$$f(x) = n^2 + 4 \cdot \frac{n^{1.5}}{\sqrt{n}} + 83$$

$$g(x) = 7 + 2^{n+3} + 6 \cdot \sqrt[3]{n}$$

The correct answer is:

$$f(x) \in O(g(x))$$

$$f(x) \in o(g(x))$$

$$f(x) = n^2 \, log \, n^3 + 4 \cdot 4^n + 81$$

$$g(x) = 7 + \frac{n^{1.5}}{\sqrt{n}} + 5 \cdot 2^{2n}$$

The correct answer is:

$$f(x) \in \Theta(g(x))$$

,

$$f(x) \in \Omega(g(x))$$

,

$$f(x) \in O(g(x))$$

```
int find_c(int n)
  int c
  for(i=n; i > 0; i--)
    for(j=0; j < 3*n; j++)
      c++
  for(i=1; i < c; i++)
    if(odd(i))
      for(j=1; j < 900; j=j*3)
        c++
    else
      for(j=n; j > 0; j--)
        c++
  return c
```

The correct answer is:

$$\Theta(n^3)$$

$$f(x) = n\ log\ n^2 + 6 \cdot log\ n + 24$$

$$g(x) = \sqrt{n} + 4 \cdot \frac{n}{\sqrt{n}} + 36$$

The correct answer is:

$$f(x) \in \Omega(g(x))$$

$$f(x) \in \omega(g(x))$$

Olgu:

$$f(x) = n^{1/2} + 3 \cdot n^2 + 65$$

$$g(x) = 8 + 2^{n+3} + 2 \cdot \frac{n}{\sqrt{n}}$$

The correct answer is:

$$f(x) \in o(g(x))$$

,

$$f(x) \in O(g(x))$$

```
int find_c(int n)
  int c
  for(i=2*n; i > 0; i--)
    for(j=n*n; j > 0; j--)
      c++
  for(i=1; i < c; i++)
    if(odd(random(0...999)))
      for(j=n; j > 0; j--)
        c++
    else
      for(j=400; j > 1; j--)
        c++
  return c
```

The correct answer is:

$\Theta(n^4)$

```
int find_c(int n)
  int c
  for(i=2*n; i > 0; i--)
    for(j=0; j < 3*n; j++)
      c++
  for(i=1; i < c; i++)
    if(even(i))
      for(j=0; j < 4*n*n; j++)
        c++
    else
      for(j=0; j < 3*n; j++)
        c++
  return c
```

The correct answer is:

$\Theta(n^4)$

$$f(x) = 2^{2n} + 6 \cdot \frac{n}{\sqrt{n}} + 86$$

$$g(x) = 4^n + 4 \cdot n \; log \; n^2 + 22$$

The correct answer is:

$f(x) \in \Omega(g(x))$

,

$f(x) \in O(g(x))$

,

$f(x) \in \Theta(g(x))$

$$f(x) = 2^8 + 3 \cdot n + 43$$

$$g(x) = 68 + n^{1/3} + 5 \cdot \sqrt[3]{n}$$

The correct answer is:

$f(x) \in \Omega(g(x))$

,

$f(x) \in \omega(g(x))$

```
int find_c(int n)
  int c
  for(i=0; i < 1000; i=1*2)
    for(j=0; j < 4*n*n; j++)
      c++
  for(i=1; i < c; i++)
    if(even(i))
      for(j=i; j < n*n; j++)
        c++
    else
      for(j=400; j > 1; j--)
        c++
  return c
```

The correct answer is:

$$\Theta(n^4)$$

Artur Gummel

Lisa tyhja binaarsesse otsingupuusse arvud:

46 3 33 93 60

Eemalda juurtipus olev arv.

Lisa arvud: **41** ja **18**

Kirjuta tippude vaartused juurtipust minimaalse elemendini (ehk tee tipust puu minimaalse elemendini). Numbrid eralda tyhikutega.

The correct answer is: 60 3

MAX-kuhjas teostatakse j2rgmised operatsioonid:

- enqueue(4)
- enqueue(24)
- enqueue(41)
- enqueue(47)
- dequeue()
- enqueue(18)
- enqueue(26)

Milline on p2rast neid operatsioone sellise kuhja massiivesitus? Andke vastus arvude jadana, kasutades arvude eraldajatena tyhikuid (nt. 1 2 3 4 5 6)

The correct answer is: 41 26 24 4 18

Antud on massiiv:

89 20 61 97 68 10 56 24 62 13

Sellele massiivile rakendatakse kuhjastamist Heapify algoritmiga (vt loengumaterjale), et tekiks MAX kuhi.

