Bull
Red Bull

What happens next?

to ε. Then ye ray ae ‖ bd
is refracted to ye exterior focus (d). See l: Prop
3 Having ye proportion of d to ε, or bd: kf.
the Hyperbola may bee thus described.
1 Upon ye centers a, b
let ye instrument adbεc
bee moved in wch instrum
observe yt ad ⊥ dε ⊥ cεt
& yt the beame cεt is
not in ye same plane wth
adbε but intersects it at
ye angle tεv soe yt if
tv ⊥ εv, then d:ε:: εt: tv.
Or dε :: Rad: sine of ∠tεv.
Also make dε = g/2, i, ε
Ralf ye transverse diamr
Then place ye plate chm in the same plaine wth ab
& moving ye instrument adbεct to & fro its edge
cεt shall cut or weare it into ye shape of ye
desired Parabola. Or the plate chm may bee fil
away until ye edg cεt exactly touch it everywhere
2 By the same proceeding Des=Cartes concave
Hyperbolicall wheele may bee described by being
turned wth a chissell dεc whose edge is a streight
line inclined to the axis of the mandrill by ye ∠
wch angle is found by

Forces change your velocity.

Bull
Red Bull

Bull
Red Bull

Bull
Red Bull

Bull
Red Bull

Bull
Red Bull

Bull
Red Bull

Bull
Red Bull

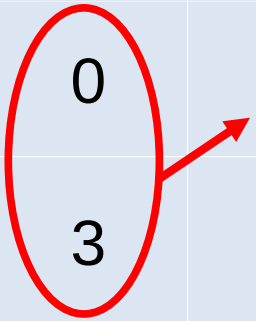
Bull
Red Bull

# Start with no height, and with velocity 3

| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | | | | | | | |
| Velocity | 3 | | | | | | | |
| Acceleration | -1 | | | | | | | |

What happens next?

| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | 3 | | | | | | |
| Velocity | 3 | | | | | | | |
| Acceleration | -1 | | | | | | | |



Velocity changes height

| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | 3 | | | | | | |
| Velocity | 3 | 2 | | | | | | |
| Acceleration | -1 | | | | | | | |

Acceleration changes velocity

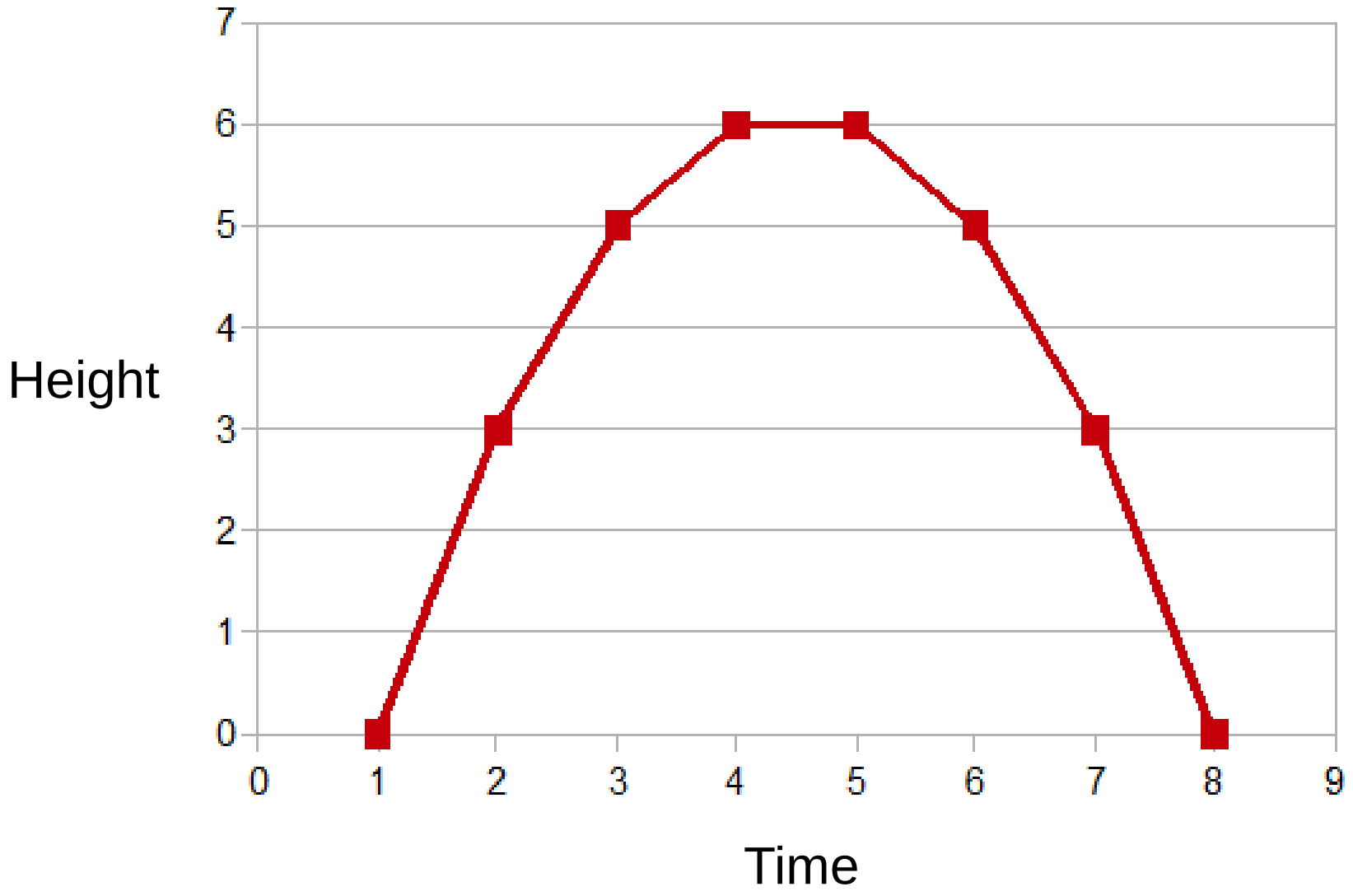
| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | 3 | | | | | | |
| Velocity | 3 | 2 | | | | | | |
| Acceleration | -1 | -1 | | | | | | |

Constant gravitational acceleration

| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | 3 | | | | | | |
| Velocity | 3 | 2 | | | | | | |
| Acceleration | -1 | -1 | | | | | | |

What happens next?

| Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Height | 0 | 3 | 5 | 6 | 6 | 5 | 3 | 0 |
| Velocity | 3 | 2 | 1 | 0 | -1 | -2 | -3 | -4 |
| Acceleration | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |


