Exercise Sheet 12

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...

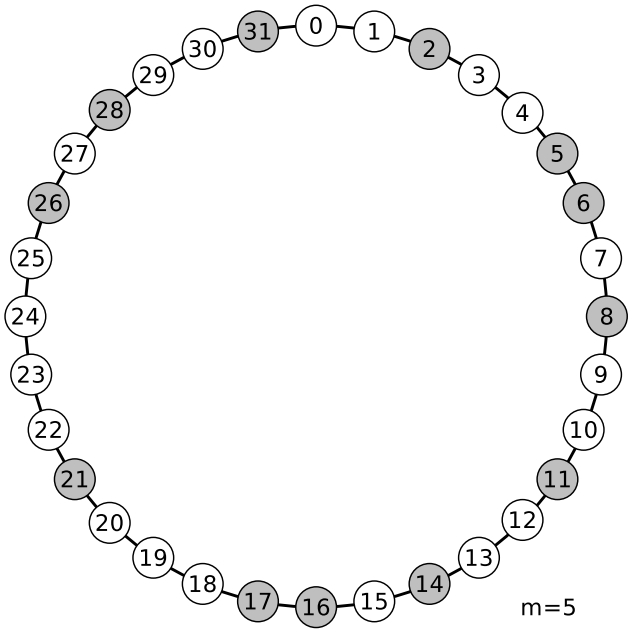
    ☐ Centralized P2P ☐ Pure P2P ☐ Hybrid P2P

Exercise 2 (Distributed Hash Table)

1. Why is **direct storage** of files in the Distributed Hash Table only suited for files $< 1\,\text{kB}$?
2. What kind of data is stored in the Distributed Hash Table when **indirect storage** is implemented?
3. What is the objective of **hash functions**?
4. How can the **quality** of a hash functions be determined?
5. What is the **drawback** of linear search in the Chord ring?
6. What way of **searching** in the Chord ring is preferred?
7. 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

8. 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		

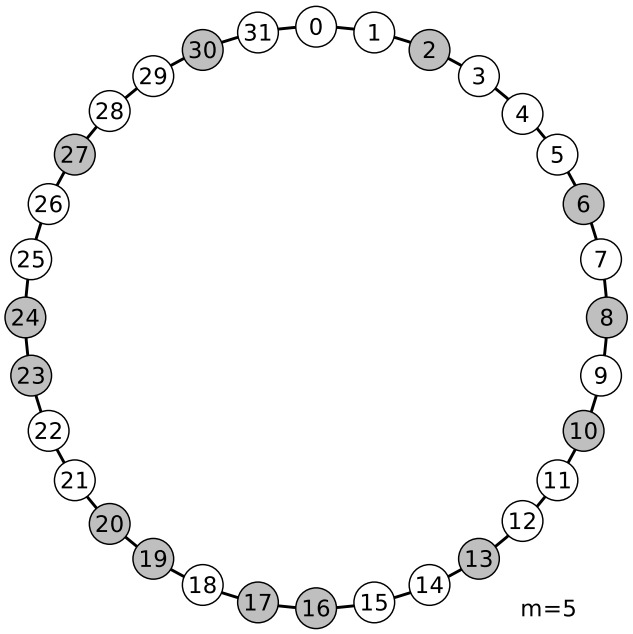
The table has 5 entries, because m contains the length of the ID in bits and $m = 5$

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

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 23 ?

10. Calculate the **Finger Table values** of node $n = 13$ and **insert** the correct values into the provided Finger Table.



Finger Table of node $n = 13$

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 $n + 2^{i-1}$

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

11. Which node is responsible for the key (resource) with ID 18 ?