

$\Gamma_{p \oplus q}$

$$0 \cdot 2^h - 1$$

$$"10010" \xrightarrow{r_{xy}} "01001"$$

$$1) 2^h - h$$

$$2) \sum_{i=0}^{h-1} z_i \cdot 2^i$$

$$3) dp[m] = (dp[m/2] > 1) \mid ((m \times 2) < m-1)$$

$$m_1 = 11010 \xrightarrow{r_{xy}} 01101$$

$$m_2 = 01101 \xrightarrow{r_{xy}} 11010$$

$$\begin{cases} -1 \times 2 = -1 \\ -1 \times 1 = -1 \end{cases}$$

Γραφή



$$G = (V, E)$$

$$V = \{1, 2, 3, 4\}$$

$$E = \{(1, 2), (2, 3), (1, 3), \dots\}$$

- 1) Vertex
- 2) edge, arc
- 3)  $\deg(v)$



- 4) undirected / directed




---

8) Simple / multigraph

9) cycle; path



5)  weighted / unweighted

c)  loop

10)  $\text{intdeg}(v) = \deg^+(v), \text{outdeg}(v)$



1)  $V \rightarrow \rightarrow \rightarrow \rightarrow u$   
 $V \in R_u$

2)  $\text{отн. гомоморфизма } \theta \text{ на } \mathbb{Z}_p$

- a)  $R \circ L$
- b)  $S \circ \pi$
- c)  $T \circ \pi$



$$V = \{a, \dots, h = 1\}$$

$E$ .

a) Список рѣбер

б) Направление цикла



в) Список смежных.

$$\text{adj}[v] = \{u \mid (v, u) \in E\}$$

✓

$v \in (v, u, \dots)$



г) Массив циклов

- vector into head (0, 1)

- vector edges -> edges (1, ...)



return edge->t

int to;

int next;

}

# Depth-First Search



Χρωματισμός χύκλου  $\Rightarrow 2$ ?



HPHOG  
(Forward)



OPERATIONS (Back)

HPHOG (Back)  
Cross

Myer Loop keep.



Myer - My Model  
Graph





Путь

Цикл

в вершине







Εξαι 3 ε ερωσε γυναι οη μελ κηεγδδκ κηεδα εδδ  
 ογκκκ

Λκκ



S R

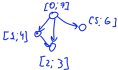


# Топологическая сортировка.



Directed Acyclic Graph  
= DAG





top sort :  $\{out\}$

LM



$\text{low}[v] > \text{low}[u]$





•



Sources  $\{2, \dots, i\}$

# Компоненты Сильной Связности.



$$\forall u, v: \begin{matrix} v \rightarrow u \\ u \rightarrow v \end{matrix}$$

1) Reflex

2) Symm

3) Trans

$$a \rightleftarrows b \rightleftarrows c$$

$O(V+E)$  $O(V+E)$ 

for  $v = 0 \dots h-1$   
 if completed:

 $O(V(V+E))$ DFS<sub>1</sub> → VIS<sub>1</sub>DFS<sub>2</sub> → VIS<sub>2</sub>

for  $(h=0 \dots h-1)$ , from VIS<sub>1</sub>[ $h$ ] to VIS<sub>2</sub>[ $h$ ]  
 compsd[ $h$ ] = ~~comp~~-comp;

chd-comp++;