Height
7
6
5
4
3
2
1
0
0
1
2
3
4
5
6
7
8
9
Time

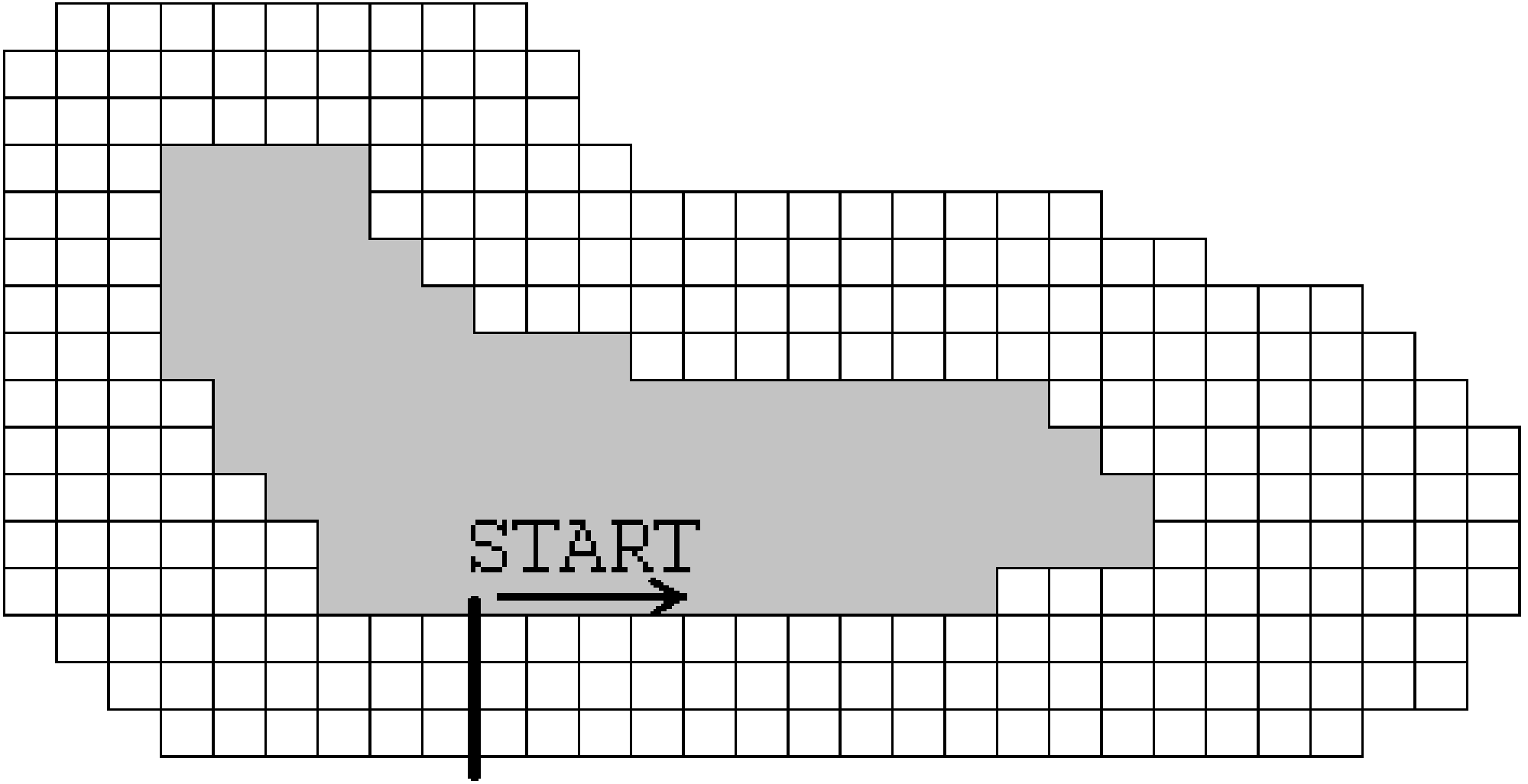
Bull
Red Bull

7
6
5
4
3
2
1
0
0
1
2
3
4
5
6
7
8
9
Bull
RedBull

RedBull
TOTAL
RENAULT
PETROMAS
KINGFISHER

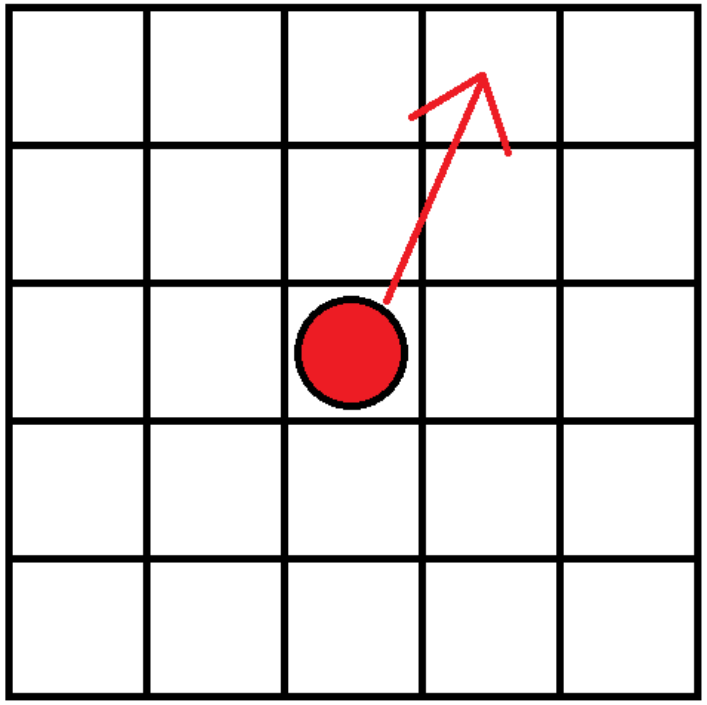
GRAN TURISMO

TIME
1st

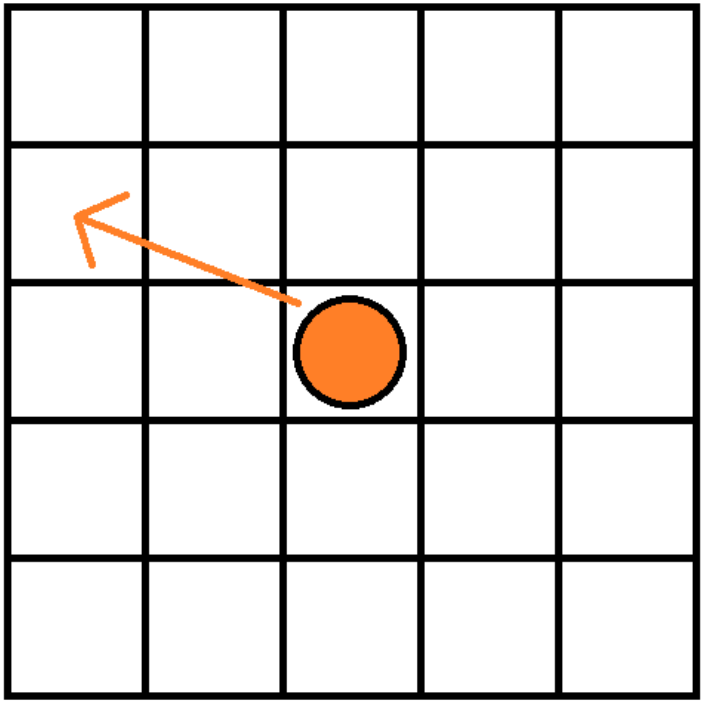

START

# Velocity

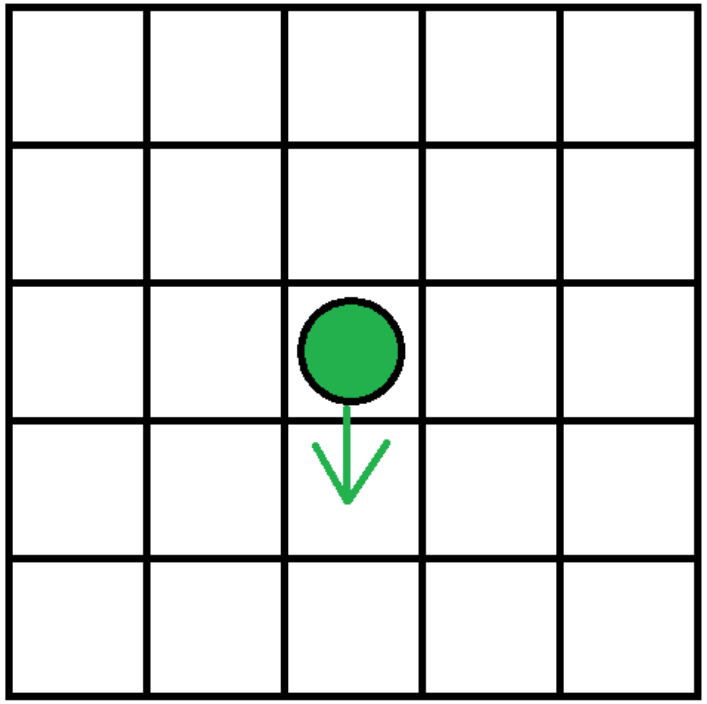
- Your velocity is how far you move each turn
- It's made up of two numbers, called the components of your velocity vector
- (4,1) means “move four squares right and 1 square up”
- (-3,0) means “move three squares left and no squares up or down”
- …



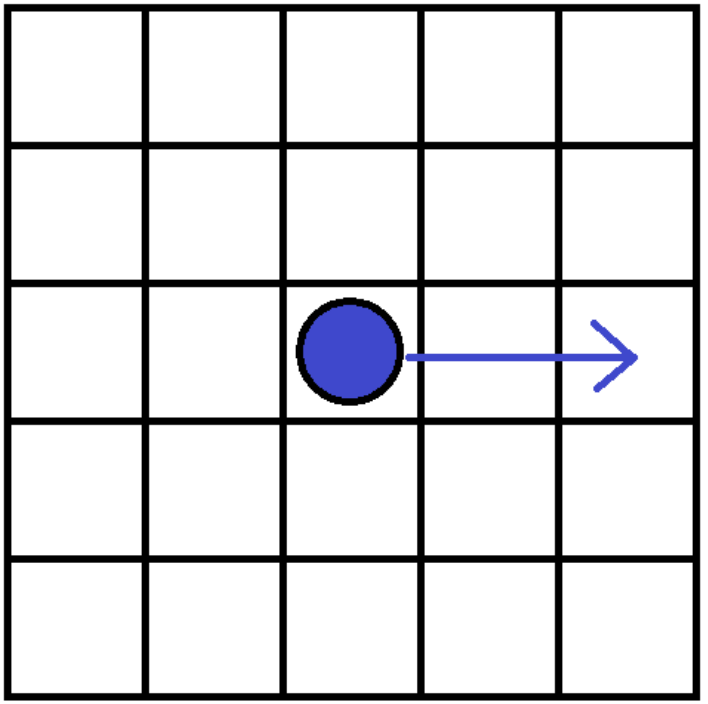
(1,2)



(-2,1)



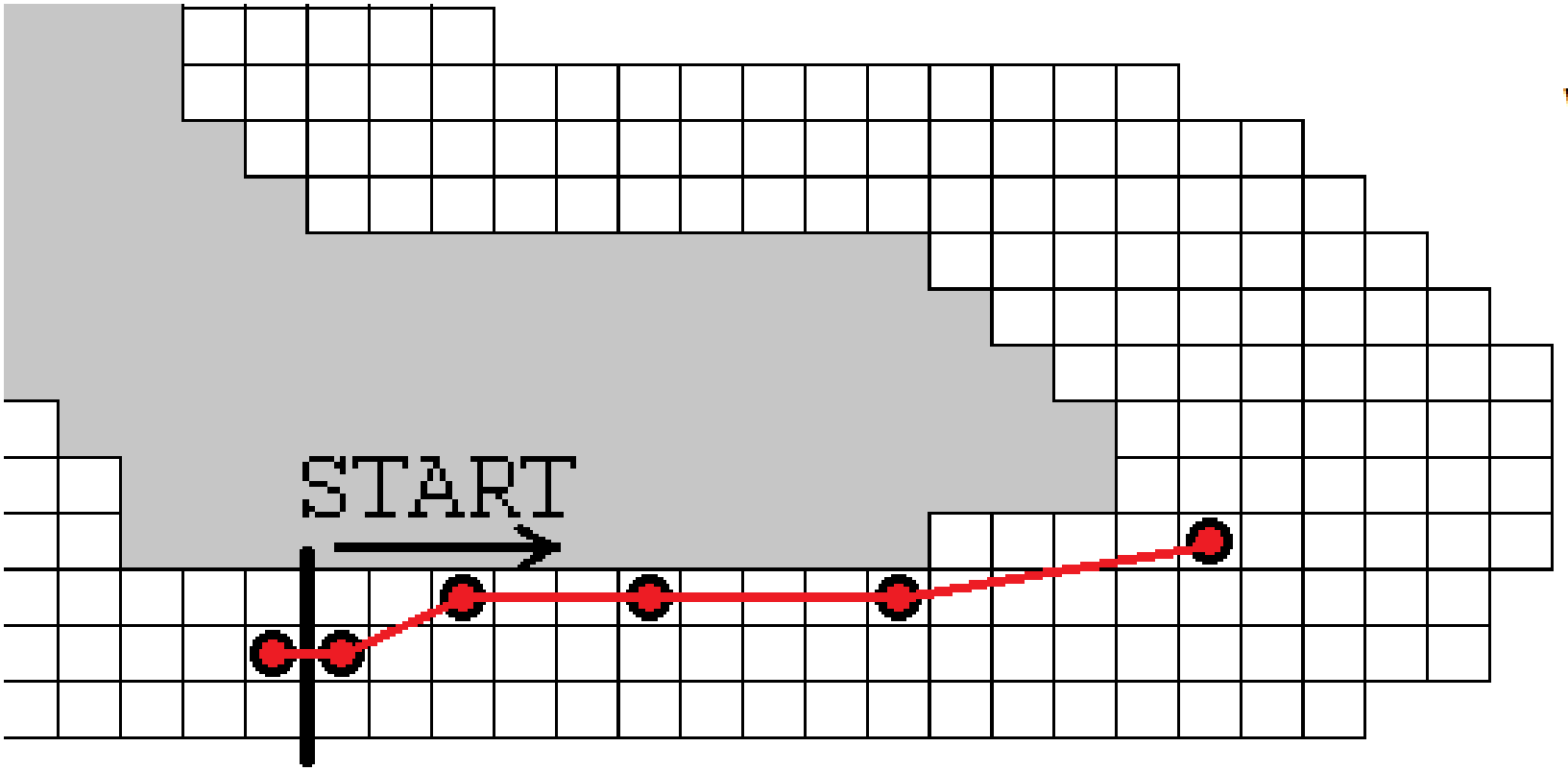
(0,-1)



(2,0)

On your turn, you can change each component of your velocity by adding one, subtracting one or keeping it the same *(you can make different choices for each component of your velocity).* Then move with your new velocity.

On your turn, you can change each component of your velocity by adding one, subtracting one or keeping it the same *(you can make different choices for each component of your velocity).* Then move with your new velocity.




Velocity

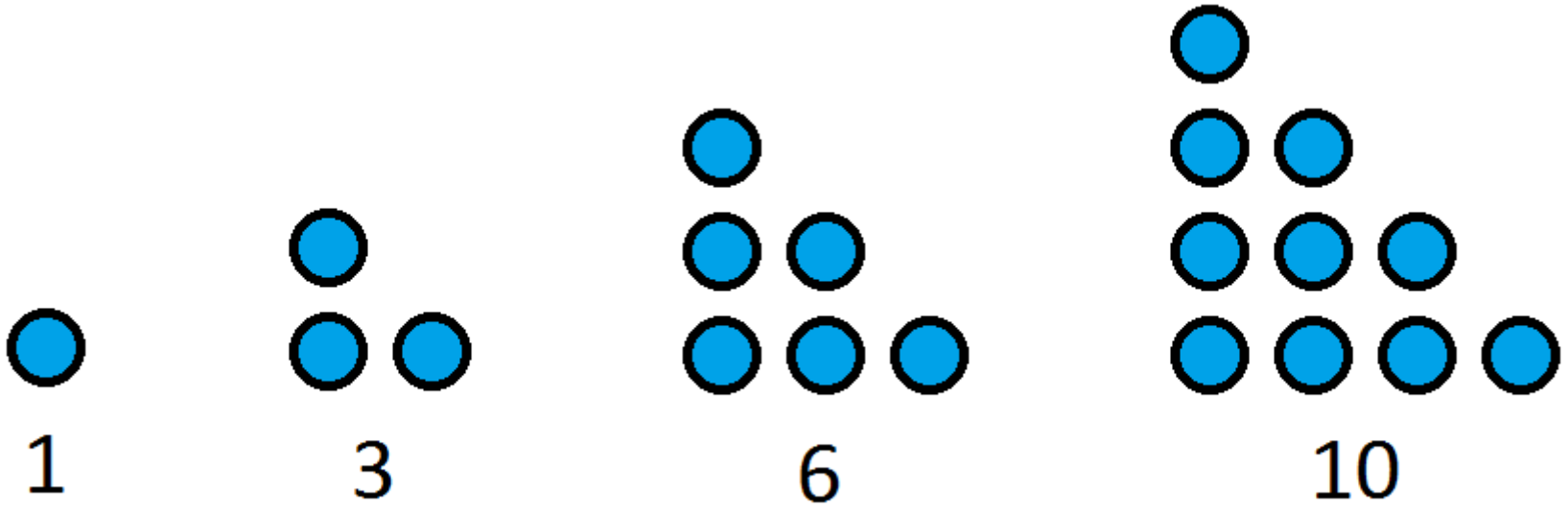
(1,0)

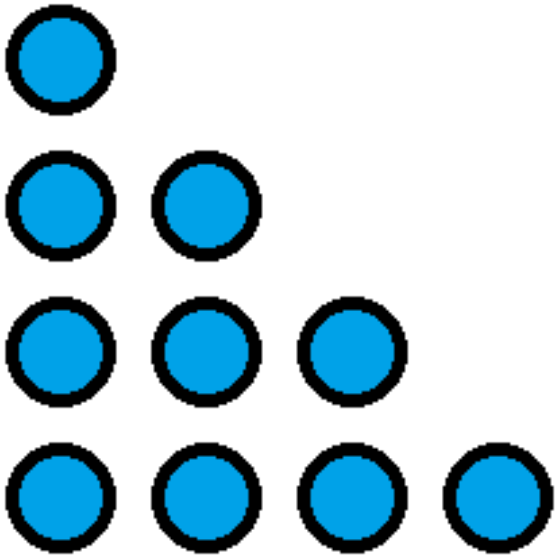
(2,1)

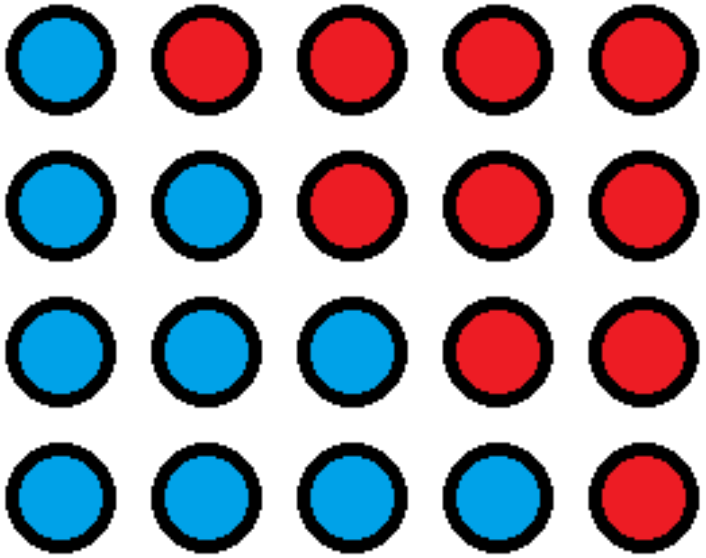
(3,0)

