

**Homework #9**  
**(Solutions on January 28<sup>th</sup>, 2021)**

1. Name and characterize three classes of multimedia applications. Give one application example for each class.
2. Discuss the usage of UDP vs. TCP to stream multimedia.
3. What is jitter and how does it impact the playback of multimedia content? Which client-side mechanism can be used to compensate for jitter?
4. Assume a multimedia application streams data with a constant bit rate of 2Mbps. The network delay is between 0 and 2 seconds. How long does a client have to wait before it can begin to playback the stream and how much data does it have to buffer.
5. What is the goal of adaptive playout delay? Give a brief overview of the steps involved.
6. What is the role of RTCP? How can it be used to synchronize RTP streams?
7. Illustrate how a voice call is established using the Session Initiation Protocol.