

Maths Concepts

&

Qns

video-2



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Motivation :-

If you have the patience to do what others can't, you are already ahead of them.



MIK...

Binary Exponentiation

OR,

Fast Exponentiation

What is it ??

It is one of the most efficient ways to
calculate large powers a^b

a^b in $O(\log b)$ time

What's wrong with Naive Exponentiation ???

a^b

$$2^{10} \rightarrow \underbrace{2 * 2 * 2 * \dots * 2}_{10 \text{ times}}$$

$$\text{Time} = O(b)$$

Using fast exponentiation

Example:- $2^{10} = 2^5 * 2^5$

$$\text{Time} = O(\log(b))$$

Key Concept :-

$$a^b = \begin{cases} (a^{b/2})^2 & , \text{ if } b \text{ is even} \\ a * (a^{b/2})^2 & , \text{ if } b \text{ is odd} \end{cases}$$

Example :-

$$3^{12} : a = 3, b = 12 \text{ (even)}$$

$$\hookrightarrow \text{val} = 3^{12/2} \text{ i.e. } 3^6$$

$$\text{result} = \text{val} * \text{val} ;$$

$$3^{13} : a = 3, b = 13 \text{ (odd)}$$

$$(3 * 3^{12})$$

$$\hookrightarrow \text{val} = 3^{13/2} \text{ i.e. } 3^6$$

$$\text{result} = \text{val} * \text{val} ; 3^6 * 3^6 = 3^{12}$$

$$\text{result} = 3 * \text{result} ;$$

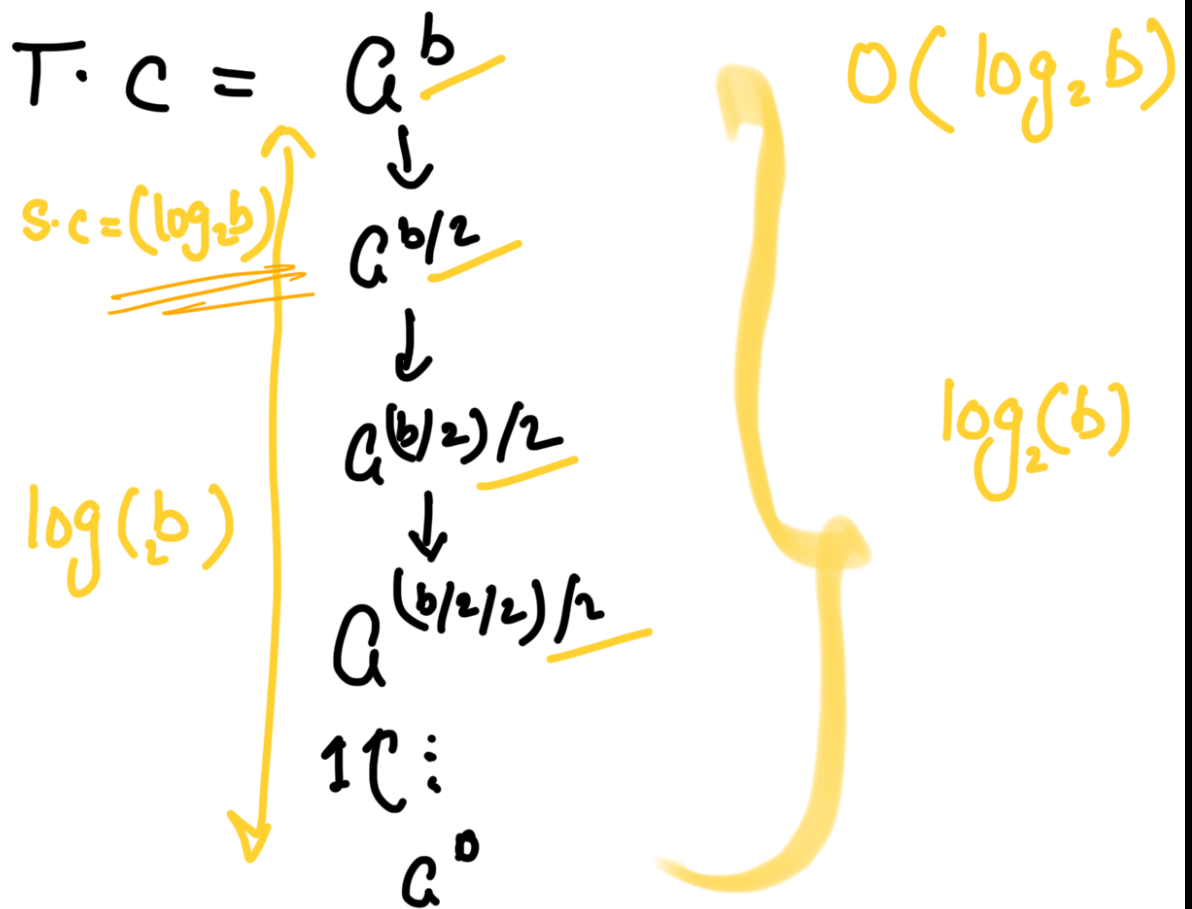
Recursive code

```
int findPower ( int a, int b) {  
    if (b == 0)  
        return 1 ;  
    int half = findPower (a, b/2) ;  
    int result = ((half * half) % M) ;  
}
```

```

    if ( b % 2 == 1 ) {
        result = (result * a) % M ;
    }
    return result;
}

```



Iterative Code

Note : Iterative code is faster than Recursive code ...

Video - 3

the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million (1990–1999) (Department of Health 2000).

There is a growing emphasis on the need to improve the efficiency of the public sector, and to ensure that the public sector is able to deliver the best possible value for money. This has led to a number of initiatives, including the introduction of competition, the restructuring of public sector organisations, and the introduction of performance measures. The aim of these initiatives is to ensure that the public sector is able to deliver the best possible value for money, and to ensure that the public sector is able to deliver the best possible quality of service.

The aim of this paper is to review the literature on the impact of the public sector on the private sector, and to discuss the implications of the findings for the future of the public sector. The paper is structured as follows: first, a brief overview of the public sector is given; second, the impact of the public sector on the private sector is reviewed; third, the implications of the findings for the future of the public sector are discussed.

2. Public sector

The public sector is the part of the economy that is owned and controlled by the state. It includes the government, the local authorities, and the public corporations.

The public sector is responsible for providing a range of services, including health care, education, and social security. It is also responsible for the provision of infrastructure, such as roads, bridges, and public transport.

The public sector is a major part of the economy, and it plays a significant role in the provision of public services. It is also a major employer, and it provides a significant source of revenue for the state.

The public sector is a complex organisation, and it is subject to a number of constraints. These constraints include the need to provide a range of services, the need to provide a high quality of service, and the need to provide a good value for money.

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the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million, from 2.5 million in 1980 to 4 million in 1995. The public sector has become a major employer in the UK, and its growth has been a major factor in the overall growth of the economy. The public sector has also become a major source of social services, and its growth has been a major factor in the overall growth of the economy. The public sector has also become a major source of social services, and its growth has been a major factor in the overall growth of the economy.

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