IS683 Final Exam

Answer the following questions in 1-2 paragraphs. Each one is worth 5 points.

1. **What is a software design pattern? Why are they important? How would you use them in the future?**

=>Software design pattern is a reusable software solution to a problem that occurs frequently when developing programs.

=> A design pattern is not a finished design that can be transformed to a source code but it is a description of how to solve a problem that can be used in different situations.

=> They generally show the relationships between classes and the objects.

They are important because they are proven to software development problems. Also patterns are reusable for similar problems.

=>They can be used in future if a company want to enhanced it application with more features, then they can use the software design pattern.

1. **What is unit testing? Why is it important? How would you use it?**

=>Unit testing means testing the smallest unit of the source code whether its working perfectly or not.

=>It is important because it allows you to execute your code right away and know how it works. It also gives you an idea how your application will look in different scenarios.

=>Tests are written as the code. The idea is every time you make a change to a unit ,you rerun the test and see whether your change has broken anything. You can then fix it before anyone else finds out.

1. **What is GIT and how is it used to manage software projects?**

* It is distributed version control system. Every time we commit or save the file in git, it takes a picture of how your files look like at that moment and stores a reference.
* Companies generally use Git Hub to keep track of the work done by their employees regularly.
* Every day what an employee does his work and when he commits the work, it can be seen by the authorized person. This way the manager can keep track of work done by their employees.

1. **Describe and diagram the CSS box model.**

* The Box Model is the one which wraps around the HTML elements and it consists of margin, borders, padding and the actual content.
* Margin: It clears an area around the border and it doesn’t consist of background color .
* Border: It is one which goes around the padding and the content.
* Padding : Clears an area around the content.
* Content: The content where text and image appears.

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | |  | | --- | | Content |   Padding |   Border |   Margin |

1. **Describe the relationship between HTML, CSS, and JavaScript.**

**=> HTML** is used for structuring content. It marks the content up into different structure types.

**=> Cascading Style Sheet(CSS**) allows you to specify things like what would be the font size, whether the page would have 2 columns and so on. Basically it is responsible for the appearance of the webpage. It tells the browser how each element should be displayed.

**=> Javascript:** It is used for interactive functionality. It tells the browser how to change the web page in response to the events that happen. For instance validation of a form and so on.

The web page we see in our browser is a combination of HTML,CSS and Javascript.

1. **Describe the purpose of the Singleton design pattern.**

* It is a creational design pattern which is used to create the objects.
* Singleton pattern is used when we would like to have a single instance. For instance if we want to connect to database , we can create one instance instead of many instances.

1. **Describe the purpose of the Factory design pattern.**

* When there is high level of complexity in code, Factory pattern would be convenient to use.
* Also when small objects and components share the same properties
* It provides a generic interface for creating the objects, where we can specify the type of the factory object we want to create.

1. **Describe the purpose of the publish and subscribe pattern.**

* It is a messaging pattern where senders of messages called the publishers do not program the message to be sent to receivers.
* Many senders can send messages to an entity on the server.
* Subscriptions are durable because they retain the copy of the message send to server unless the server receives the message, even though the server is crashed or restarted in between.

1. **Describe the purpose of the decorator pattern.**

* Objects can be wrapped and decorated with new behavior and then continue to use without worrying of the base object being modified.
* It provides flexible alternative to sub classing.
* For instance there is vehicle class which only consists of the vehicle type of car, but now using decorator pattern you can add other vehicle types like truck and set its model, price etc.

1. **Write JavaScript pseudo code that illustrates any design pattern that you can remember and identify the pattern you are illustrating.**

* Prototype Pattern

<html>

<head>

<script>

function myClassA()

{

this.ppt1=10;

this.ppt2=20;

}

myClassA.prototype.myMethod1=function()

{

return this.ppt1;

}

myClassA.prototype.myMethod2=function()

{

return this.ppt2;

}

function myClassB()

{

this.ppt3=70;

}

myClassB.prototype = new myClassA();

var test = new myClassB();

alert(test.ppt3 + test.myMethod2());

</script>

</head>

</html>

Output:90

Answer the following questions in 2-3 paragraphs. Each one is worth 10 points.

