enter credit limit: ");
29                        creditLimit = double.Parse(ReadLine());
30                        balance = balance + totalCharge - totalCredits;
31                        if (balance > creditLimit)
32                        {
33                            Write("New balance is {0:0.00}\nAccount: {1}\nCredit limit: {2:0.00}\n" + "Balance:
34                                {3:0.00}\nCredit Limit Exceeded\n\n", balance, accountNumber, creditLimit, balance);
35                        }
36                        else
37                        {
38                            Write("New balance is {0:0.00}\n\n", balance);
39                        }
40                    }
41                } catch (FormatException ex)
42                {
43                    WriteLine(ex.Message);
44                }
45            } while (accountNumber != -1);
46        }
47    }
48 }
```

```
> mcs -out:main.exe main.cs
> mono main.exe
Enter account number (or -1 to quit): 100
Enter begining balance: 5394.78
Enter total charges: 1000
Enter total credits: 500
Enter credit limit: 5500
New balance is 5894.78
Account: 100
Credit limit: 5500.00
Balance: 5894.78
Credit Limit Exceeded

Enter account number (or -1 to quit): 200
Enter begining balance: 1000
Enter total charges: 123.45
Enter total credits: 321
Enter credit limit: 1500
New balance is 802.45

Enter account number (or -1 to quit): -1
> 
```

**For Graduate Students Only (both questions are required):**

1. Explain how you see the content from this course fitting into your future work once you've completed your Masters degree. What areas do you see as "good fits" and what areas do you see as "not likely to be of use to me beyond this class."

*- I'm working towards a career as a Full stack developer or a Front-end developer.*

*- So, the content of this course is a perfect fit to my future work in that regard.*

*- The slides were very useful & the exercises helped me implement the learning in a practical way.*

*- The good fits are obviously : html, css, javascript, jquery, web servers, interactive pages, web services etc.*

*- The areas I'd not likely use beyond this class would be C# & ASP.NET as I'm not too keen on those.*

*- Overall, I feel I've made the right choice in taking up this class & I've learnt a lot during the process.*



2. Document the time spent on each of the assignments/capstones/exams in this course (you can choose to also cover the labs). For each, document the time spent into each of the phases of the SDLC. Where and how could you have improved your use of time?

[ NOTE: In S.D.L.C, I'm excluding the deployment & maintenance phases because I think they are not relevant for this course. Deployment is submission & maintenance is not there for assignments, exams except for the project. Also, the time mentioned is approximate as far as I can remember. ]

- *For each assignment : 5 hours ( 12 assignments = 60 hours )*

- Analysis – 1 hour
- Design – 1 hour
- Coding – 2 hours
- Testing – 1 hour

- *For mid-term exam : 6 hours*

- Analysis – 1 hour
- Design – 1 hour
- Coding – 3 hour
- Testing – 1 hour

- *For final exam : 15 hours*

- Analysis – 1 hour ( including analysis for - Q 3 & Q 4 )
- Design – 0 ( as it's multiple choice & written exam )
- Coding – 3 hours ( for Q 3 & Q 4 )
- Testing – 1 hour ( for Q 3 & Q 4 )
- Approx 10 hours over 2 days for answering all the questions.

- *For the project : (1-2) hours per day for 3 months.*

We are group of '2' people. Me & komal. We did the project over a period of time. For the first presentation on Feb 26<sup>th</sup>, we spent around 1 hour a day for that month. From then till now, we've been working approx 2 hours a day making changes or coding or designing or adding features etc.

- *So, everything combined I've spent around 180-200 hours approx*

- I feel I made good use of time, but could be better in exams & project. I should learn to implement the concepts a bit better so I can manage the time better in exams. For project, due to the corona situation, we couldn't interact much and that delayed our process & increased the time. I will improve further.

- END -