Millise kuju saab massiiv p2rast kuhjastamist? Andke vastusena arvude jada, kasutades arvude eraldajatena tyhikuid (nt. 1 2 3 4 5 6)

The correct answer is: 97 89 61 62 68 10 56 24 20 13

Lisa tyhja binaarsesse otsingupuusse arvud:

59 87 48 99 71

Eemalda juurtipus olev arv.

Lisa arvud: **42** ja **55**

Kirjuta tippude vaartused juurtipust minimaalse elemendini (ehk tee tipust puu minimaalse elemendini). Numbrid eralda tyhikutega.

Answer: 71 48 42 ✓

The correct answer is: 71 48 42

Question 2

Correct Mark 0.30 out of 0.30 Flag question

MAX-kuhjas teostatakse j2rgmised operatsioonid:

- enqueue(24)
- enqueue(15)
- enqueue(47)
- enqueue(9)
- enqueue(38)
- dequeue()
- enqueue(44)

Milline on p2rast neid operatsioone sellise kuhja massiivesitus? Andke vastus arvude jadana, kasutades arvude eraldajatena tyhikuid (nt. 1 2 3 4 5 6)

Answer: 44 38 24 9 15 ✓

The correct answer is: 44 38 24 9 15

Question 3

Correct Mark 0.30 out of 0.30 Flag question

Antud on massiiv:

48 26 18 90 16 24 29 78 57 93

Sellele massiivile rakendatakse kuhjastamist Heapify algoritmiga (vt loengumaterjale), et tekiks MAX kuhi.

Millise kuju saab massiiv p2rast kuhjastamist? Andke vastusena arvude jada, kasutades arvude eraldajatena tyhikuid (nt. 1 2 3 4 5 6)

Answer: 93 90 29 78 26 24 18 48 57 16 ✓

The correct answer is: 93 90 29 78 26 24 18 48 57 16

Question 1

Correct Mark 0.33 out of 0.33 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

1 3 72 39 89 111 122

Kustuta arvud: **39** ja **3**

Lisa arvud: **42** ja **43**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

Kokkuporgete lahendamiseks kasuta lineaarset sondeerimist.

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 0 1 89 -1 111 122 72 -1 0 42 43

Question 2

Correct Mark 0.33 out of 0.33 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

4 92 47 11 69 91 102

Kustuta arvud: **92** ja **102**

Lisa arvud: **10** ja **57**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

Kokkuporgete lahendamiseks kasuta ruutsondeerimist: h(x,i) = h'(x,i) + c1*i + c2*i^2, kus c1 = 0, c2 = 1)

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 11 91 57 47 4 -1 0 69 -1 0 10

Question 3

Correct Mark 0.34 out of 0.34 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

85 73 51 68 6 28 39

Kustuta arvud: **73** ja **51**

Lisa arvud: **18** ja **84**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

Kokkuporgete lahendamiseks kasuta topelthash-i funktsiooniga h2(x) = (x mod 7) + 1.

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 39 0 68 0 0 0 6 18 85 28 84

Question 1

Incorrect Mark 0.00 out of 0.33 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

93 25 40 44 12 34 45

Kustuta arvud: **25** ja **34**

Lisa arvud: **89** ja **90**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

Kokkuporgete lahendamiseks kasuta lineaarset sondeerimist.

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 44 12 89 90 45 93 0 40 0 0 0

Question 2

Incorrect Mark 0.00 out of 0.33 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

86 50 26 98 63 85 96

Kustuta arvud: **50** ja **26**

Lisa arvud: **66** ja **78**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

Kokkuporgete lahendamiseks kasuta ruutsondeerimist: h(x,i) = h'(x,i) + c1*i + c2*i^2, kus c1 = 0, c2 = 1)

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 66 85 96 0 -1 78 -1 0 63 86 98

Question 3

Incorrect Mark 0.00 out of 0.34 Flag question

Lisa 11-kohalisse hash tabelisse T arvud:

