1. The Blazer Bank has ten branches in Birmingham, Alabama. Currently, each branch maintains its own server room full of computer servers which store and process customer's confidential data and financial transactions as well as host each branch's public website. However, the Bank wants to consolidate the servers into a central data center and wants to save money by using the cloud computing diagram. Given this scenario, which cloud deployment model will be best suited for this project?

Hybrid

1. Please justify your answer to 1(a)
2. Imagine that you have a cool idea for a social media service, and you form a startup to do this. You do not have a lot of funds to launch your product. You may not have a lot of users in the beginning, but if your app goes viral, you may get hundreds of thousands of users soon. What advantages does the cloud computing paradigm bring to such startups and small businesses (Hint: think of the difference between launching such an app in the 1990s vs now. How are things different due to the cloud?)
3. Which of the following is NOT a property of cloud computing, according to the NIST definition?
4. Many of the technologies behind cloud computing were invented back in the 1960s and 1970s. For example, virtualization, client-server computing, resource sharing, etc. were developed many years ago. Yet, cloud computing only became possible in the early 2000s. Why weren't projects such as MULTICS become successful in the late 1960s and 1970s despite having the foundational technologies available? Discuss briefly.
5. What kind of delivery model is used in Amazon EC2?
6. Overleaf is a LaTeX editing platform, where users can log into overleaf's website using a browser and edit documents online. If overleaf uses a cloud, what kind of delivery model would that be?
7. Why are cloud data centers designed using modular hardware?
8. Suppose that your company is considering moving your local in-house data center to a public cloud. What are the pros and cons of using the cloud vs. your local in-house data center? Explain in detail.
9. What factors are important in choosing the location of a cloud data center? Explain briefly
10. The MapReduce pseudocode for the Word Count problem is provided below. (Reference: Wikipedia article on MapReduce).
11. What are the shortcomings of MapReduce that newer models such as Apache SPARK solve? How does SPARK do that?
12. Suppose that we want to provide real time and very low-latency image recognition, traffic analysis, pedestrian movement tracking, etc. on AB Campus and surrounding areas. Which type of cloud or cloud-like service is best suited for this?
13. Please justify your answer to 3.C.
14. Suppose that you are developing a Cryptocurrency trading application for mobile phones, Windows machines, MacBooks, and Linux machines. You are on a tight schedule and must release frequently. As a software developer, what problems do you face in terms of development, testing, and deployment? How does using containers solve these problems?
15. in cloud security, multi-tenancy is said to be the cause of many security issues. Why is then fundamental reason behind this?
16. Why does cloud file systems like GFS or Hadoop maintain separate metadata and file servers? Why don't they store both metadata and file contents on the same server?
17. In Mobile Edge Computing, where is the nearest computing node located at (i.e., the first level server that the users connect to)?