Problems

1. **Problem 1**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{2}\right) + 1 & \text{if } n > 1 \end{cases}$$

2. **Problem 2**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ 2 \times T\left(\dfrac{n}{2}\right) + 1 & \text{if } n > 1 \end{cases}$$

3. **Problem 3**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{2}\right) + n & \text{if } n > 1 \end{cases}$$

4. **Problem 4**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{3}\right) + 2 & \text{if } n > 1 \end{cases}$$

5. **Problem 5**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ 3 \times T\left(\dfrac{n}{2}\right) + n & \text{if } n > 1 \end{cases}$$

6. **Problem 6**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ 2 \times T\left(\dfrac{n}{2}\right) + \log n & \text{if } n > 1 \end{cases}$$

7. **Problem 7**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{4}\right) + n^2 & \text{if } n > 1 \end{cases}$$

8. **Problem 8**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{2}\right) + \sqrt{n} & \text{if } n > 1 \end{cases}$$

9. **Problem 9**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{5}\right) + 3n & \text{if } n > 1 \end{cases}$$

10. **Problem 10**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ 4 \times T\left(\dfrac{n}{2}\right) + n^3 & \text{if } n > 1 \end{cases}$$

11. **Problem 11**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T\left(\dfrac{n}{3}\right) + n \log n & \text{if } n > 1 \end{cases}$$

12. **Problem 12**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T(n-1) + 2 & \text{if } n > 1 \end{cases}$$

13. **Problem 13**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T(n-1) + 3 & \text{if } n > 1 \end{cases}$$

14. **Problem 14**

$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T(n-1) + 4 & \text{if } n > 1 \end{cases}$$

15. **Problem 15**

$$T(n) = \begin{cases} 2 & \text{if } n = 1 \\ T(n-1) + 2 & \text{if } n > 1 \end{cases}$$

16. **Problem 16**

$$T(n) = \begin{cases} 2 & \text{if } n = 1 \\ T(n-1) + 3 & \text{if } n > 1 \end{cases}$$

17. **Problem 17**
$$T(n) = \begin{cases} 3 & \text{if } n = 1 \\ T(n-1) + 2 & \text{if } n > 1 \end{cases}$$

18. **Problem 18**
$$T(n) = \begin{cases} 3 & \text{if } n = 1 \\ T(n-1) + 4 & \text{if } n > 1 \end{cases}$$

19. **Problem 19**
$$T(n) = \begin{cases} 0 & \text{if } n = 1 \\ T(n-1) + 1 & \text{if } n > 1 \end{cases}$$

20. **Problem 20**
$$T(n) = \begin{cases} 5 & \text{if } n = 1 \\ T(n-1) + 5 & \text{if } n > 1 \end{cases}$$

21. **Problem 21**
$$T(n) = \begin{cases} 1 & \text{if } n = 1 \\ T(n-2) + 3 & \text{if } n > 1 \end{cases}$$