58 81 36 19 90 112 123

Kustuta arvud: **81** ja **36**

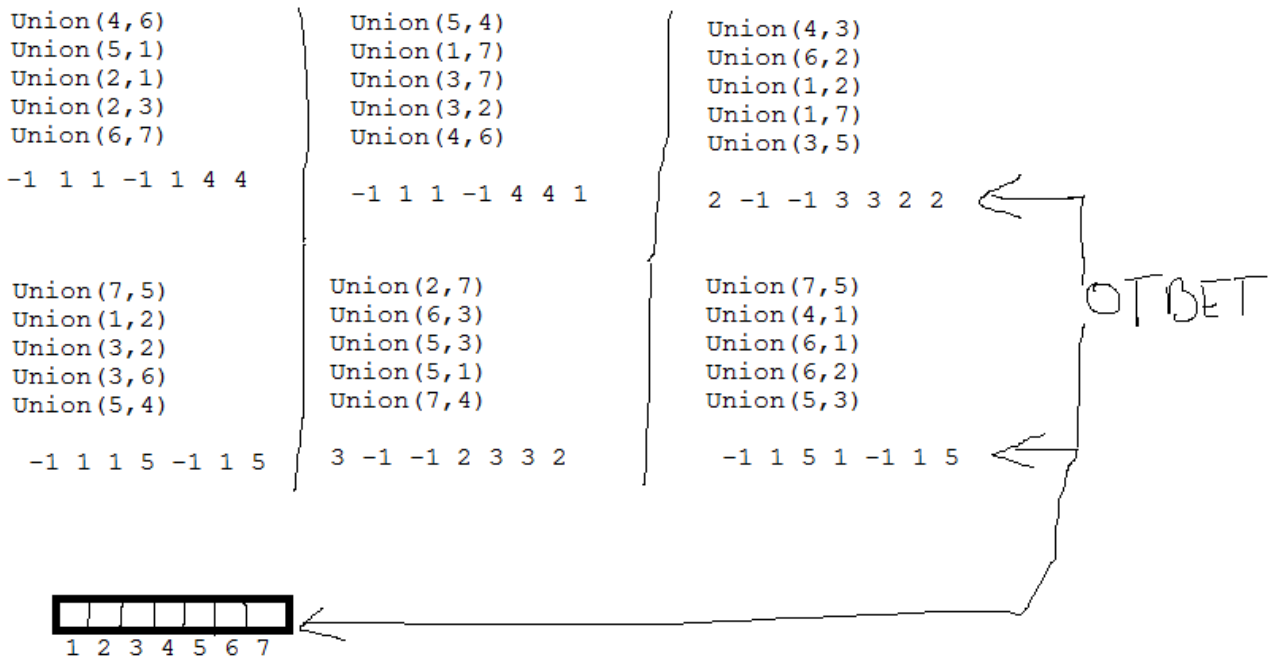
Lisa arvud: **22** ja **13**

Kustutamist tahistab **-1** ja tyhja kohta **0**. Hash funktsiooniks on h(x) = x mod 11.

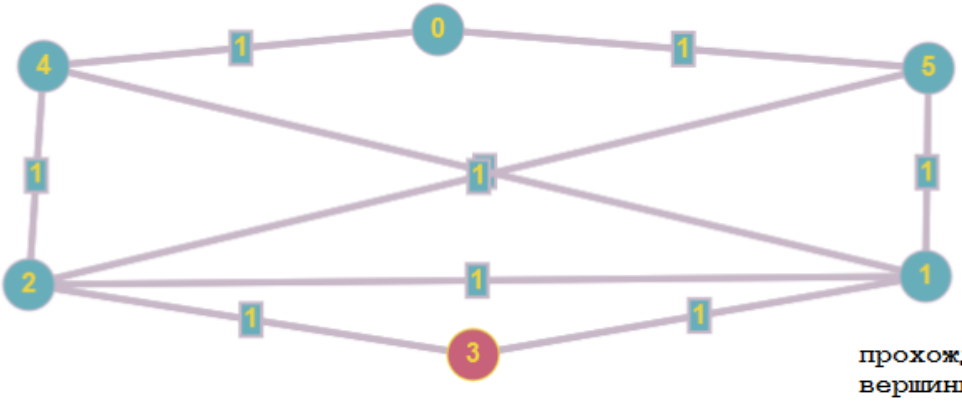
Kokkuporgete lahendamiseks kasuta topelthash-i funktsiooniga h2(x) = (x mod 7) + 1.