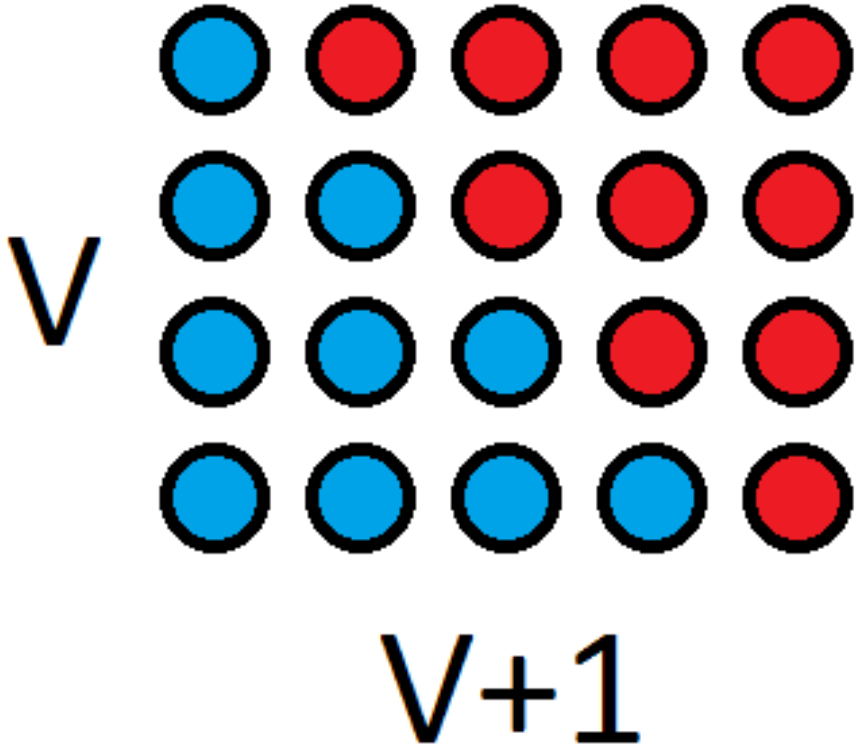
(4,0)

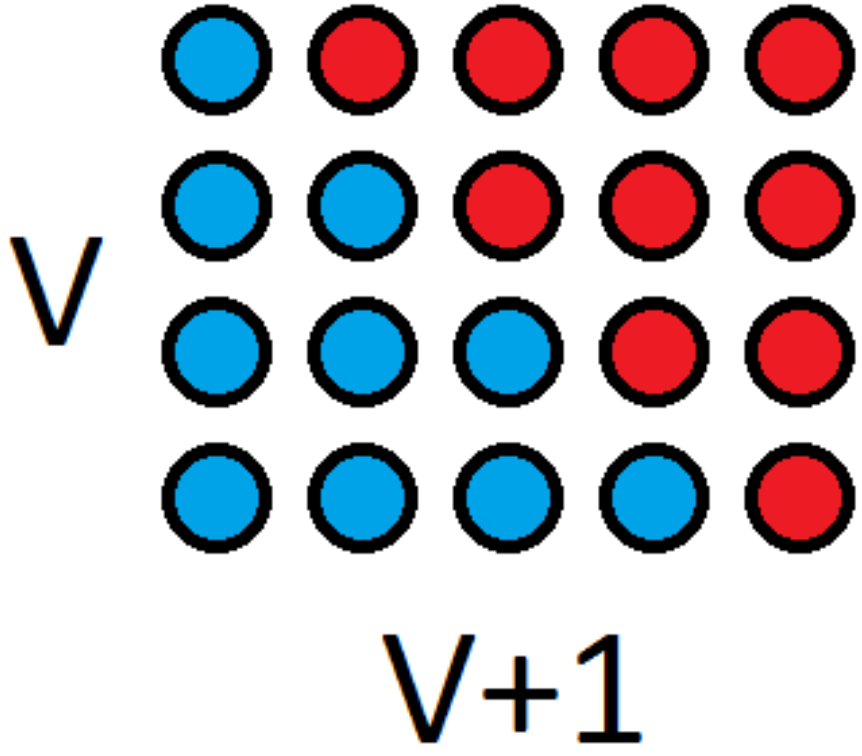
(5,1)


