1. What is the time complexity of Kadane's algorithm?
   1. **O(n)**
   2. O(n^2)
   3. O(log n)
   4. O(1)
2. Kadane's algorithm is used to find the \_\_\_\_\_\_\_\_\_\_\_.
   1. **Maximum subarray sum**
   2. Minimum subarray sum
   3. Both maximum and minimum subarray sum
   4. Subarray with a specific sum
3. Which of the following is true regarding Kadane's algorithm?
   1. It only works for positive numbers
   2. It only works for negative numbers
   3. **It works for both positive and negative numbers**
   4. It only works for arrays of size greater than 100
4. What is the space complexity of Kadane's algorithm?
   1. **O(1)**
   2. O(n)
   3. O(log n)
   4. O(n^2)
5. Kadane's algorithm is also known as \_\_\_\_\_\_\_\_\_\_\_ algorithm.
   1. Maximum sum algorithm
   2. Subarray algorithm
   3. Dynamic programming algorithm
   4. **Greedy algorithm**
6. The prime sieve algorithm is used to generate \_\_\_\_\_\_\_\_\_\_\_.
   1. **Prime numbers up to a given limit**
   2. Composite numbers up to a given limit
   3. All numbers up to a given limit
   4. Perfect numbers up to a given limit
7. The time complexity of the prime sieve algorithm is \_\_\_\_\_\_\_\_\_\_\_.
   1. **O(n)**
   2. O(n^2)
   3. O(log n)
   4. O(n log n)
8. Which of the following data structures is commonly used in the prime sieve algorithm?
   1. **Array**
   2. Linked list
   3. Stack
   4. Binary tree
9. The prime sieve algorithm works based on the principle of \_\_\_\_\_\_\_\_\_\_\_.
   1. **Factorization**
   2. Addition
   3. Subtraction
   4. Multiplication
10. The prime sieve algorithm was developed by \_\_\_\_\_\_\_\_\_\_\_.
    1. **Eratosthenes**
    2. Euclid
    3. Fibonacci
    4. Gauss
11. In mathematics, a vector represents \_\_\_\_\_\_\_\_\_\_\_.
    1. A scalar quantity
    2. A 2D shape
    3. **A quantity with both magnitude and direction**
    4. A mathematical constant
12. Which of the following operations cannot be performed on vectors?
    1. Addition
    2. Subtraction
    3. Multiplication
    4. **Division**
13. In C programming, vectors are commonly represented using \_\_\_\_\_\_\_\_\_\_\_.
    1. **Arrays**
    2. Linked lists
    3. Stacks
    4. Queues
14. The magnitude of a vector is a \_\_\_\_\_\_\_\_\_\_\_.
    1. **Scalar quantity**
    2. Vector quantity
    3. Complex number
    4. Matrix
15. The dot product of two vectors is \_\_\_\_\_\_\_\_\_\_\_.
    1. **A scalar quantity**
    2. A vector quantity
    3. A complex number
    4. A matrix
16. Vectors can be added by \_\_\_\_\_\_\_\_\_\_\_.
    1. **Adding corresponding elements**
    2. Subtracting corresponding elements
    3. Multiplying corresponding elements
    4. Dividing corresponding elements
17. Which of the following is not a valid vector operation?
    1. Scalar multiplication
    2. Vector cross product
    3. **Vector division**
    4. Vector projection
18. The components of a vector are usually represented using \_\_\_\_\_\_\_\_\_\_\_.
    1. **Cartesian coordinates**
    2. Polar coordinates
    3. Spherical coordinates
    4. Cylindrical coordinates
19. Which of the following is true about vector addition?
    1. Order of addition matters
    2. Commutative property holds
    3. Associative property holds
    4. **Both b) and c)**
20. Vector subtraction can be performed by \_\_\_\_\_\_\_\_\_\_\_.
    1. Adding the negative of the second vector
    2. Subtracting the negative of the second vector
    3. Multiplying the second vector by -1
    4. **Both a) and c)**
21. Kadane's algorithm is commonly used to solve problems related to \_\_\_\_\_\_\_\_\_\_\_.
    1. Sorting
    2. Graphs
    3. Strings
    4. **Arrays**
22. In the context of Kadane's algorithm, a subarray refers to \_\_\_\_\_\_\_\_\_\_\_.
    1. **An array with consecutive elements**
    2. An array with random elements
    3. An array with sorted elements
    4. An array with repeated elements
23. Kadane's algorithm can be applied to solve which of the following problems?
    1. Finding the largest prime number
    2. Finding the longest common subsequence
    3. **Finding the maximum profit in stock trading**
    4. Finding the shortest path in a graph
24. The main advantage of Kadane's algorithm is \_\_\_\_\_\_\_\_\_\_\_.
    1. Its simplicity
    2. **Its efficiency**
    3. Its accuracy
    4. Its flexibility
25. Kadane's algorithm is an example of a \_\_\_\_\_\_\_\_\_\_\_ algorithm.
    1. **Greedy**
    2. Dynamic programming
    3. Backtracking
    4. Divide and conquer
26. The prime sieve algorithm can be used to find the \_\_\_\_\_\_\_\_\_\_\_ prime number.
    1. **Nth**
    2. Largest
    3. Smallest
    4. Composite
27. The prime sieve algorithm can efficiently generate prime numbers up to \_\_\_\_\_\_\_\_\_\_\_.
    1. 100
    2. 1,000
    3. 10,000
    4. **Any given limit**
28. The prime sieve algorithm is commonly used in problems related to \_\_\_\_\_\_\_\_\_\_\_.
    1. Encryption
    2. Network routing
    3. **Number theory**
    4. Data compression
29. Which of the following is not an optimization technique used in the prime sieve algorithm?
    1. Sieve of Eratosthenes
    2. Sieve of Sundaram
    3. Sieve of Atkin
    4. **Sieve of Newton**
30. The prime sieve algorithm works by \_\_\_\_\_\_\_\_\_\_\_finding and eliminating multiples of prime numbers.
    1. Dividing the given limit by all numbers
    2. **Checking divisibility of numbers by all primes**
    3. Factorizing all numbers up to the given limit
    4. Multiplying all numbers up to the given limit
31. In the prime sieve algorithm, vectors are commonly used to \_\_\_\_\_\_\_\_\_\_\_.
    1. **Store the prime numbers**
    2. Store the composite numbers
    3. Perform arithmetic operations on numbers
    4. Implement dynamic programming algorithms
32. Vectors can efficiently store and manipulate \_\_\_\_\_\_\_\_\_\_\_.
    1. Prime numbers
    2. Composite numbers
    3. **Both prime and composite numbers**
    4. Only small integers
33. Which of the following is a valid application of vectors in the context of prime numbers?
    1. Finding the prime factors of a number
    2. Checking if a number is prime
    3. Generating prime numbers up to a given limit
    4. **All of the above**
34. The use of vectors in the prime sieve algorithm helps in \_\_\_\_\_\_\_\_\_\_\_.
    1. **Optimizing memory usage**
    2. Improving computational speed
    3. Ensuring accurate results
    4. Simplifying the algorithm
35. Combining vectors with the prime sieve algorithm provides a \_\_\_\_\_\_\_\_\_\_\_ solution for prime number-related problems.
    1. **Dynamic**
    2. Static
    3. Deterministic
    4. Probabilistic