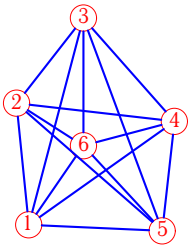


Алгоритм отжига

Найти длину гамильтонова цикла S_4 в полном графе K_6 после четырех циклов решения задачи методом отжига. Даны расстояния $L_{i,j}$ между вершинами. Даны также: начальная последовательность вершин L_0 , последовательность замен вершин Z и выпавшие при этом вероятности перехода P_k , $k = 1, \dots, 4$. Переход на худшее ($\Delta S_k = S_k - S_{k-1} > 0$) решение допустим, если $P_* = 100e^{-\Delta S_k/T_k} > P_k$, где снижение температуры происходит по закону $T_{k+1} = 0.5T_k$ от $T_1 = 100$ независимо от того, принято решение или нет. Если $\Delta S_k \leq 0$, то новое решение принимается.

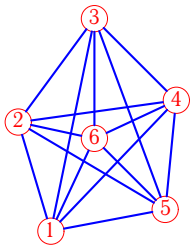
Задача 13.1. *Бондаренко Е*



Ребро	$L_{i,j}$
1-2	23
1-3	40
1-4	33
1-5	25
1-6	18
2-3	20
2-4	30
2-5	36
2-6	15
3-4	26
3-5	42
3-6	24
4-5	20
4-6	17
5-6	22

$V = [1, 4, 5, 3, 6, 2, 1].$
 $Z = [V_4 \rightleftharpoons V_5], [V_2 \rightleftharpoons V_3],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 94, 49, 98, 49.$

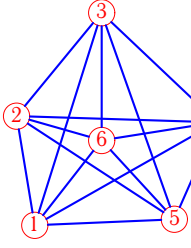
Задача 13.2. *Жук Александр*



Ребро	$L_{i,j}$
1-2	21
1-3	41
1-4	34
1-5	22
1-6	19
2-3	24
2-4	30
2-5	32
2-6	14
3-4	22
3-5	38
3-6	22
4-5	20
4-6	17
5-6	19

$V = [1, 3, 4, 5, 6, 2, 1].$
 $Z = [V_4 \rightleftharpoons V_6], [V_5 \rightleftharpoons V_2],$
 $[V_6 \rightleftharpoons V_2], [V_3 \rightleftharpoons V_4].$
 $P = 91, 84, 90, 85.$

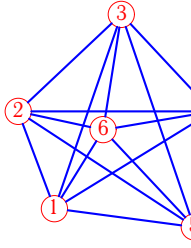
Задача 13.3. *Камчатова Елена*



Ребро	$L_{i,j}$
1-2	21
1-3	42
1-4	39
1-5	26
1-6	20
2-3	25
2-4	37
2-5	35
2-6	16
3-4	30
3-5	41
3-6	24
4-5	20
4-6	22
5-6	20

$V = [1, 4, 5, 3, 6, 2, 1].$
 $Z = [V_4 \rightleftharpoons V_5], [V_3 \rightleftharpoons V_5],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 49, 52, 46, 45.$

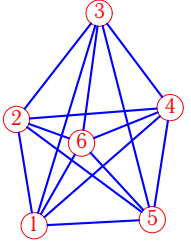
Задача 13.4. *Кирик К*



Ребро	$L_{i,j}$
1-2	19
1-3	38
1-4	35
1-5	26
1-6	17
2-3	26
2-4	36
2-5	39
2-6	16
3-4	25
3-5	42
3-6	22
4-5	22
4-6	21
5-6	25

$V = [1, 5, 3, 4, 2, 6, 1].$
 $Z = [V_4 \rightleftharpoons V_6], [V_3 \rightleftharpoons V_4],$
 $[V_2 \rightleftharpoons V_3], [V_5 \rightleftharpoons V_2].$
 $P = 39, 94, 62, 79.$

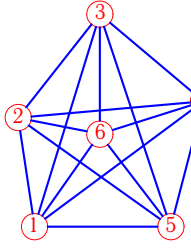
Задача 13.5. *Колотилин А*



Ребро	$L_{i,j}$
1-2	20
1-3	42
1-4	34
1-5	22
1-6	18
2-3	25
2-4	29
2-5	32
2-6	13
3-4	22
3-5	40
3-6	24
4-5	21
4-6	18
5-6	19

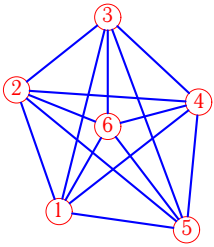
$V = [1, 4, 5, 6, 3, 2, 1].$
 $Z = [V_4 \rightleftharpoons V_6], [V_3 \rightleftharpoons V_5],$
 $[V_5 \rightleftharpoons V_6], [V_6 \rightleftharpoons V_2].$
 $P = 28, 45, 94, 30.$