1
3
6
10

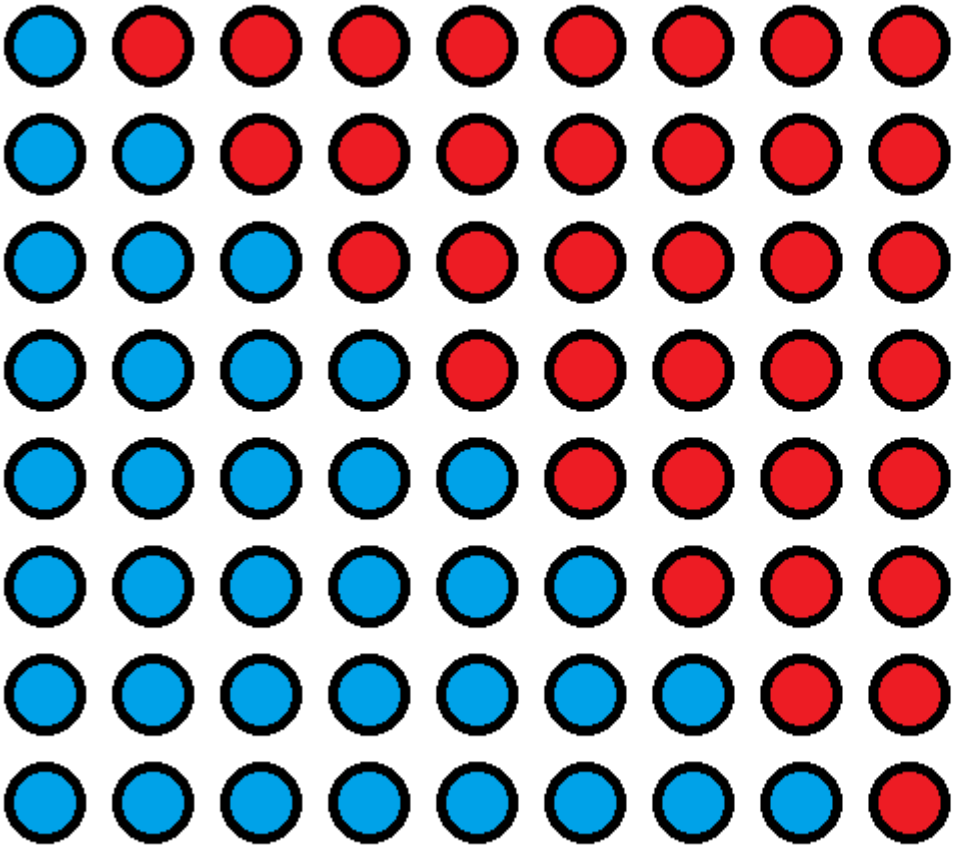





V
V+1

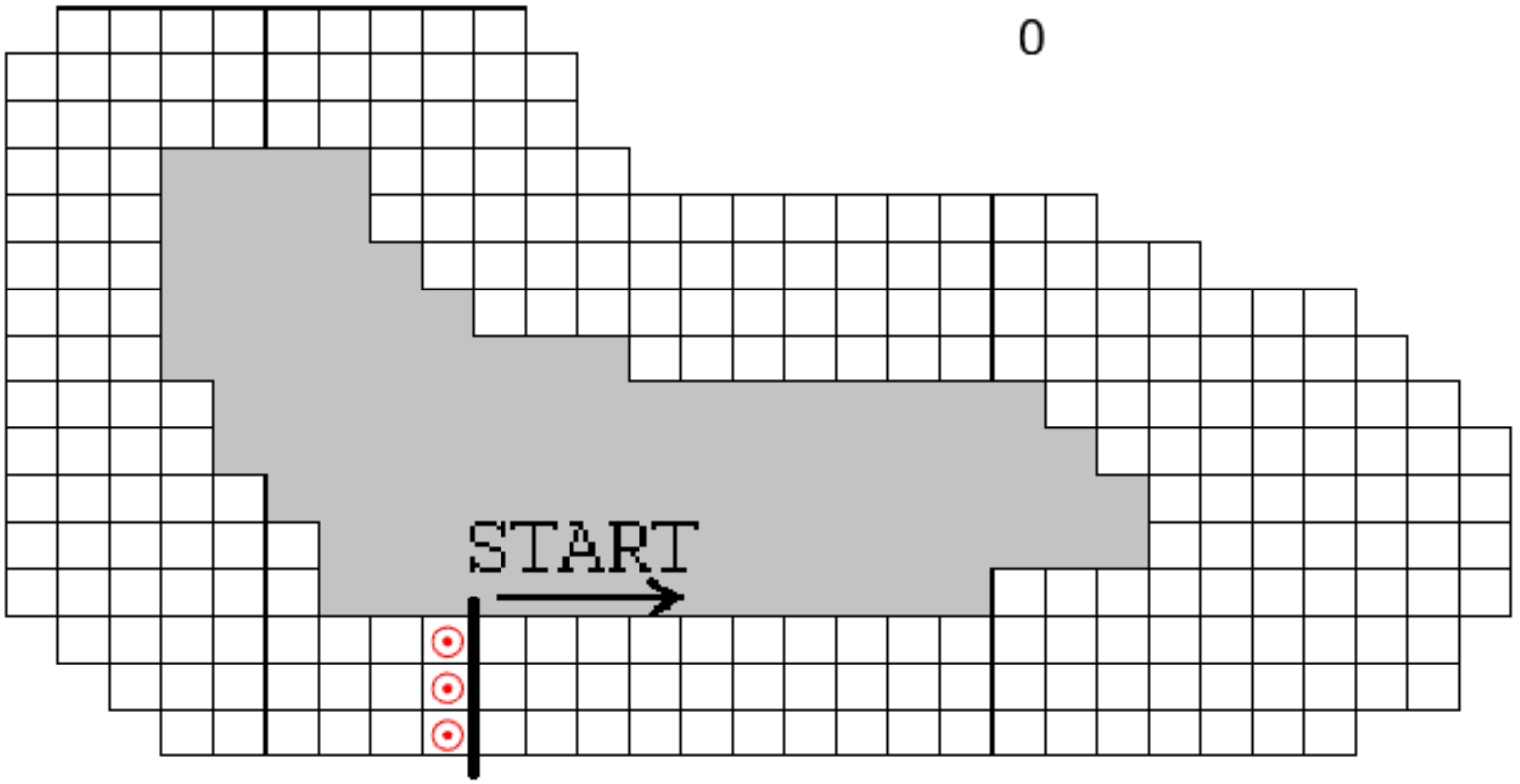


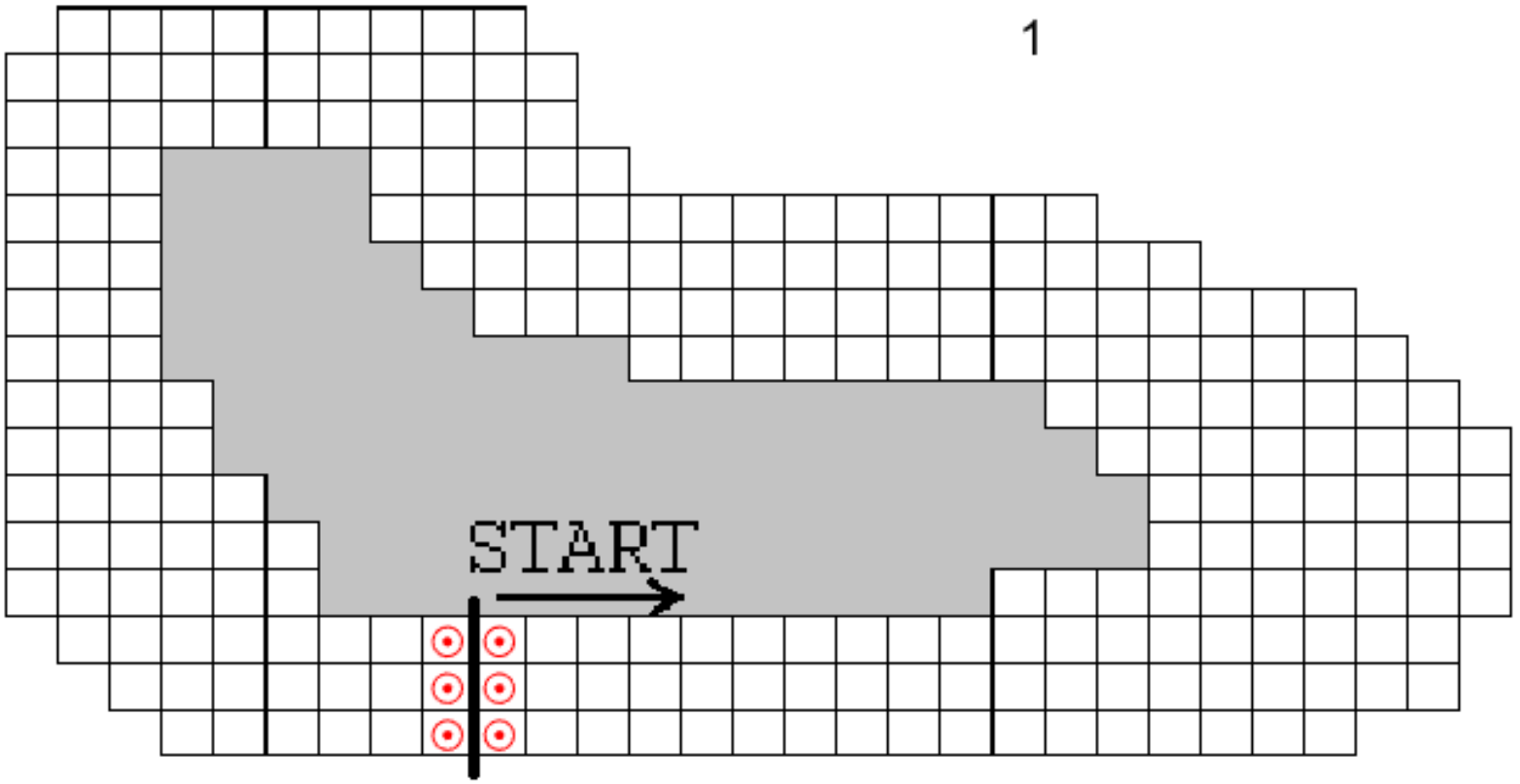

$V \times (V+1) \div 2$

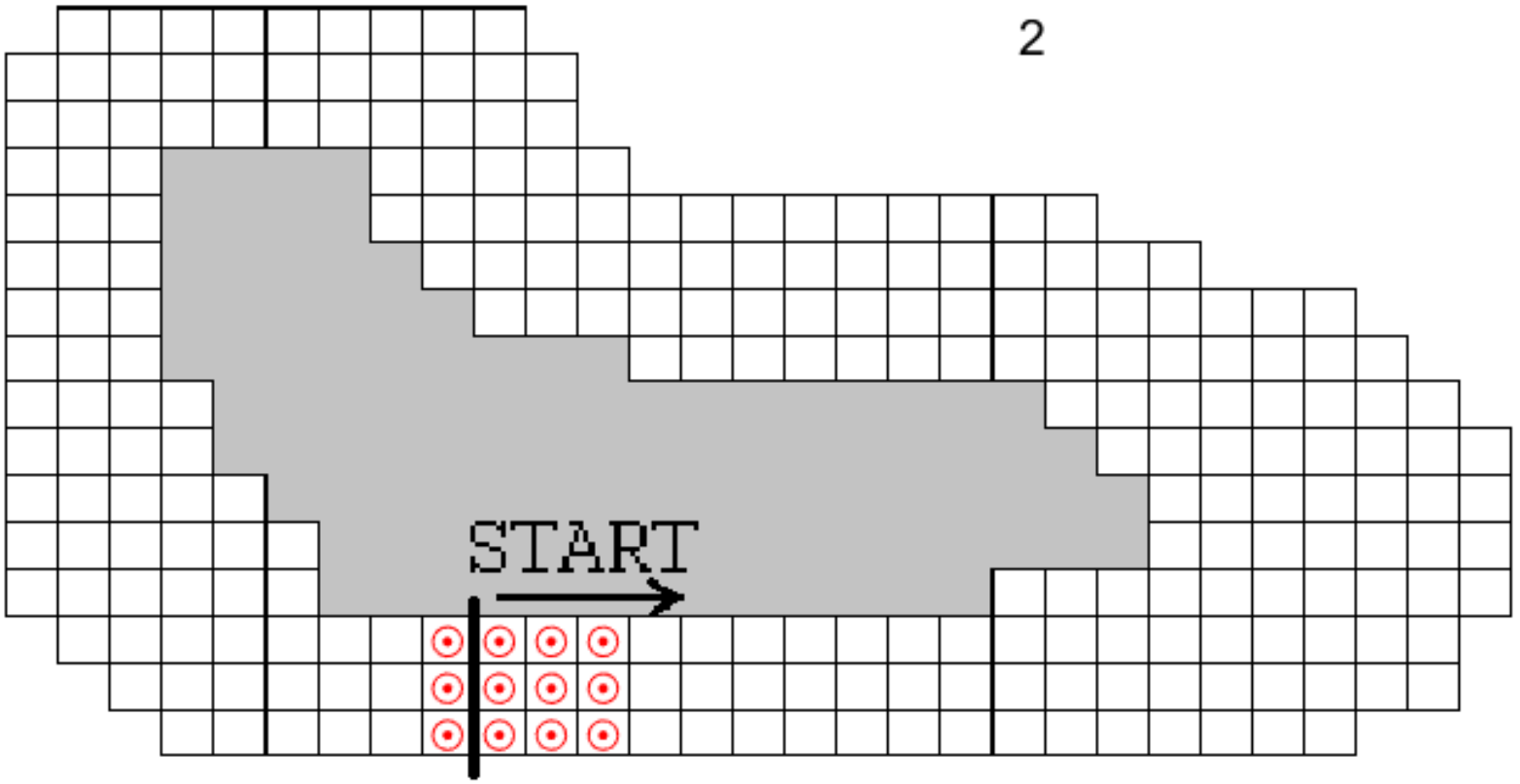


$8 \times 9 \div 2 = 36$

What’s the fastest possible lap?