1. **You have been hired to design and manage a team of developers tasked with creating a web application. How would you explain to your developer the importance of using a version control system? Provide some practical examples that illustrate to your team how you will use version control to manage the development of the project.**

* Make my team aware of version control. What it is, what are the benefits of using it in our application. What difficulties might be faced in future if an application doesn’t have version control. Nowadays each and every company are using version control system to make their system more accurate, reliable and consistent.
* Version control is basically used to track and control the changes in a project files, in particular to a source code, documentation and web pages.
* It is so useful that it is used in every phase of the project. For instance in bug management, inter-developer communication, change the authorizations.
* It has several advantages:
* If we want to see the different versions of your code. How is it different. For instance we want to see whats the difference between the zend framework1.1 and the later version. You would find lot of new features.
* If we want to see how much work is being done(when/where)
* If we make certain changes to a code and later on realize that we made a mistake
* If we want to try the new version without interfering with working code

1. **You have been hired to design and manage a team of developers tasked with creating a web application. How would you explain to your developer the importance of creating unit tests? Provide some practical examples that illustrate to your team why unit testing is important.**

* First explain my team what is unit Testing. Explain them by giving a presentation showing benefits of unit testing and drawbacks of not doing a unit testing. Since it is a major part of software development. It is to test the each single code whether it is working according to the requirement. If we do the unit testing then at that time we are aware of the code what we have written and why we have created a particular function ,properties and methods. So this helps us to easily solve the code at an initial stage. Also it gives us a clear idea of how our system will look. So if we want to do any changes it can be done very easily, without affecting other parts of the code.

If a company doesn’t do unit testing , and if in case a bug arises they will not be able to figure out where the problem. It might happen this can affect other code also. Later on, if it becomes necessary to do modification in the design that it would be very tedious and time consuming.

Answer the following questions in 1 sentence or less. Each one is worth 2 points each:

1. **Name 5 HTML “tags” and identify what each one does**
   1. \_\_\_\_<head>:The HEAD element contains the information about the document. It include script. It tells the browser where to find the stylesheet, meta data information and many more.
   2. \_\_\_\_<p>…</p>: It defines a paragraph in HTML. For Example:<p> Hello</p>

Output:Hello

* 1. \_\_\_\_<hr> It is used to create a horizontal line .
  2. \_\_\_\_<br>:It is used to break a sentence.
  3. \_\_\_\_<a>(hyperlink): It is a word or group of words or image we can click to go to other page.

<a href=”www.Google.com”>HperLink</a>

1. **Calculate the golden ratio for a web page that has a maximum width of 960 px.**

=>It divides the pages in two parts with width:367 and 593

1. **What is the proper name for the bolded HTML code part:**

<a **href**=”www.google.com>Google</a>

* Attribute

1. **What is the proper name for the bolded HTML code part:**

<**a** href=”www.google.com>Google</a>

=>element

1. **Write the CSS code that would turn each link green.**

* a{color : green;}

1. **Explain the purpose of the CSS property float.**

* It is used for positioning an element either left or right else top or bottom where text and inline elements would wrap around it.
* Syntax: float : left;
* float : right;
* float : none;

1. **Explain the purpose of the CSS property clear.**

* It specifies which sides of an element where other floating element are not allowed.
* Example:
* img{

float:left;

}

p.clear

{

clear:both;

}

No floating element allowed on left or right side of the specified paragraph.

1. **Explain the difference between an ID and a Class within the context of CSS.**

* The id selector is used to specify a style for a single element. It uses the id attribute of HTML element and is specified using #.
* Example: #p{

text-align : center;

color:red;

}

* The class selector is used to specify a style for a group of elements. It is used on several elements.

Example:

.h1{

align:center;

}

1. **Explain why you would include some JavaScript at the bottom of your web page rather than the top**.

* The code is written in order to keep record of number of persons who have visited a website.

1. **Given the following CSS code, write the corresponding HTML code that would be required to trigger the CSS rule.**

#myid .myclass h2 {

Color: green;

}

* <html>

<head>

<style>

#myid .myclass h2 {

Color: green;

}

</style>

</head>

<body>

<h2 class=”myclass”>Welcome</h2>

<p class =”myclass”>Hello World….</p>

<h1 id=”myid”>Final Exam</h1>

</body>

</html>

1. **What is the proper name for the bolded CSS code:**

**H1 {**

**Color: blue;**

**}**

* Selector { property : value }
* Block is the declaration block/decorative block.

1. **What is the proper name for the bolded CSS code:**

H1 {

**Color: blue;**

}

* { property : value }

1. **What is the proper name for the bolded CSS code:**

**H1** {

Color: blue;

}

* Selector

1. **What is the proper name for the bolded CSS code:**

H1 {

**Color:** blue**;**

}

* property

1. **What is the proper name for the bolded CSS code:**

H1 {

Color**: blue;**

}

* value

Bonus Points:

Create a repository on github and commit any file to it to demonstrate your ability to use Github. Include a link to the repository inside your test submission.