CS 524 Homework #1

NOTE: Each homework assignment is individual. Sources of **all** used publications (websites, papers, books, etc.) must be clearly indicated.

Use the lecture slides, Chapters 1 and 2 of the textbook as well as *The NIST definition of Cloud Computing* (Special Publication 800-145) at http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf and other texts, as required, and provide answers to the following 10 questions. Each problem will be graded on a scale of **0 to 10 points,** for the maximum total of **100 points**.

1. Using the formulae for the first software business model , find the year where the cumulative support expense equals that of the initial licensing fee *p*, where *p* = $12,000 per user, and *c* = *0.40*. In how many years will the initial cost of software becomes 5% of the overall expenditure?

2. Give three examples of each, SaaS, PaaS, and IaaS.

3. In the definition of *Hybrid Cloud*, a term "Cloud bursting" is mentioned. Search the Web for its definitions. Do these definitions agree? If so, provide what you think is the best definition (you can rephrase it as you see fit). If not, explain the differences between the definitions.

4. What are the essential differences between the *public* and *private* cloud that have made CIOs worry about legal consequences of Shadow IT? Read the original text of the US Government acts mentioned in the text (HIPAA and SOX) and summarize each in one paragraph.

5. Consider the case of the *Instagram* as described in the textbook. How many employees and customers did it have at the time of the purchase by Facebook? How much did Facebook pay for it? What was the value that the purchased business has generated in the first two years, and what were the factors that enabled generating this value?

6. Familiarize yourself with the description of the *Amazon Elastic Cloud Computing* (http://aws.amazon.com/ec2/). What kind of a service model does it provide (i.e., SaaS, PaaS, IaaS, or a combination of these)? Please list the features that support your answer.

7. Consider the example of the *Zing Interactive Media* and explain how you would launch the same service today using Amazon EC2. Specifically list the steps (and costs) you would avoid by doing so.

8. Explain what *CPU pinning* is and how *Intel* supports it with API.

9. Study the Amazon EC2 SLA. What service commitment (in percentage) does it guarantee? What is the bound on the downtime in a year?

10. What is the “telecom-grade” service commitment? Who were the ETSI NFV Industry Specifications Group founders? List the areas where the NFV is expected to act. (Optional recommended reading: the ETSI NFV White Papers.)