0
START


1
START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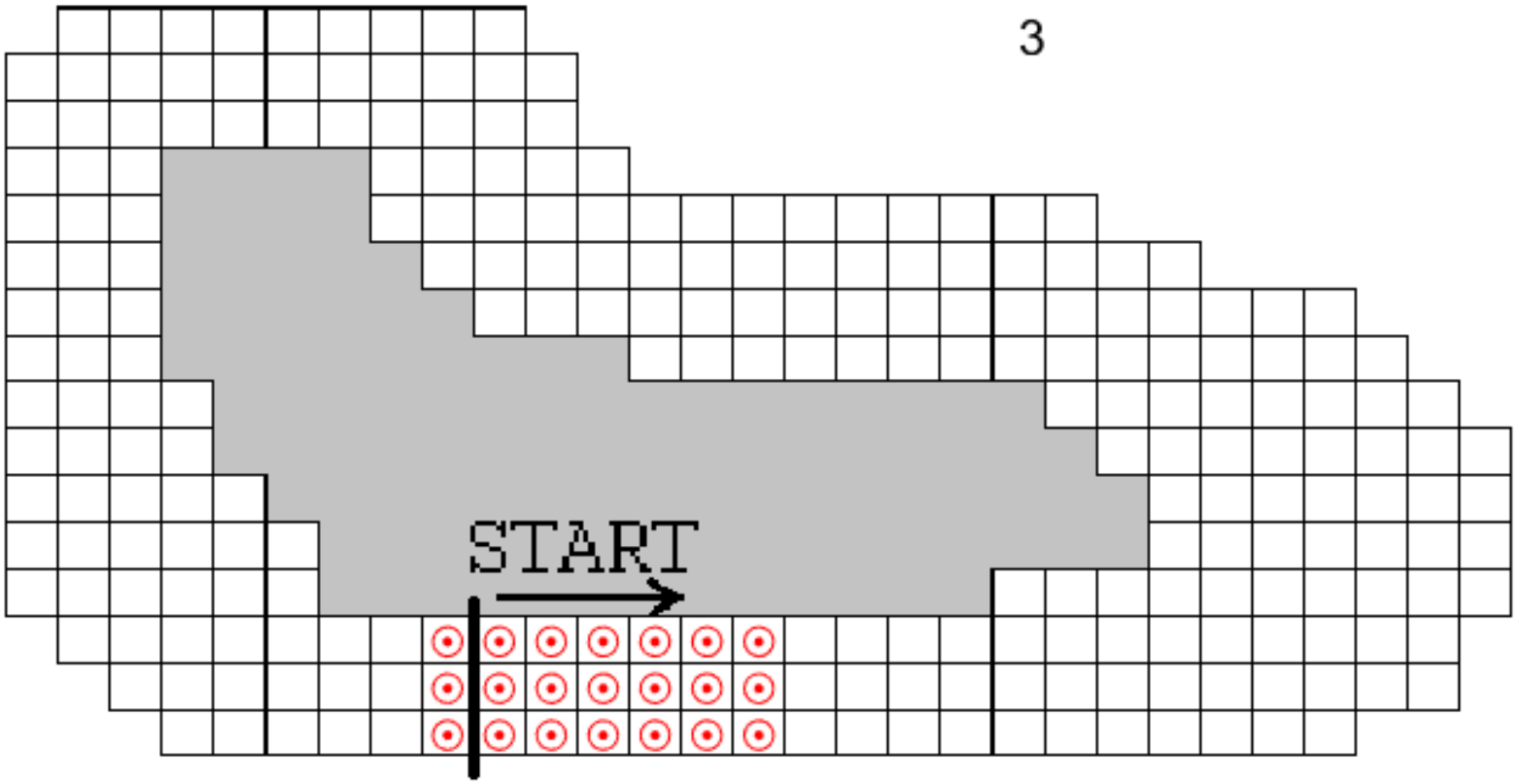
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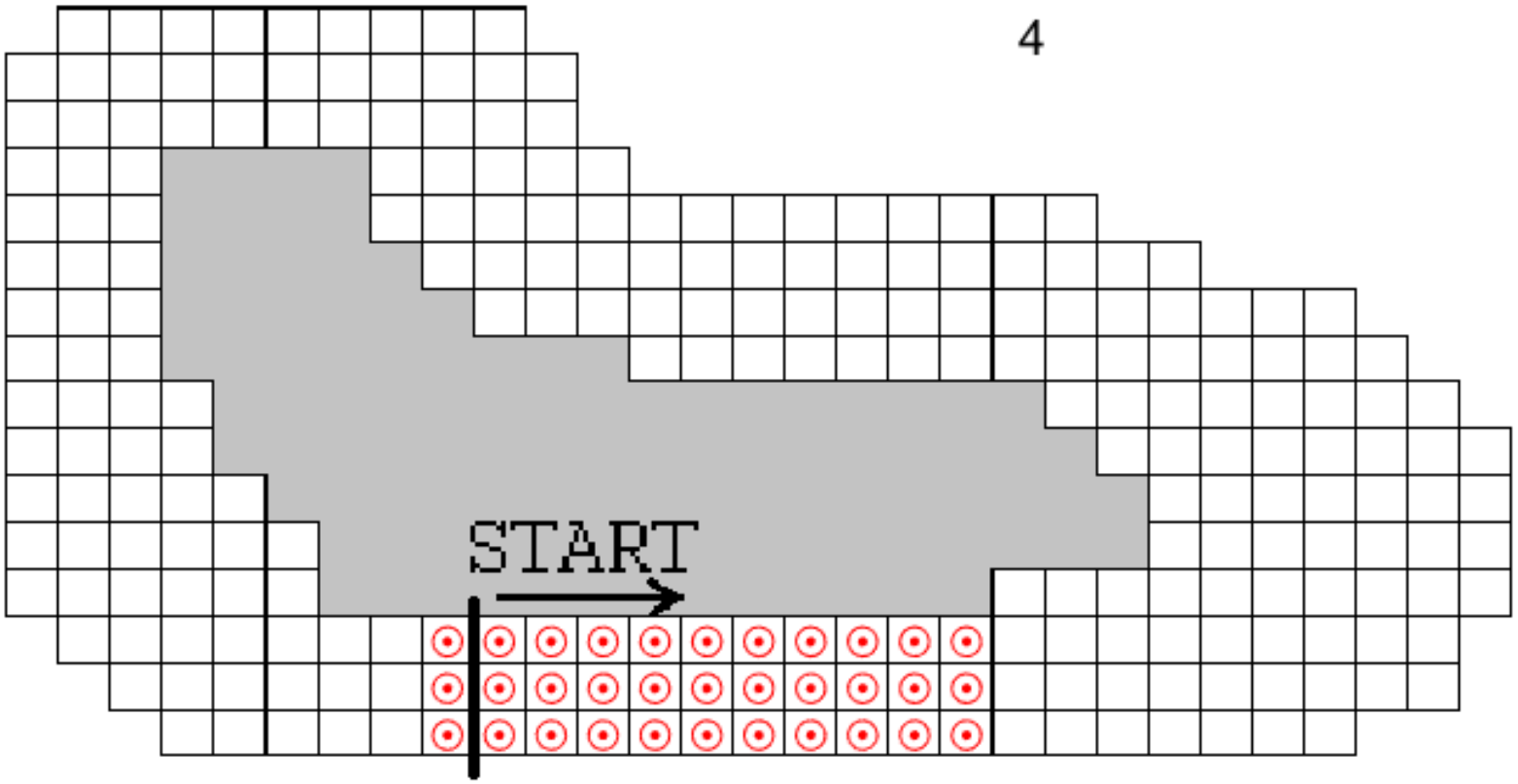
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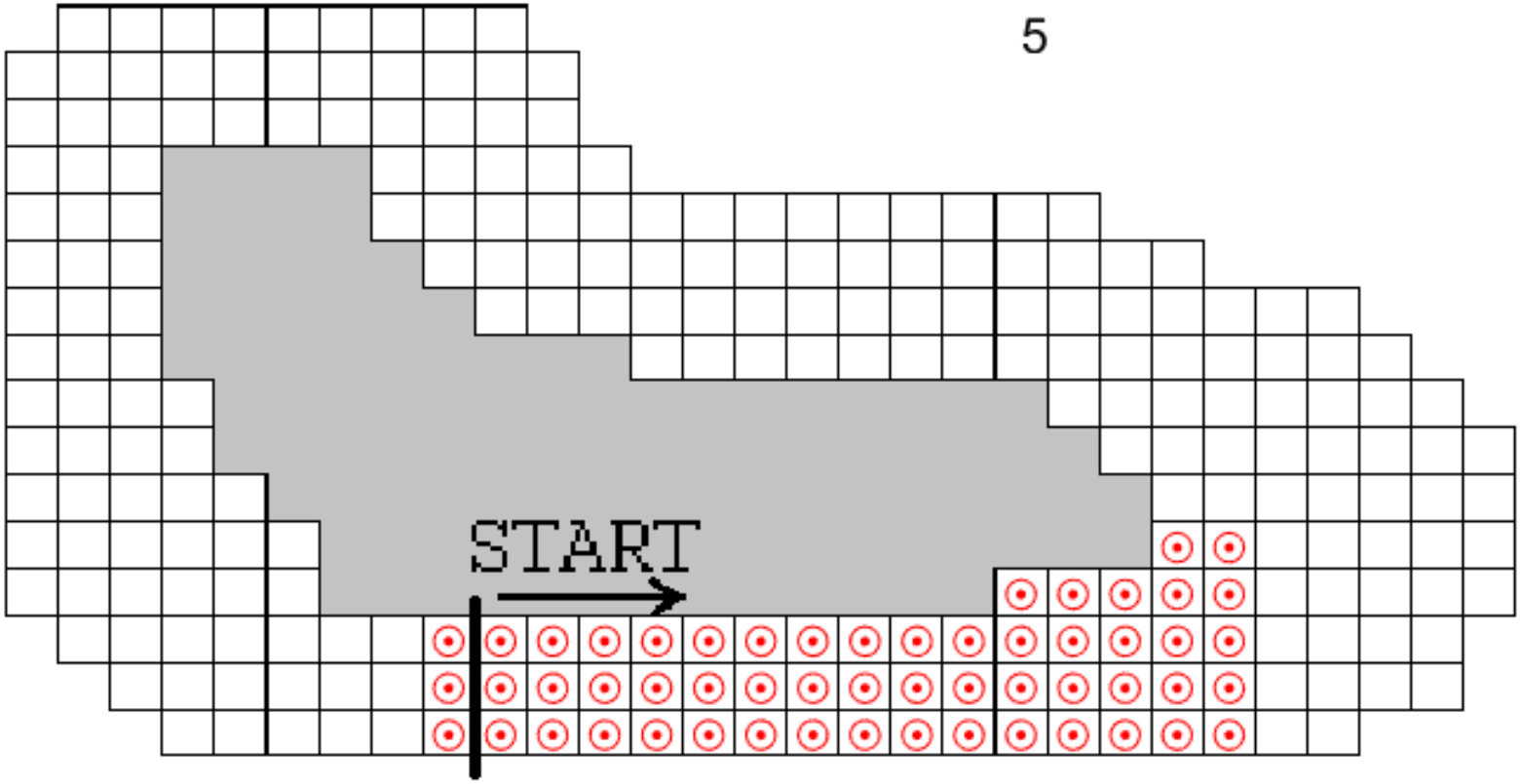
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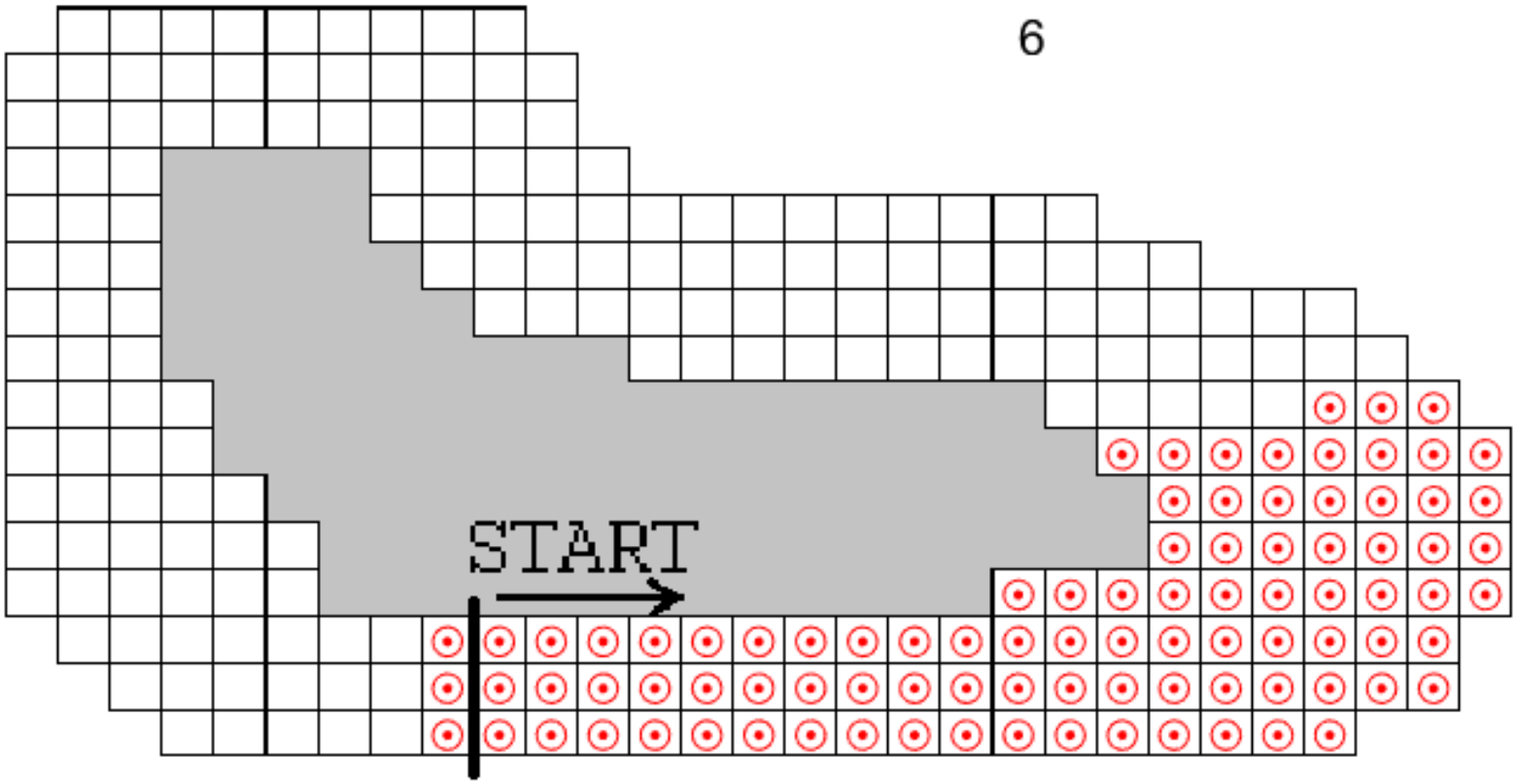
