Exercise Sheet 10

Exercise 1 (Peer-to-Peer)

1. Centralized services exist in...

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

2. No central point of attack exists with...
   (*Two answers are correct here.*)

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

3. No centralized services exist with...

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

4. Clients must know at least a single Peer to access systems, which implement...
   (*Two answers are correct here.*)

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

5. A central point of attack exists with...

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

6. Which architecture causes the biggest network overhead?

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

7. Which architecture causes the lowest network overhead?

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

8. Which architecture implements a kind of dynamic, centralized service?

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

9. Napster (1999 - 2001) implemented...

   ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

10. Which architecture implements Ultrapeers (= Supernodes)?

    ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

11. Gnutella v0.4 implements...

    ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

12. Gnutella v0.6 implements...

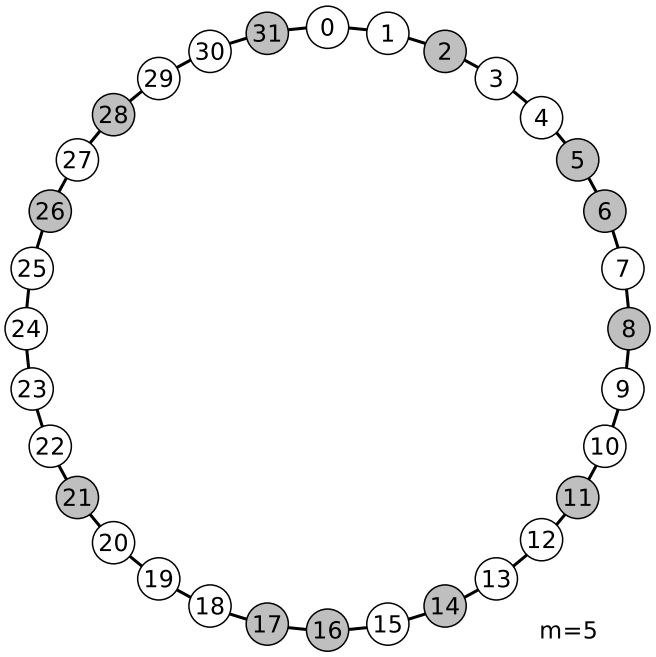
    ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

Exercise 2 (Distributed Hash Table)

1. What is the objective of hash functions?
2. How can the quality of a hash functions be determined?
3. What is the drawback of linear search in the Chord ring?
4. What way of searching in the Chord ring is preferred?
5. To which node n gets a key k assigned to?

   ☐ The node with the same ID as the key
   ☐ Direct predecessor
   ☐ Direct successor
   ☐ First node (starting from ID 1) without any keys assigned yet

6. Calculate the Finger Table values of node $n = 8$ and insert the correct values into the provided Finger Table.



Finger Table of node $n = 8$

Entry	Start	Node
1		
2		
3		
4		
5		

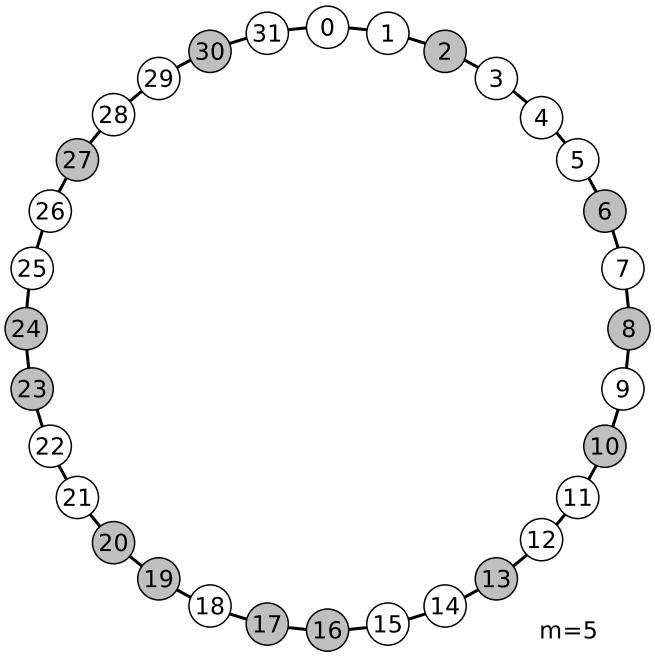
The table has 5 entries, because m contains the length of the ID in bits and $m = 5$

The Start value of entry i of the table on node n is $(n + 2^{i-1}) \bmod 2^m$

The Node value of entry i points to the first node, which follows to n at a distance of at least 2^{i-1}

7. Which node is responsible for the key (resource) with ID 23 ?

8. Calculate the Finger Table values of node $n = 20$ and insert the correct values into the provided Finger Table.



Finger Table of node $n = 20$

Entry	**Start**	**Node**
1		
2		
3		
4		
5		

The table has 5 entries, because m contains the length of the ID in bits and $m = 5$

The Start value of entry i of the table on node n is $(n + 2^{i-1}) \bmod 2^m$

The Node value of entry i points to the first node, which follows to n at a distance of at least 2^{i-1}

9. Which node is responsible for the key (resource) with ID 11 ?