Задача 13.6. *Ларионов Игорь*



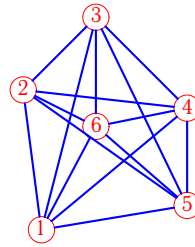
Ребро	$L_{i,j}$
1-2	20
1-3	42
1-4	39
1-5	25
1-6	21
2-3	25
2-4	35
2-5	35
2-6	15
3-4	25
3-5	42
3-6	22
4-5	24
4-6	20
5-6	22

$V = [1, 2, 3, 4, 5, 6, 1].$
 $Z = [V_3 \rightleftharpoons V_5], [V_4 \rightleftharpoons V_5],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 79, 53, 82, 59.$

Задача 13.7.*Лёвкин Сергей*

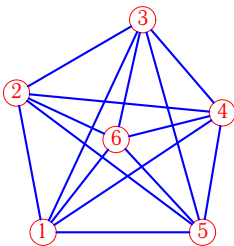
$V = [1, 4, 3, 2, 5, 6, 1].$
 $Z = [V_3 \rightleftharpoons V_4], [V_4 \rightleftharpoons V_6],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 81, 75, 24, 74.$

Ребро	$L_{i,j}$
1-2	24
1-3	37
1-4	33
1-5	24
1-6	18
2-3	22
2-4	34
2-5	41
2-6	18
3-4	23
3-5	42
3-6	20
4-5	24
4-6	17
5-6	24

Задача 13.8.*Малыгин Сергей*

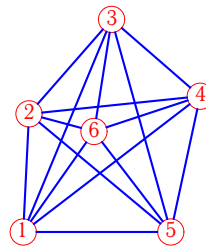
$V = [1, 2, 3, 4, 5, 6, 1].$
 $Z = [V_3 \rightleftharpoons V_5], [V_5 \rightleftharpoons V_2],$
 $[V_4 \rightleftharpoons V_5], [V_6 \rightleftharpoons V_2].$
 $P = 28, 31, 27, 13.$

Ребро	$L_{i,j}$
1-2	26
1-3	41
1-4	35
1-5	28
1-6	22
2-3	19
2-4	31
2-5	37
2-6	15
3-4	24
3-5	39
3-6	20
4-5	18
4-6	17
5-6	22

Задача 13.9.*Панин Антон*

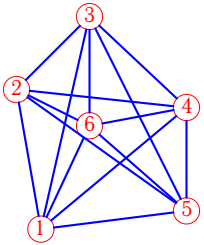
$V = [1, 4, 5, 3, 6, 2, 1].$
 $Z = [V_3 \rightleftharpoons V_4], [V_4 \rightleftharpoons V_6],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 65, 30, 75, 41.$

Ребро	$L_{i,j}$
1-2	26
1-3	44
1-4	40
1-5	30
1-6	22
2-3	27
2-4	39
2-5	44
2-6	20
3-4	23
3-5	41
3-6	23
4-5	23
4-6	20
5-6	24

Задача 13.10.*Плюхин Илья*

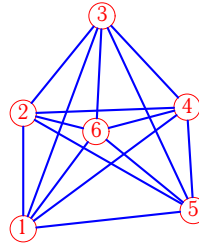
$V = [1, 2, 3, 4, 5, 6, 1].$
 $Z = [V_3 \rightleftharpoons V_5], [V_5 \rightleftharpoons V_2],$
 $[V_6 \rightleftharpoons V_2], [V_2 \rightleftharpoons V_3].$
 $P = 67, 67, 84, 67.$

Ребро	$L_{i,j}$
1-2	22
1-3	43
1-4	42
1-5	28
1-6	23
2-3	23
2-4	32
2-5	34
2-6	12
3-4	22
3-5	41
3-6	21
4-5	26
4-6	21
5-6	24

Задача 13.11.*Потанин А*

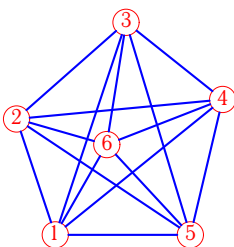
$V = [1, 3, 4, 2, 5, 6, 1].$
 $Z = [V_3 \rightleftharpoons V_5], [V_4 \rightleftharpoons V_6],$
 $[V_5 \rightleftharpoons V_6], [V_6 \rightleftharpoons V_2].$
 $P = 59, 46, 95, 53.$

Ребро	$L_{i,j}$
1-2	26
1-3	41
1-4	35
1-5	27
1-6	21
2-3	19
2-4	32
2-5	39
2-6	15
3-4	25
3-5	41
3-6	20
4-5	19
4-6	18
5-6	24