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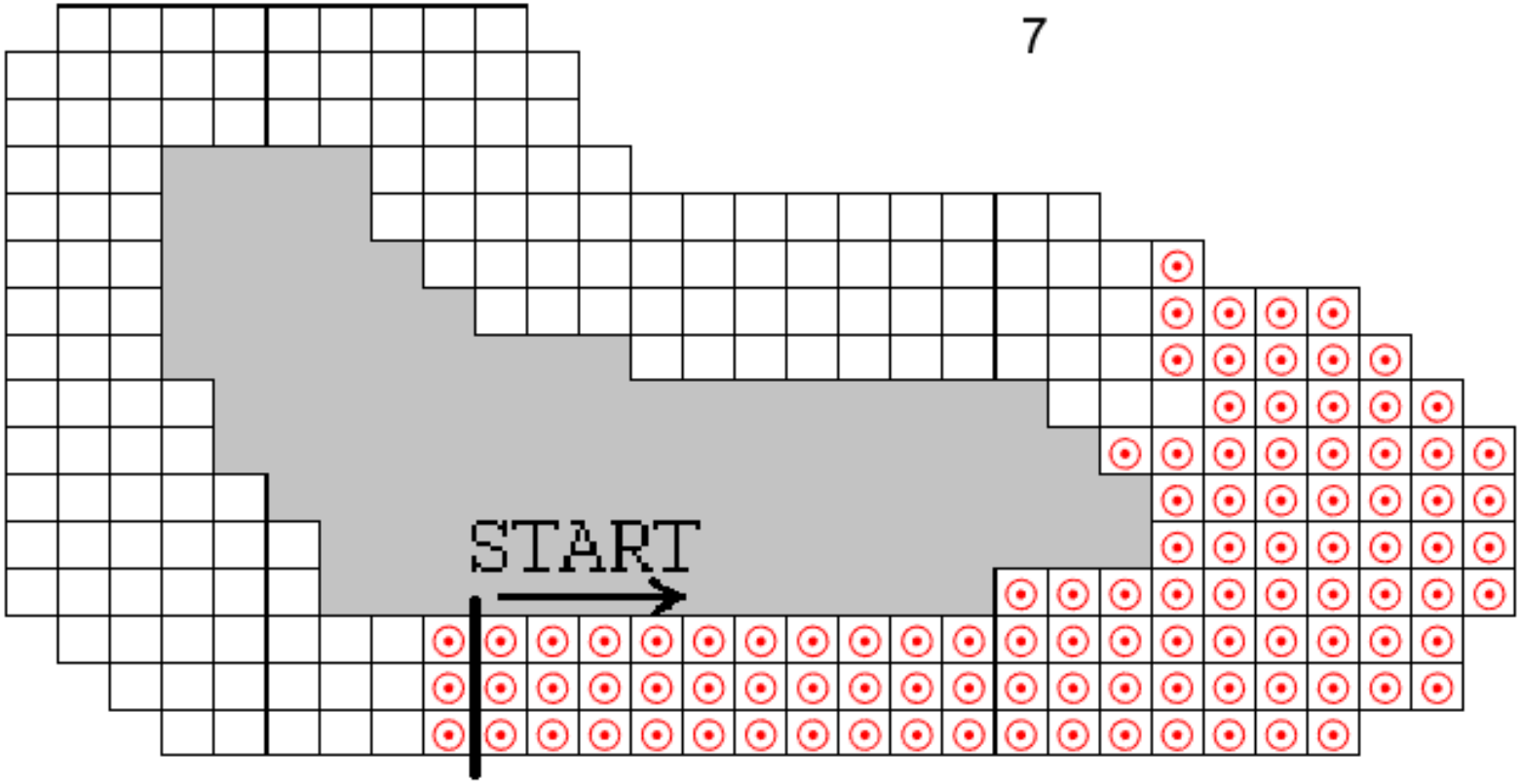
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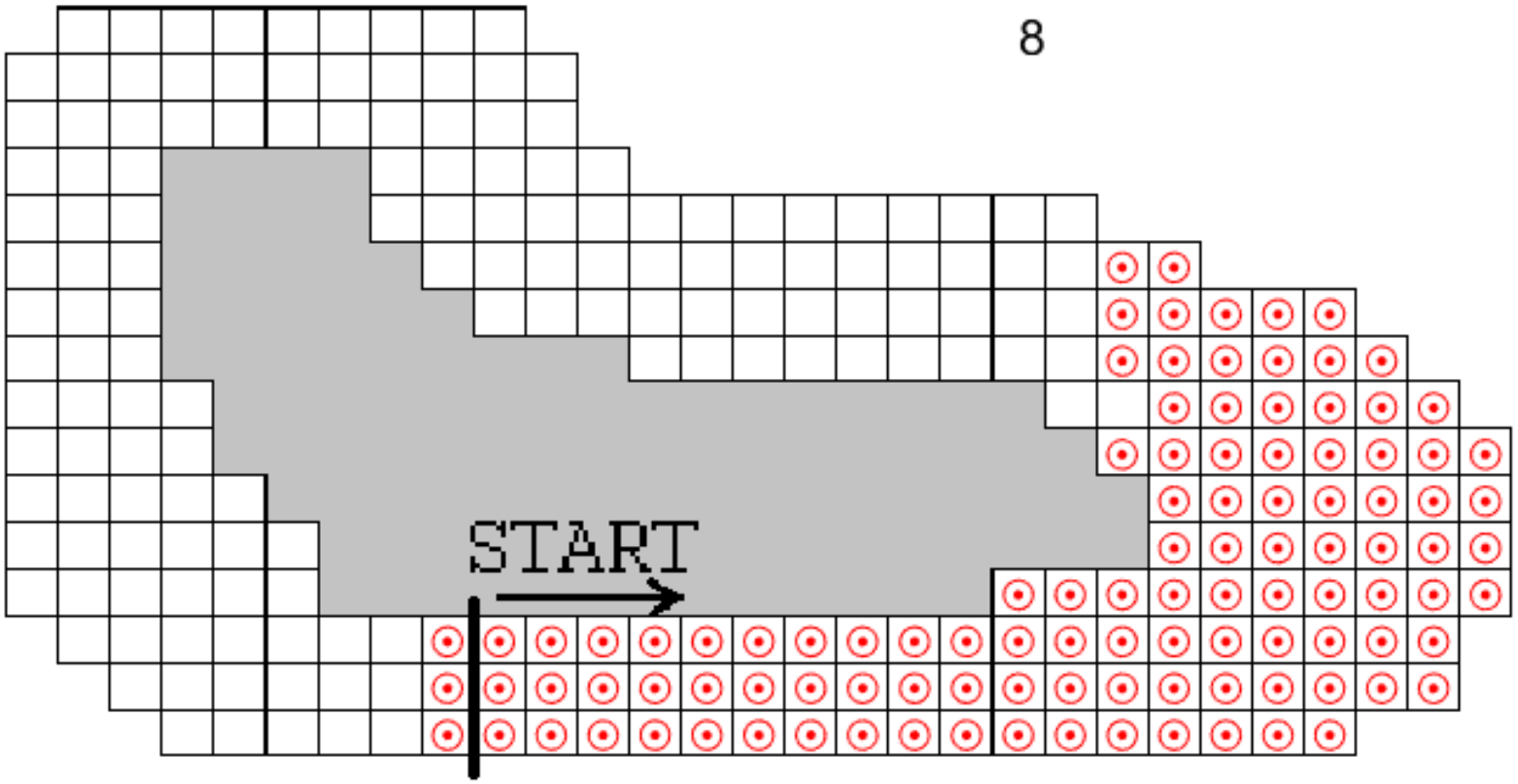
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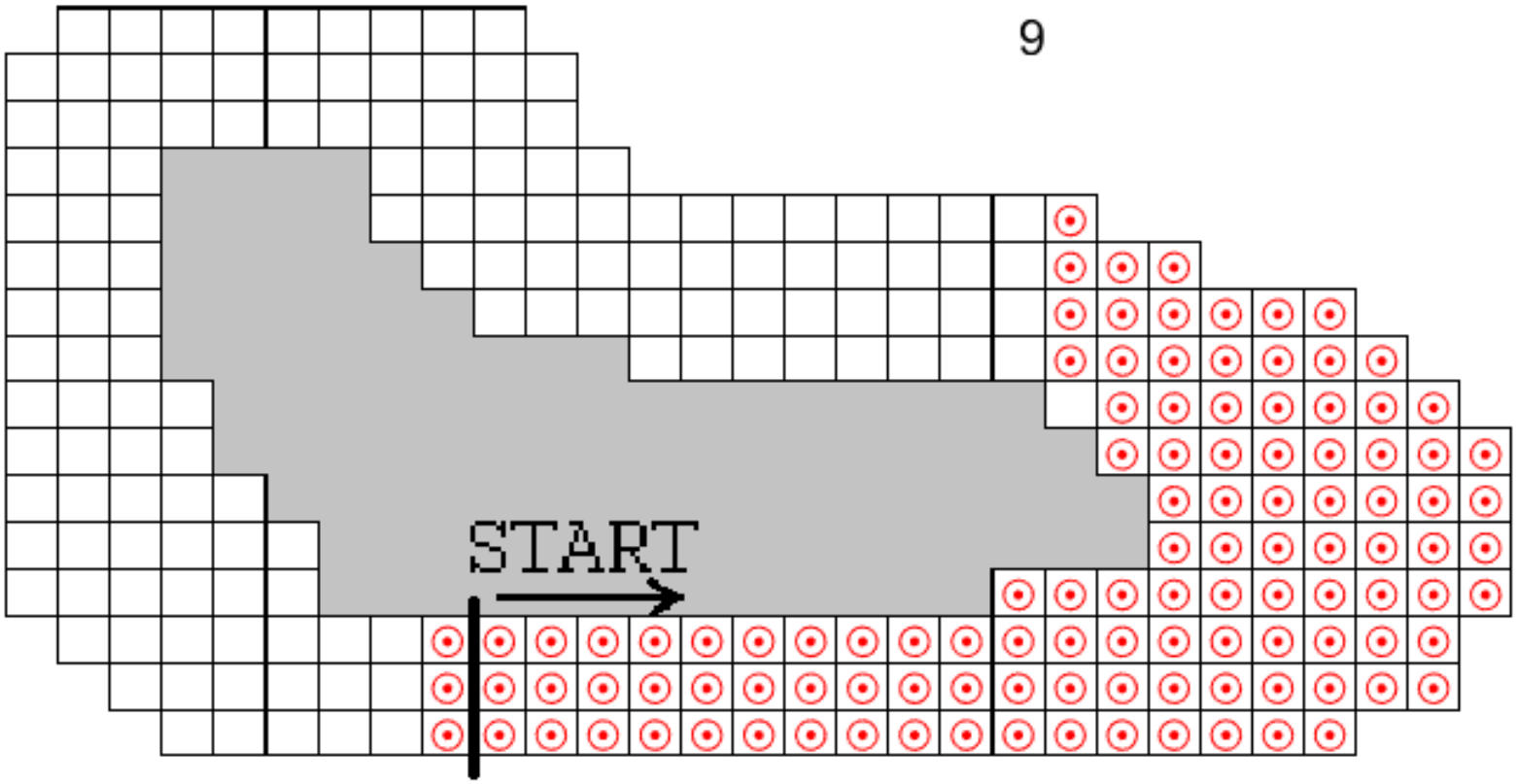
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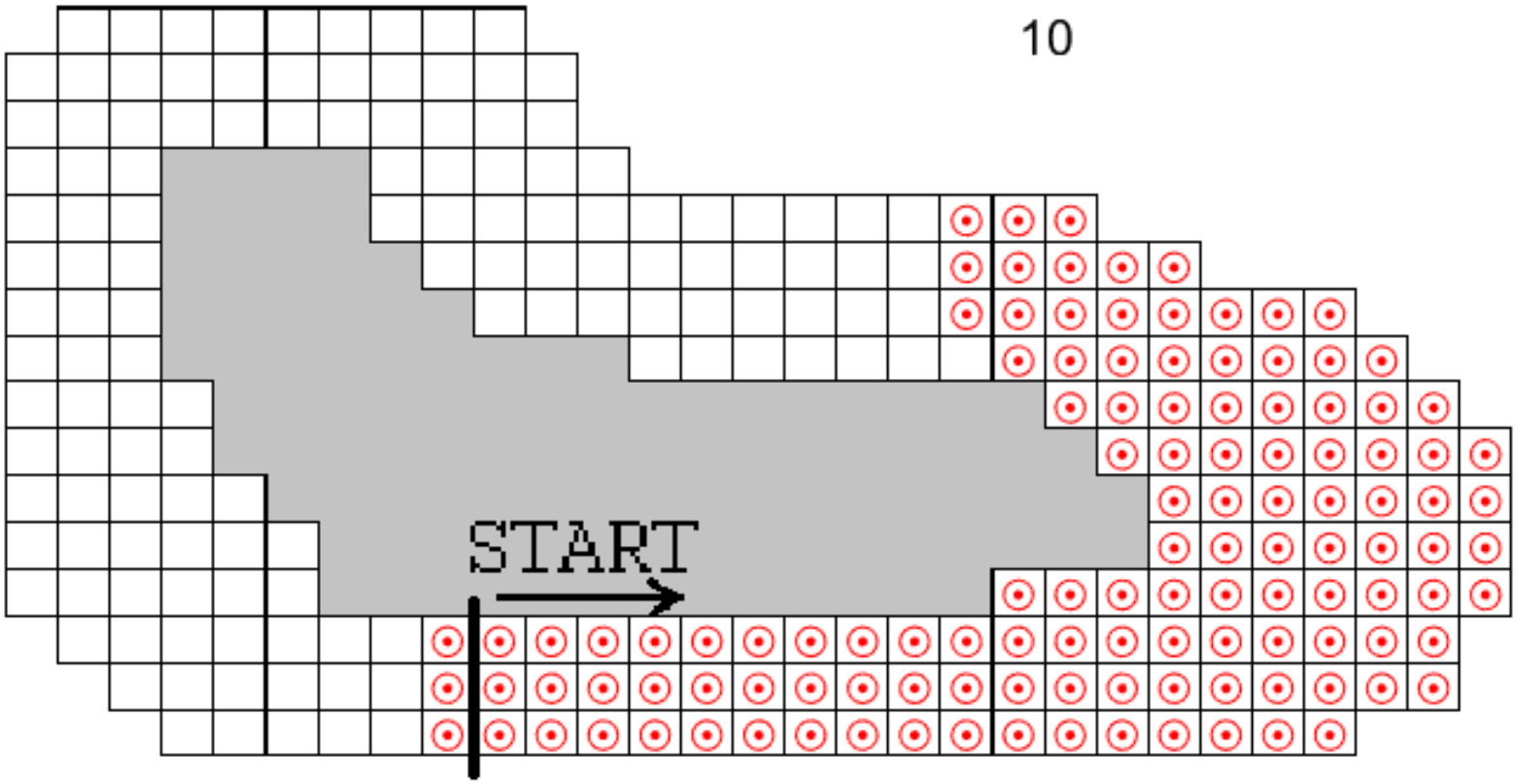
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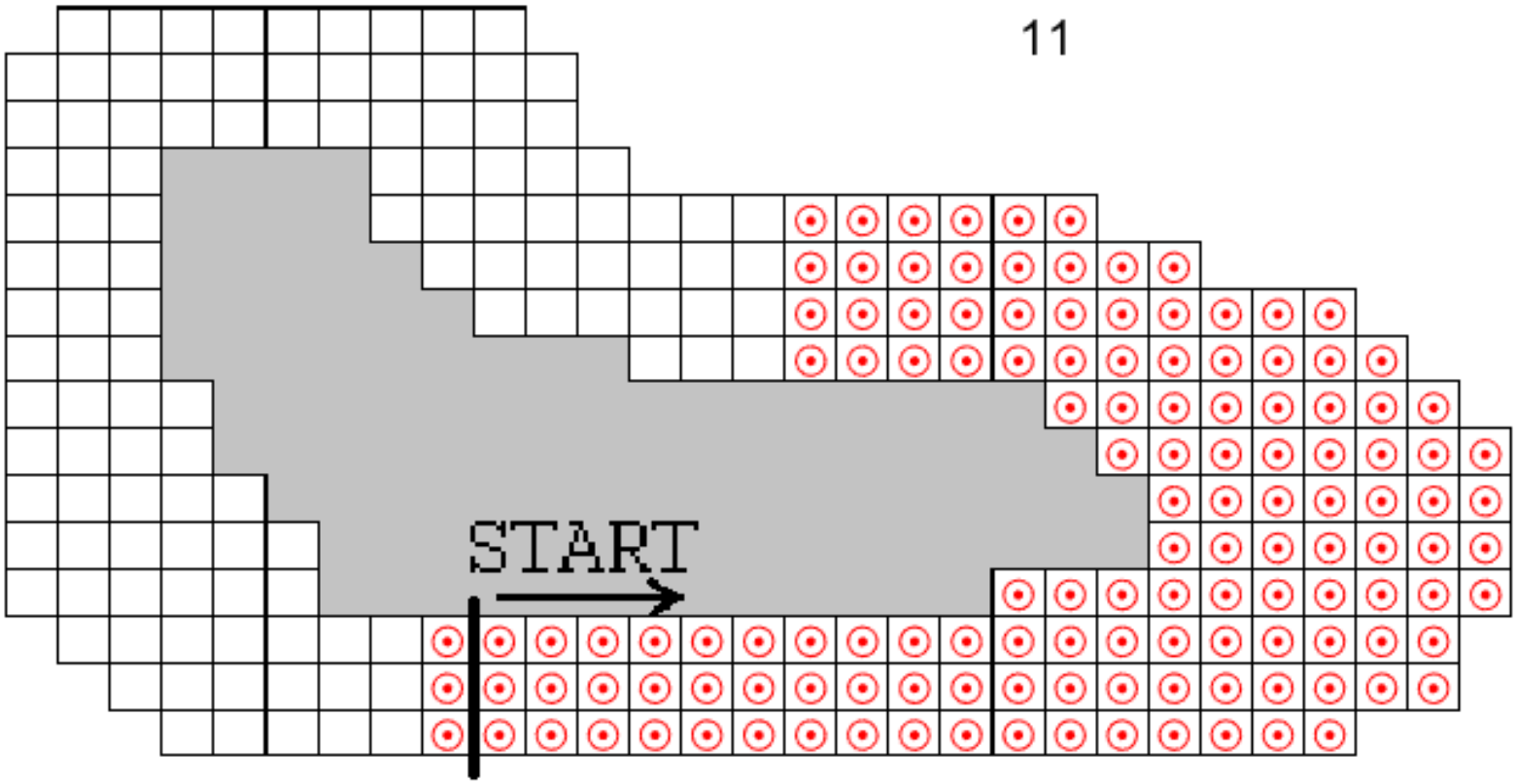