Esita saadud tabel arvude jadana, kasutades elementide eraldajatena tyhikuid: T[0] T[1] T[2] .. T[10]

The correct answer is: 22 0 90 58 -1 -1 112 123 19 13 0


Union(4,6)
Union(5,1)
Union(2,1)
Union(2,3)
Union(6,7)
-1 1 1 -1 1 4 4
Union(5,4)
Union(1,7)
Union(3,7)
Union(3,2)
Union(4,6)
-1 1 1 -1 4 4 1
Union(4,3)
Union(6,2)
Union(1,2)
Union(1,7)
Union(3,5)
2 -1 -1 3 3 2 2
Union(7,5)
Union(1,2)
Union(3,2)
Union(3,6)
Union(5,4)
-1 1 1 5 -1 1 5
Union(2,7)
Union(6,3)
Union(5,3)
Union(5,1)
Union(7,4)
3 -1 -1 2 3 3 2
Union(7,5)
Union(4,1)
Union(6,1)
Union(6,2)
Union(5,3)
-1 1 5 1 -1 1 5
ОТВЕТ
1 2 3 4 5 6 7

BFS прохождение вершин

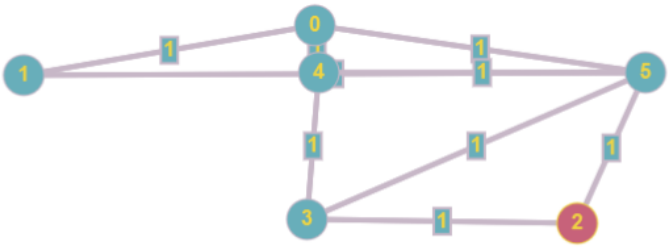


BFS

в ширину

прохождение от вершины 0 до конца

045213

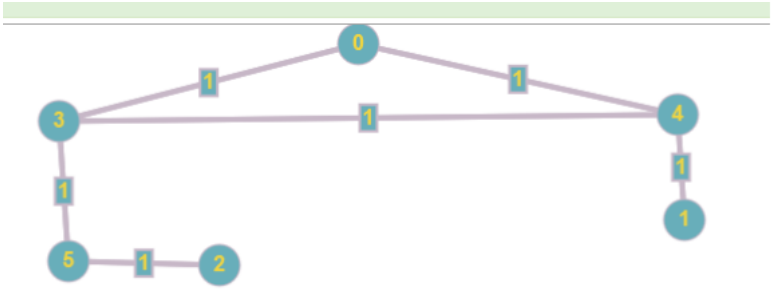


BFS

прохождение вершин

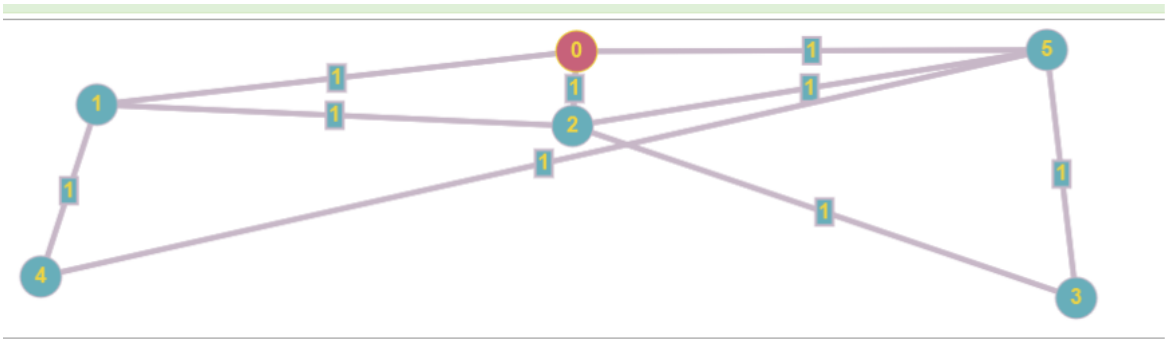
014532

Artur Gummel



0 3 4 5 1 2

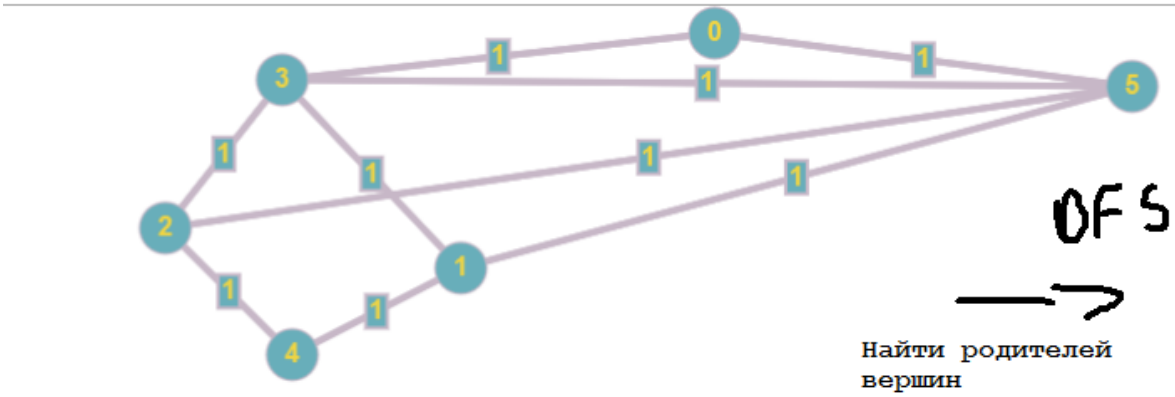
BFS



BFS

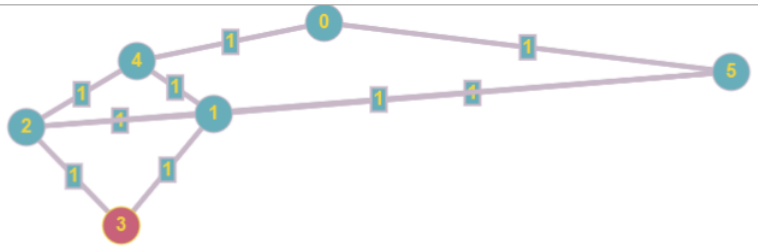
0 1 2 5 4 3

BFS родители вершин



Вершина	3	5	2	1	4
Родитель	0	0	3	3	1

3 3 0 1 0



BFS

родители вершин

Вершина	1	2	3	4	5
родитель	4	4	1	0	0

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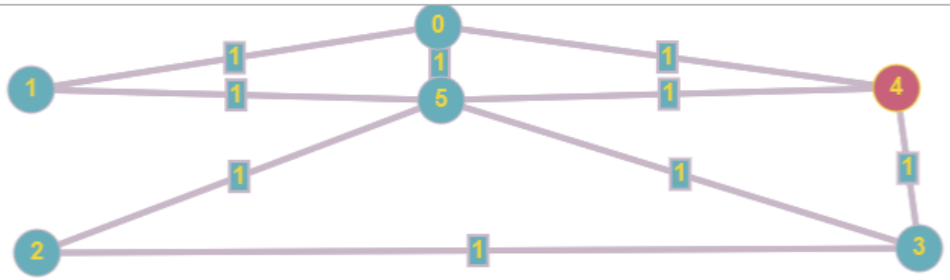
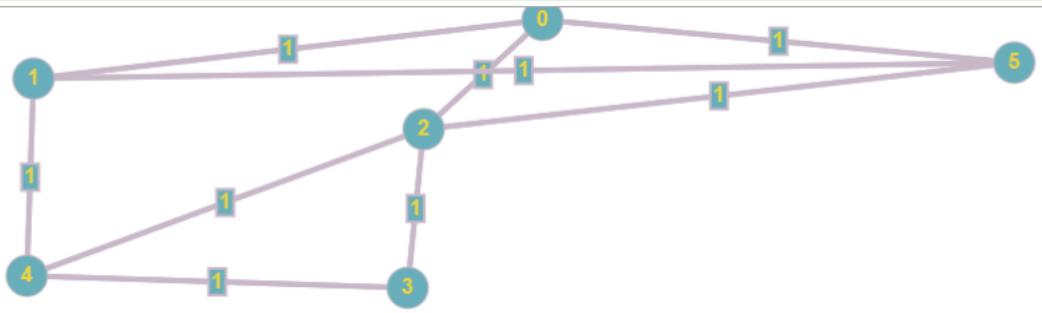
BFS
Найти родителей вершин