Задача 13.12.*Родионова Н*

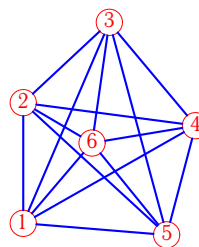
$V = [1, 3, 2, 4, 5, 6, 1].$
 $Z = [V_4 \rightleftharpoons V_5], [V_2 \rightleftharpoons V_4],$
 $[V_5 \rightleftharpoons V_6], [V_3 \rightleftharpoons V_4].$
 $P = 89, 70, 50, 72.$

Ребро	$L_{i,j}$
1-2	21
1-3	42
1-4	38
1-5	32
1-6	23
2-3	23
2-4	31
2-5	37
2-6	14
3-4	23
3-5	40
3-6	21
4-5	19
4-6	17
5-6	23

Задача 13.13.*Синицына Диана*

$V = [1, 4, 5, 3, 6, 2, 1].$
 $Z = [V_4 \rightleftharpoons V_5], [V_2 \rightleftharpoons V_4],$
 $[V_5 \rightleftharpoons V_2], [V_6 \rightleftharpoons V_2].$
 $P = 34, 82, 61, 83.$

Ребро	$L_{i,j}$
1-2	23
1-3	42
1-4	40
1-5	25
1-6	19
2-3	27
2-4	39
2-5	39
2-6	17
3-4	23
3-5	42
3-6	23
4-5	26
4-6	23
5-6	23

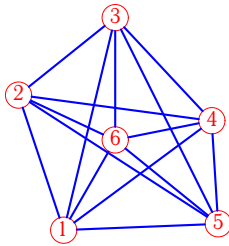
Задача 13.14.*Титов Игорь*

$V = [1, 3, 4, 5, 2, 6, 1].$
 $Z = [V_4 \rightleftharpoons V_5], [V_5 \rightleftharpoons V_2],$
 $[V_6 \rightleftharpoons V_2], [V_2 \rightleftharpoons V_3].$
 $P = 66, 48, 27, 46.$

Ребро	$L_{i,j}$
1-2	22
1-3	41
1-4	37
1-5	27
1-6	20
2-3	22
2-4	32
2-5	36
2-6	15
3-4	25
3-5	41
3-6	23
4-5	21
4-6	19
5-6	22

Задача 13.15.

Ткешелашвили Г

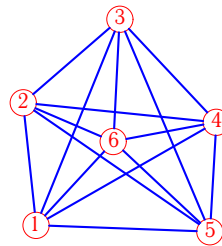


$V = [1, 4, 5, 3, 2, 6, 1].$
 $Z = [V_5 \rightleftharpoons V_2], [V_3 \rightleftharpoons V_5],$
 $[V_4 \rightleftharpoons V_5], [V_6 \rightleftharpoons V_2].$
 $P = 60, 78, 46, 77.$

Ребро	$L_{i,j}$
1-2	27
1-3	41
1-4	34
1-5	29
1-6	19
2-3	23
2-4	36
2-5	44
2-6	20
3-4	26
3-5	43
3-6	23
4-5	19
4-6	18
5-6	25

Задача 13.16.

Гольденберг П.

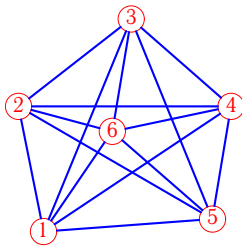


$V = [1, 4, 5, 6, 3, 2, 1].$
 $Z = [V_3 \rightleftharpoons V_4], [V_4 \rightleftharpoons V_5],$
 $[V_5 \rightleftharpoons V_6], [V_2 \rightleftharpoons V_4].$
 $P = 37, 55, 42, 51.$

Ребро	$L_{i,j}$
1-2	23
1-3	42
1-4	39
1-5	32
1-6	21
2-3	24
2-4	36
2-5	42
2-6	18
3-4	26
3-5	43
3-6	23
4-5	20
4-6	19
5-6	25

Задача 13.17.

Пурмахомад Б.



$V = [1, 4, 3, 2, 5, 6, 1].$
 $Z = [V_4 \rightleftharpoons V_6], [V_5 \rightleftharpoons V_2],$
 $[V_3 \rightleftharpoons V_4], [V_6 \rightleftharpoons V_2].$
 $P = 44, 23, 94, 30.$

Ребро	$L_{i,j}$
1-2	24
1-3	43
1-4	42
1-5	32
1-6	23
2-3	27
2-4	40
2-5	42
2-6	18
3-4	25
3-5	40
3-6	21
4-5	21
4-6	23
5-6	25