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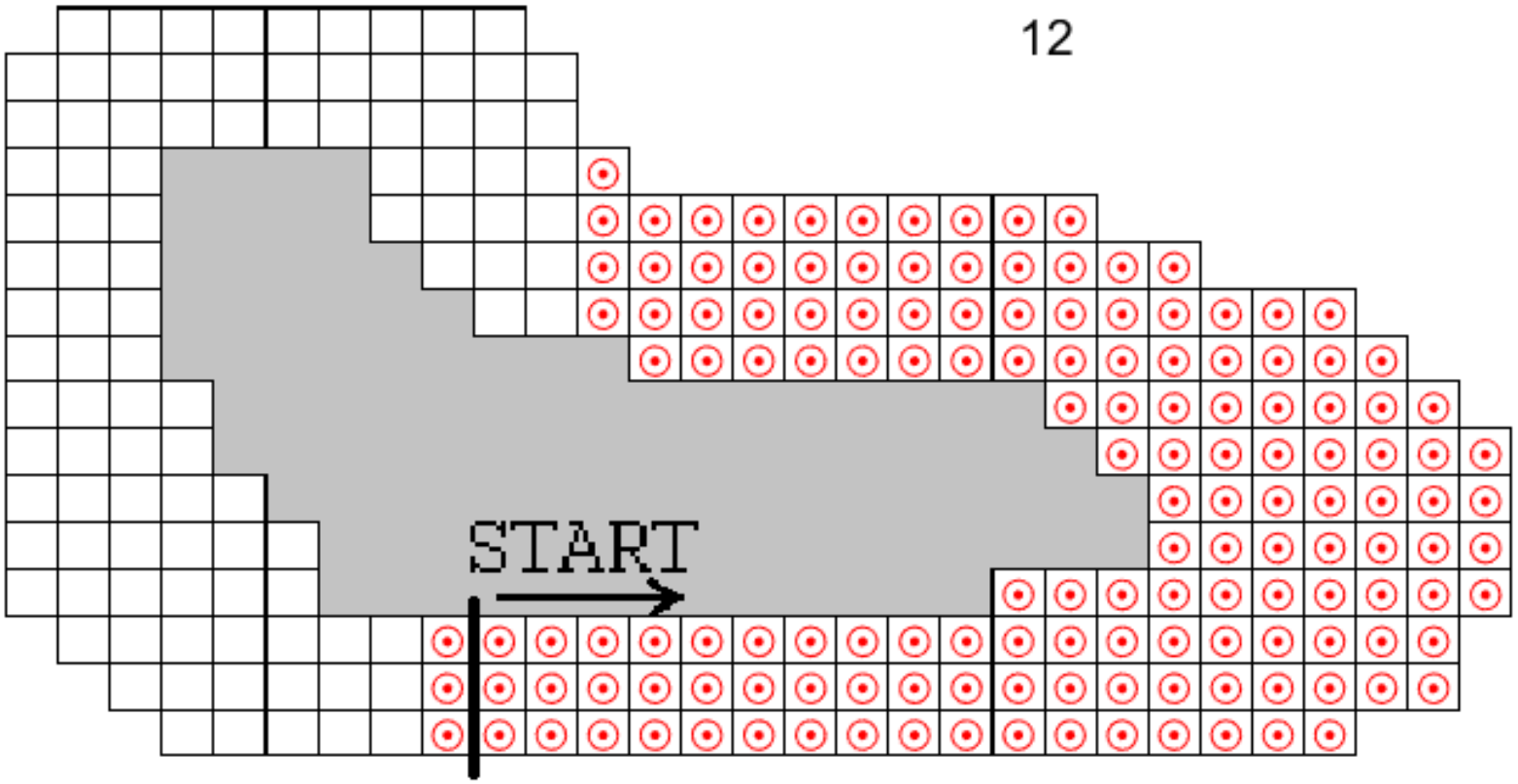
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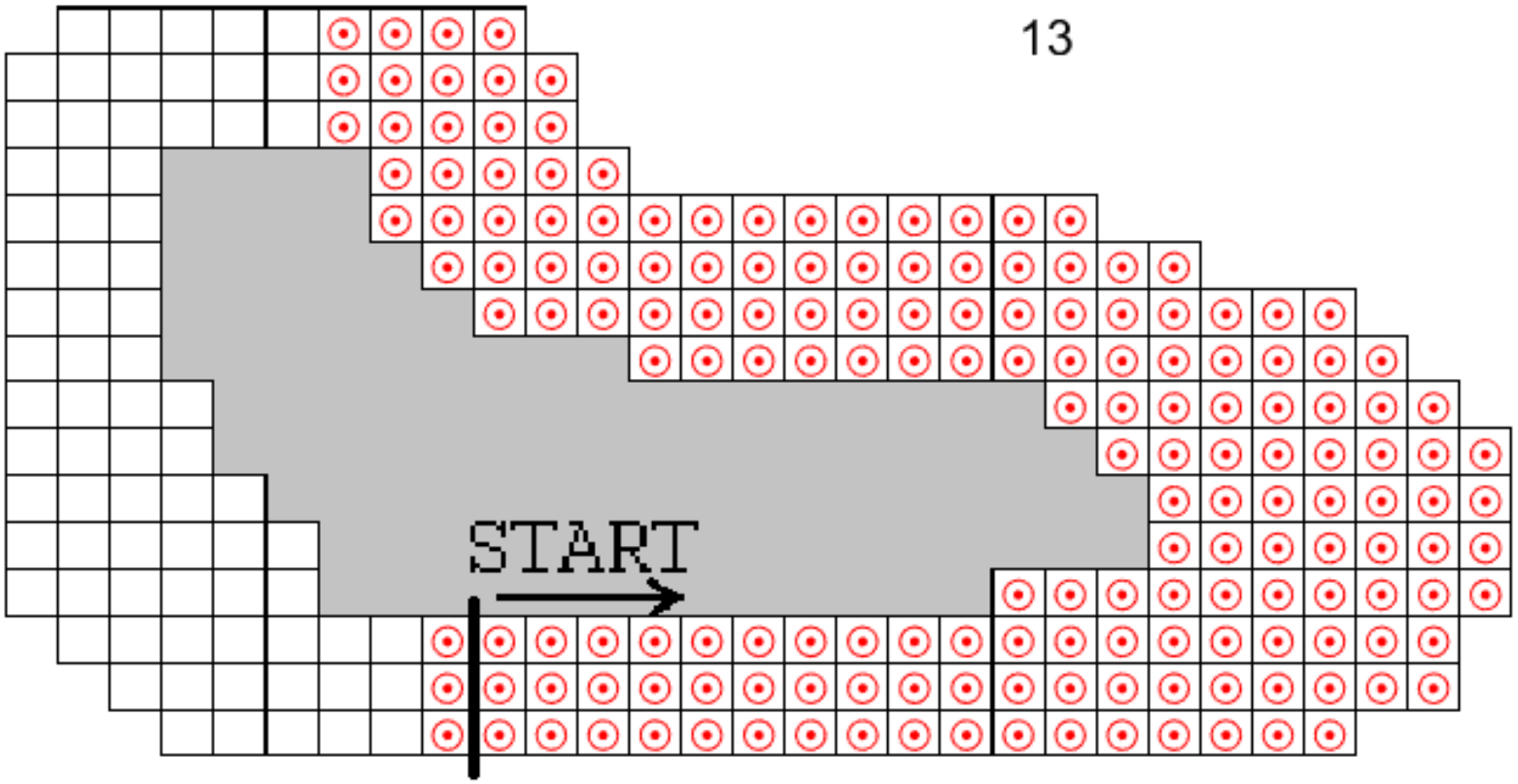
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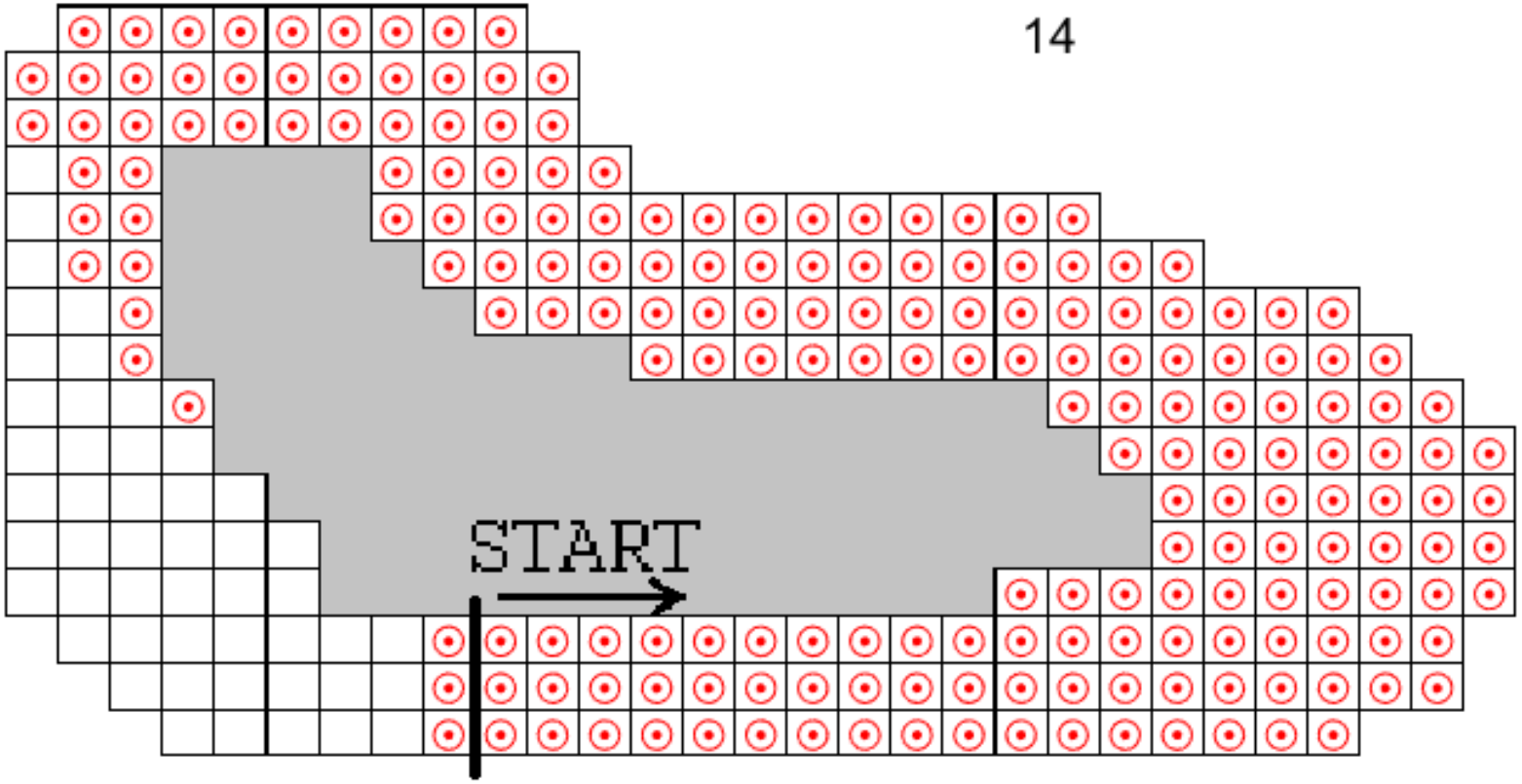
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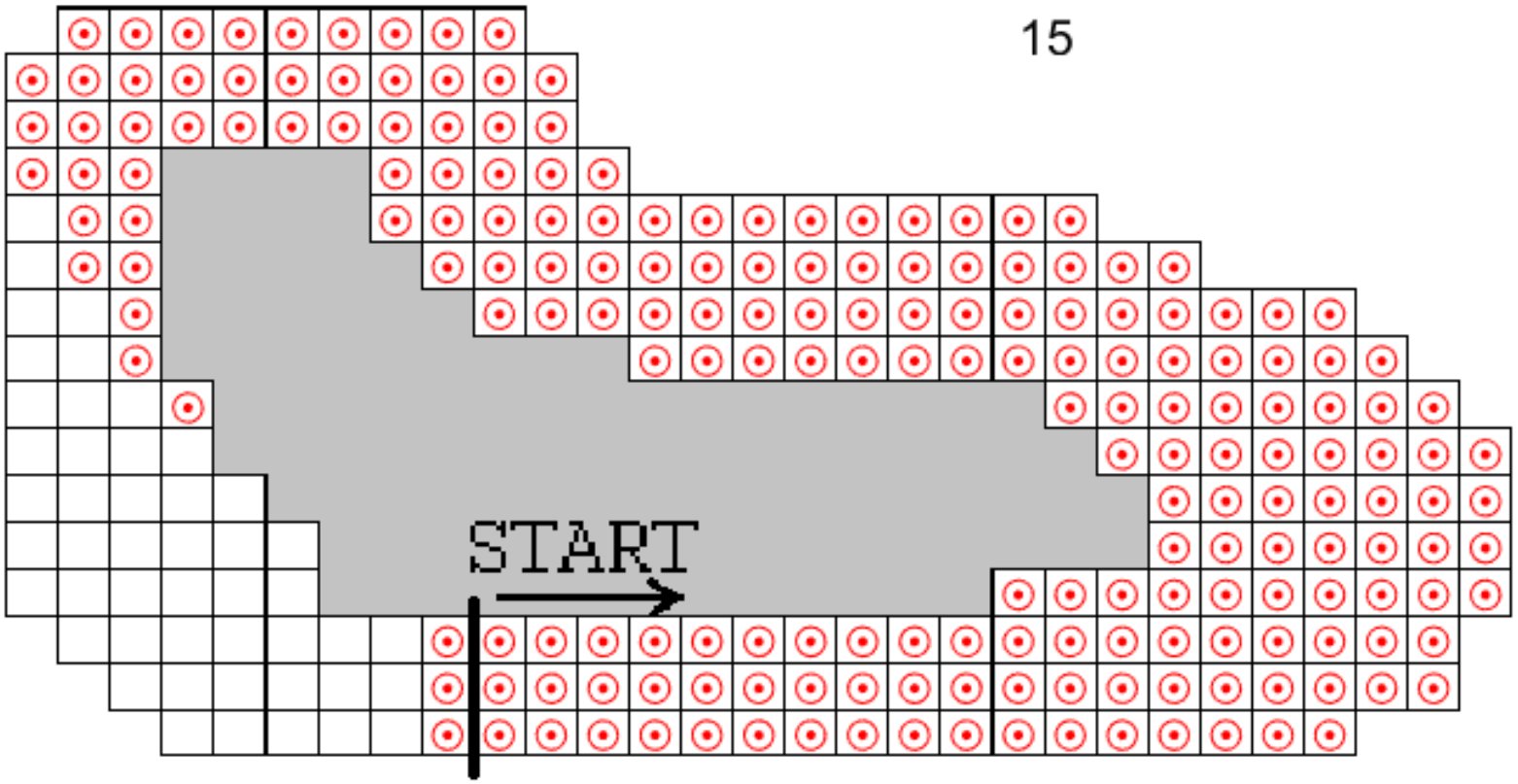