Вершина	1	2	3	4	5
Родитель	0	5	4	0	0



вершина	1	2	5	4	3
родитель	0	0	0	1	2

1	2	3	4	5
0	0	2	1	0

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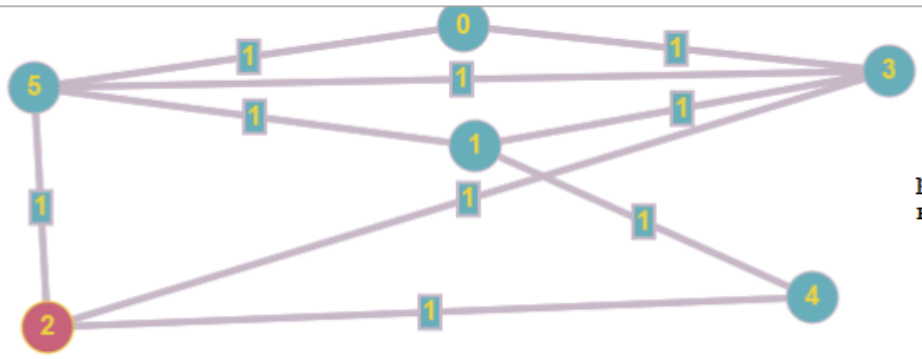
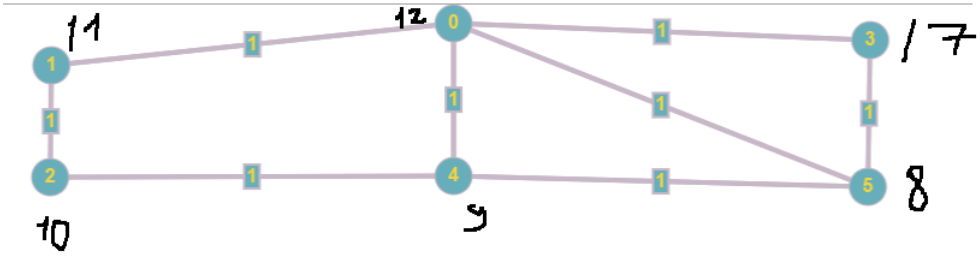


