**Assignment 01 – Due on 09/04/18, 1.00pm**

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***Question 1***

What are some of the limitations of using an analogy of building architectures

towards software systems development?

**The toolsets are completely different. Building architects will use more physically tools, while software architectures use conceptual tools.**

***Question 2***

What are architectural styles? Provide any two examples of ‘architectural styles’

that characterize building architectures. What ‘requirements’ do they meet?

**An architectural style is a set of patterns that a design embodies.**

**1) Generic layer architecture**

Example:

UI

UI management / authentication / authorization

Core business logic / application functionality / utilities

system support / OS / database

Qualities:

lower layer provides service to upper layers

strict layering - each layer can only talk to adjacent

loose layering - layer can bypass intermediate layers and go directly to who it needs to talk to

Pros:

Simple

Organized

Easy to understand

Easy to add layers to top

Cons:

Latency with more layers

Hard to add layers to

**2) Pipe and Filter**

Example:

Invoice system

Language assembler

Qualities:

Used for data flow

Pros:

Good for serial processing

Each filter defines functionality so there is little or no overlap

Cons:

Filter going down can cause a bottleneck the bottom

***Question 3***

List any two differences between the traditional waterfall, agile, and spiral

software development models.

**Waterfall**

**Does not support changing requirements**

**Good for small projects**

**Agile**

**Does support changing requirements, while incremental development**

**Encourages face to face communication**

**Spiral**

**Does support changing requirements, while incremental development**

**Can turn into chaos, if the spiral does not terminate or spins out of control**

***Question 4***

Why is software architecture defined as “broad and shallow” while software

design is defined as “narrow and deep”?

**Architecture is more concerned with a high-level snapshot of the intended system.**

**Software design is more concerned with low level implementation details.**

***Question 5***

Describe how an architecture serves as a basis for analysis. What about

decision-making? What kinds of decision-making does an architecture empower?

(Problem 4, page 23 from the textbook)

**Architecture promotes interacting with many different stakeholders, from business analysts to end users. This process of interaction yields a lot of information from many different perspectives and gives the architect an opportunity to analyze system design from the human perspective**

***Question 6***

Search three different job websites for “Software Architect”. Include a summary

or actual job description (if short enough) for each job. What qualifications are

listed for the job? If salary is included, what is the listed salary?

<https://www.glassdoor.com/Job/software-architect-jobs-SRCH_KO0,18.htm>

**Summary:**

Design enterprise apps.

Determine operational flexibility

Improve operations

Develop scalable architecture

**Qualifications:**

Familiar with many languages

**Salary:**

79,000-140,000 per year

[**https://www.monster.com/jobs/q-software-architect-jobs.aspx?jobid=199806586**](https://www.monster.com/jobs/q-software-architect-jobs.aspx?jobid=199806586)

**Summary:**

- Collaborate on overall software architecture and development of the software products, including hands-on development, mentorship of team members, and definition and adoption of improved development processes.  
-Responsibility for collaborating on overall software architecture of software products  
-Ensure that all software releases are of appropriate quality and provide a premium user experience to our customers  
-Collaborate with other development team members, and cross-functional collaboration on certain initiatives  
-Provide mentorship and leadership to all developers, including periodic code reviews and technical design reviews  
-Understand and assist, as needed, in the full development stack

**Qualifications:**

- 8+ years professional experience in software development  
- Experience building scalable, cloud-based software  
- Strong full stack development experience with C# and JavaScript frameworks  
- Working experience with Azure or AWS (Azure preferred!)  
- RESTful APIs  
- Relational databases

**Salary:**

Not listed

<https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>

**Summary:**

Software developers are the creative minds behind computer programs. Some develop the applications that allow people to do specific tasks on a computer or another device. Others develop the underlying systems that run the devices or that control networks.

**Qualifications:**

Software developers usually have a bachelor’s degree in computer science and strong computer programming skills.

**Salary:**

$103,560 per year