BFS

расстояние от вершины 0 до любой вершины

0 2 2 1 3 1

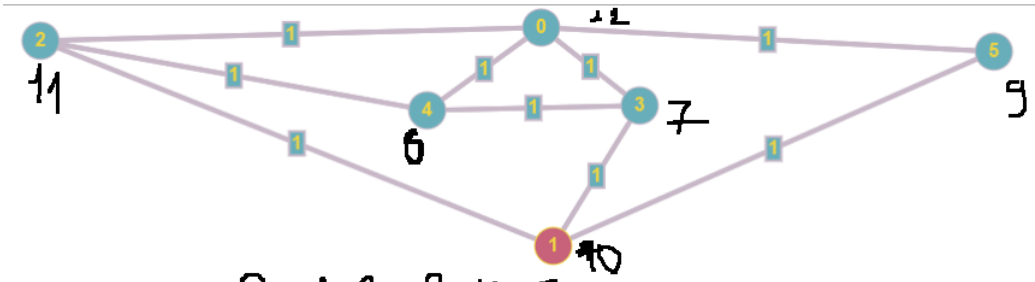
DFS значение вершин



Вершина	0	1	2	3	4	5
Значение	12	11	10	7	9	8

DFS

найти значения вершин

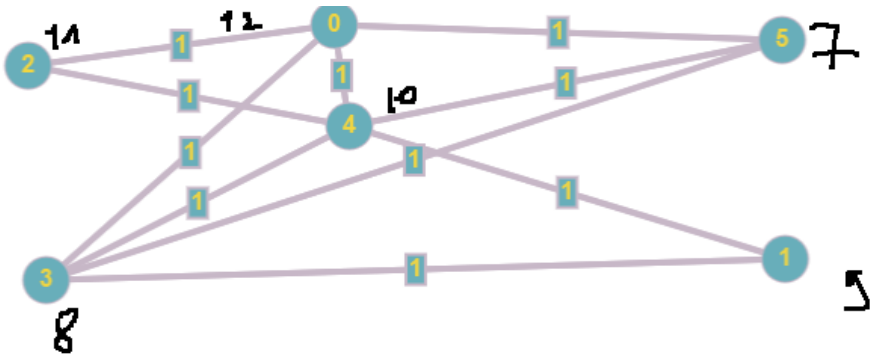


Вершина	0	1	2	3	4	5
Значение	12	11	10	7	6	9

DFS,

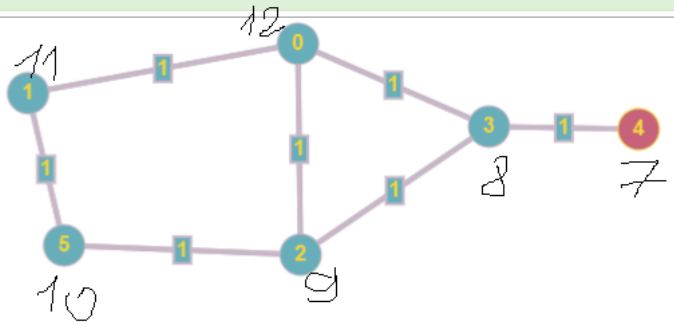
значение вершин

Artur Gummel



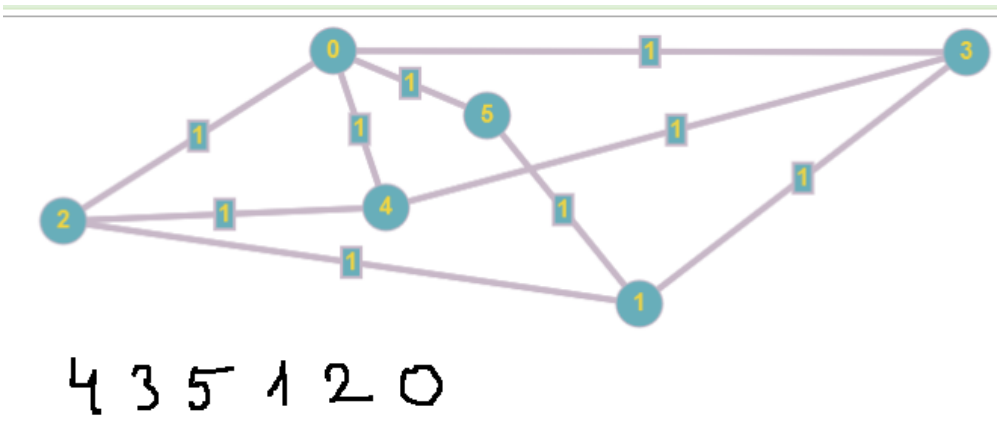
DFS
значение вершин

Вершина	0	1	2	3	4	5
Значение	12	9	11	8	10	7



DFS

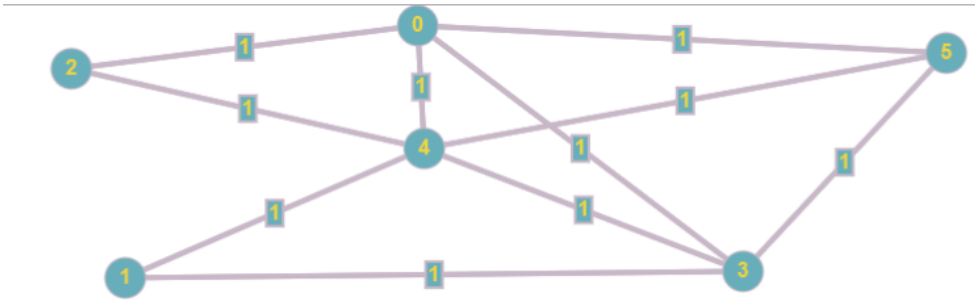
DFS прохождение вершин



DFS

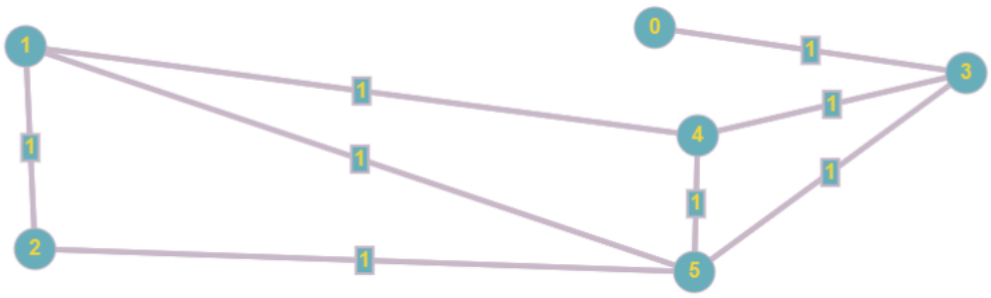
прохождение вершин

4 3 5 1 2 0



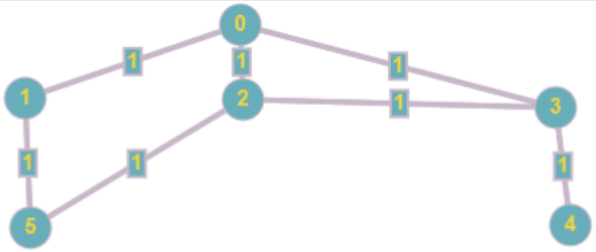
DFS
прохождение вершин

0 2 4 1 3 5 → 5 3 1 4 2 0



dfs

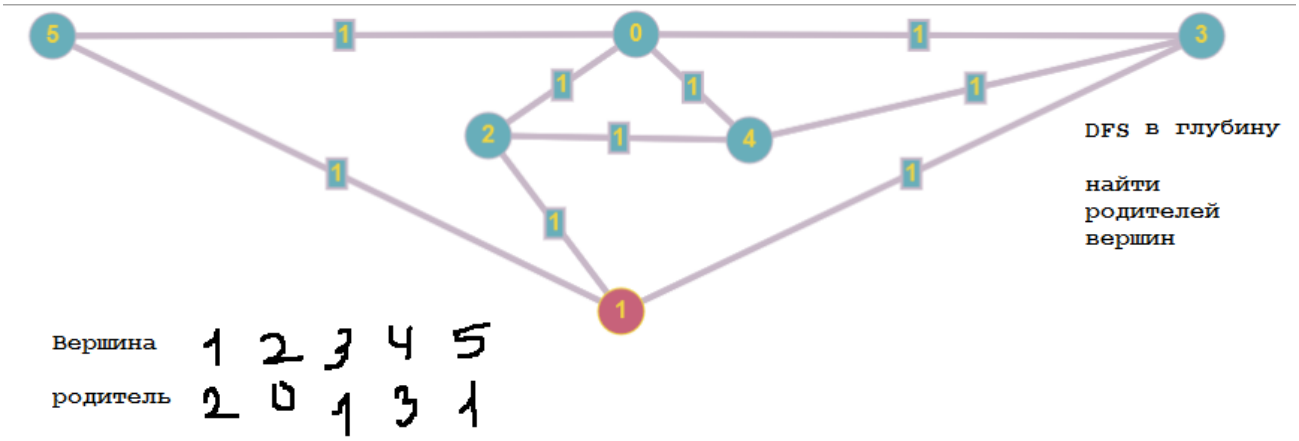
0 3 4 1 2 5 -> 5 2 1 4 3 0



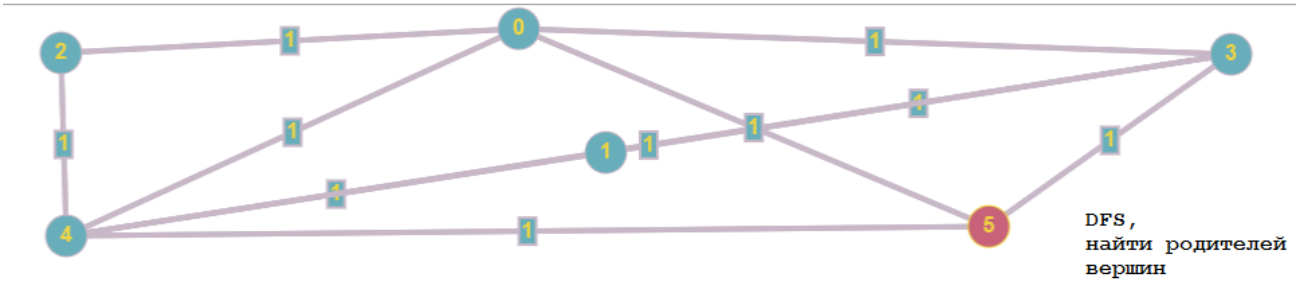
∞fs

0 1 5 2 3 4 -> 4 3 2 5 1 0

DFS родители вершин



Вершина	1	2	3	4	5
родитель	2	0	1	3	1



Вершина	1	2	3	4	5
Родитель	4	0	1	2	3

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