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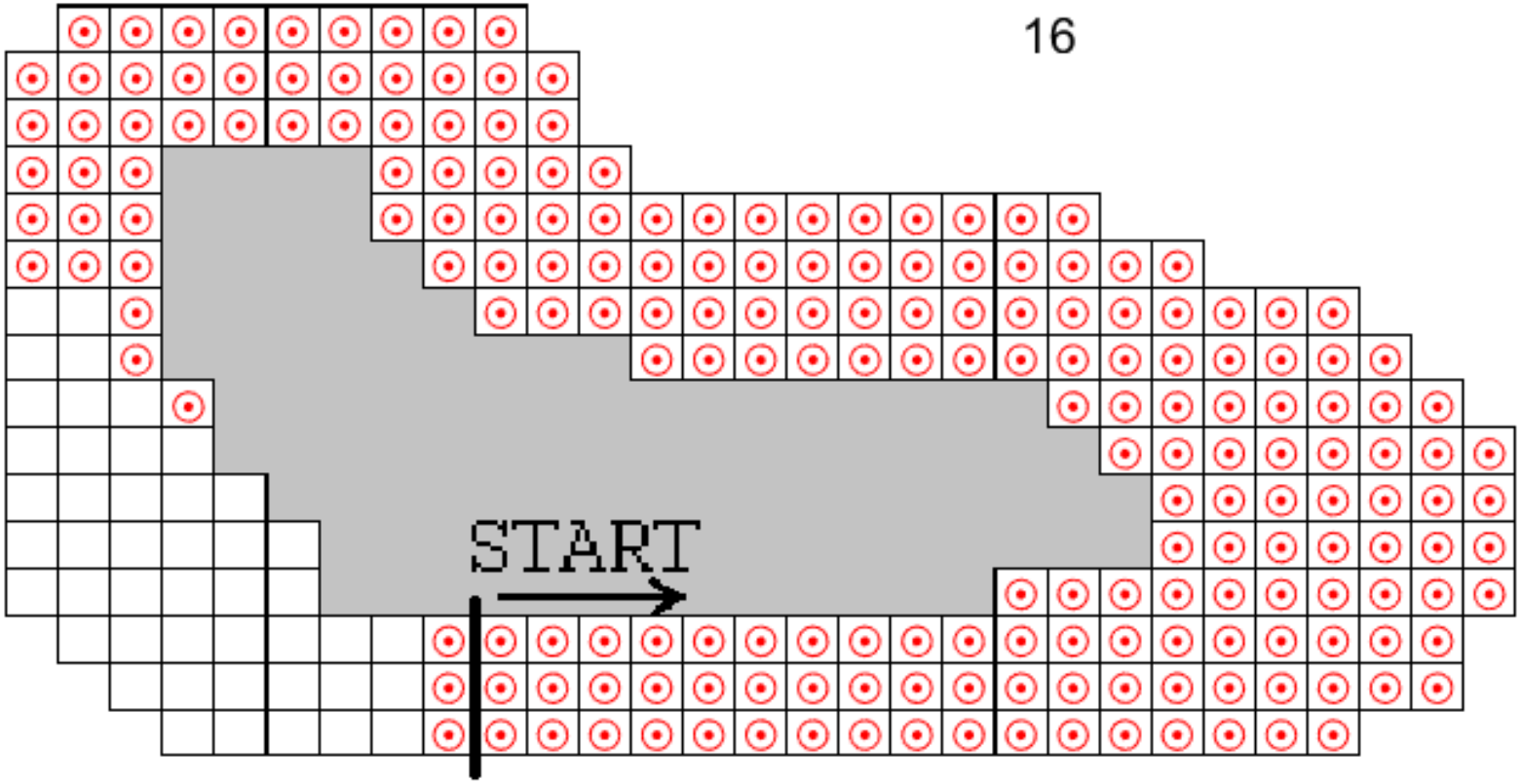
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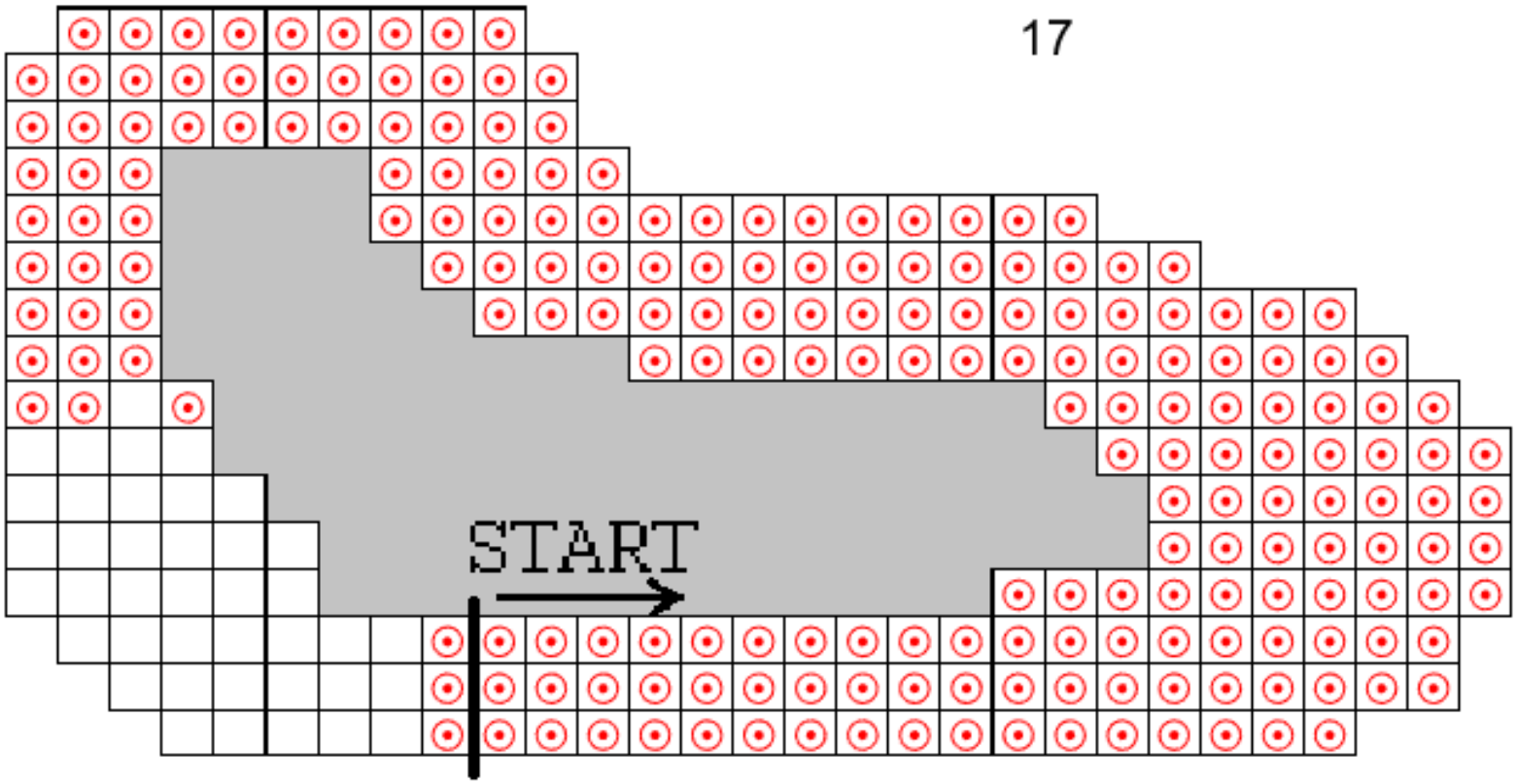
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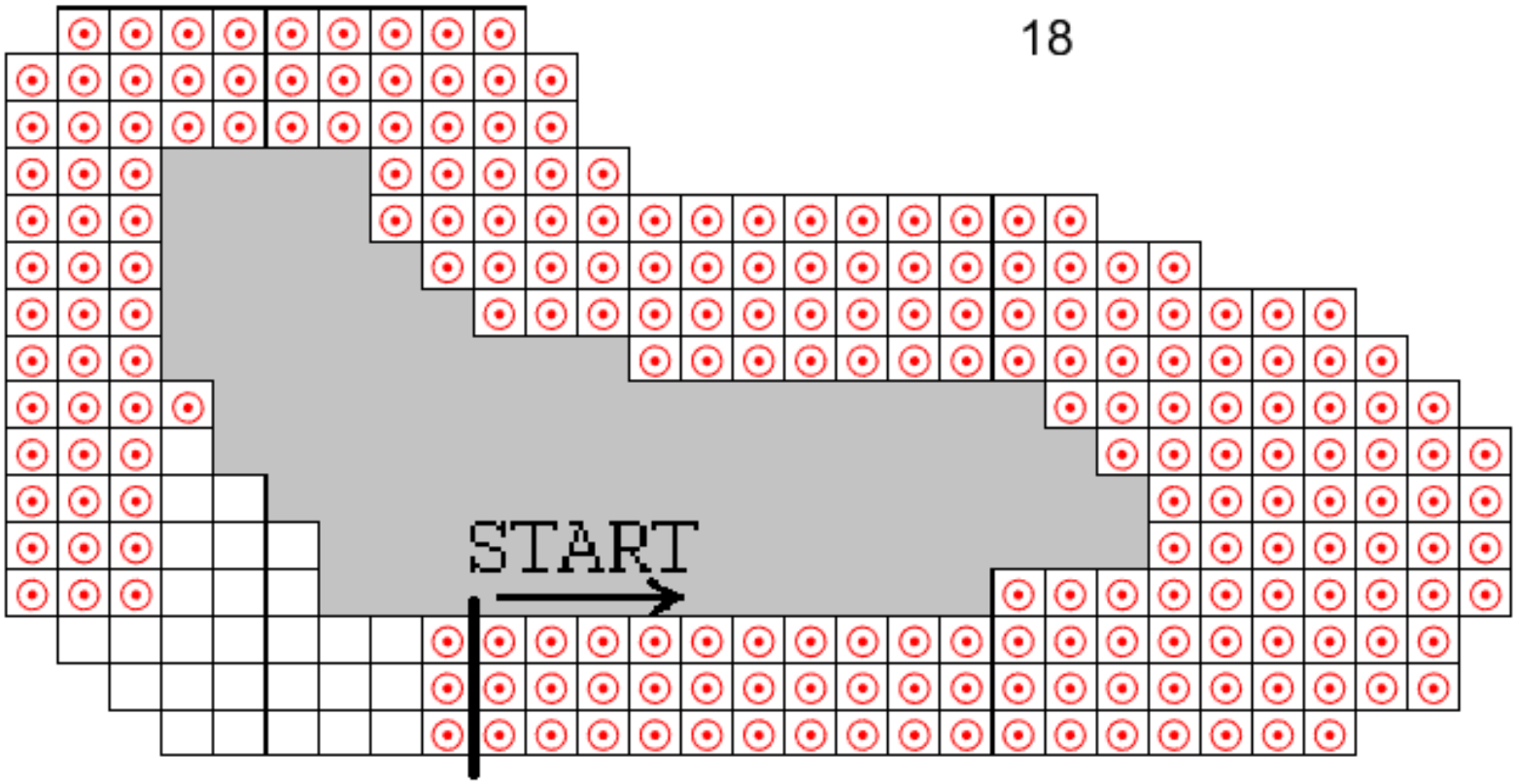
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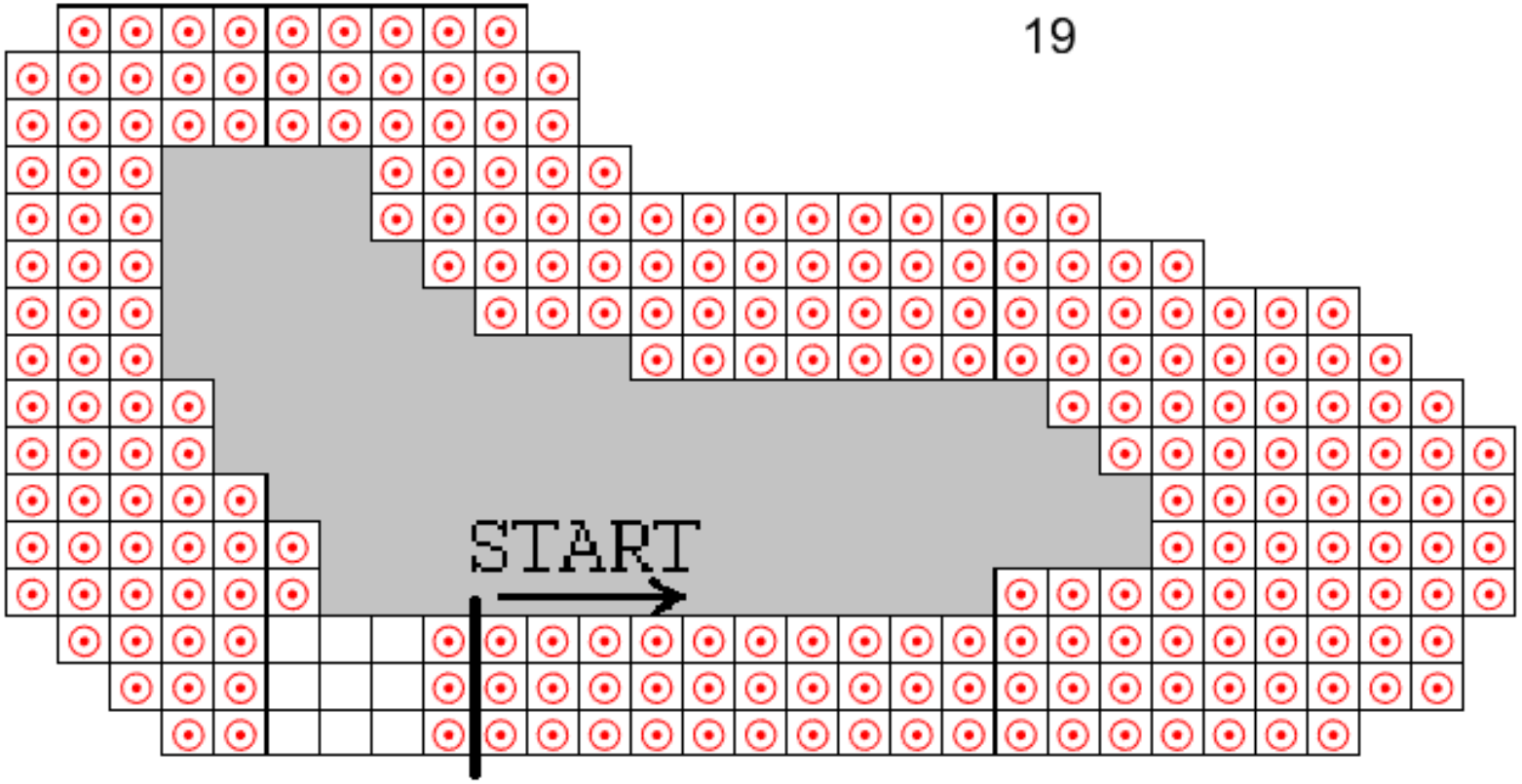
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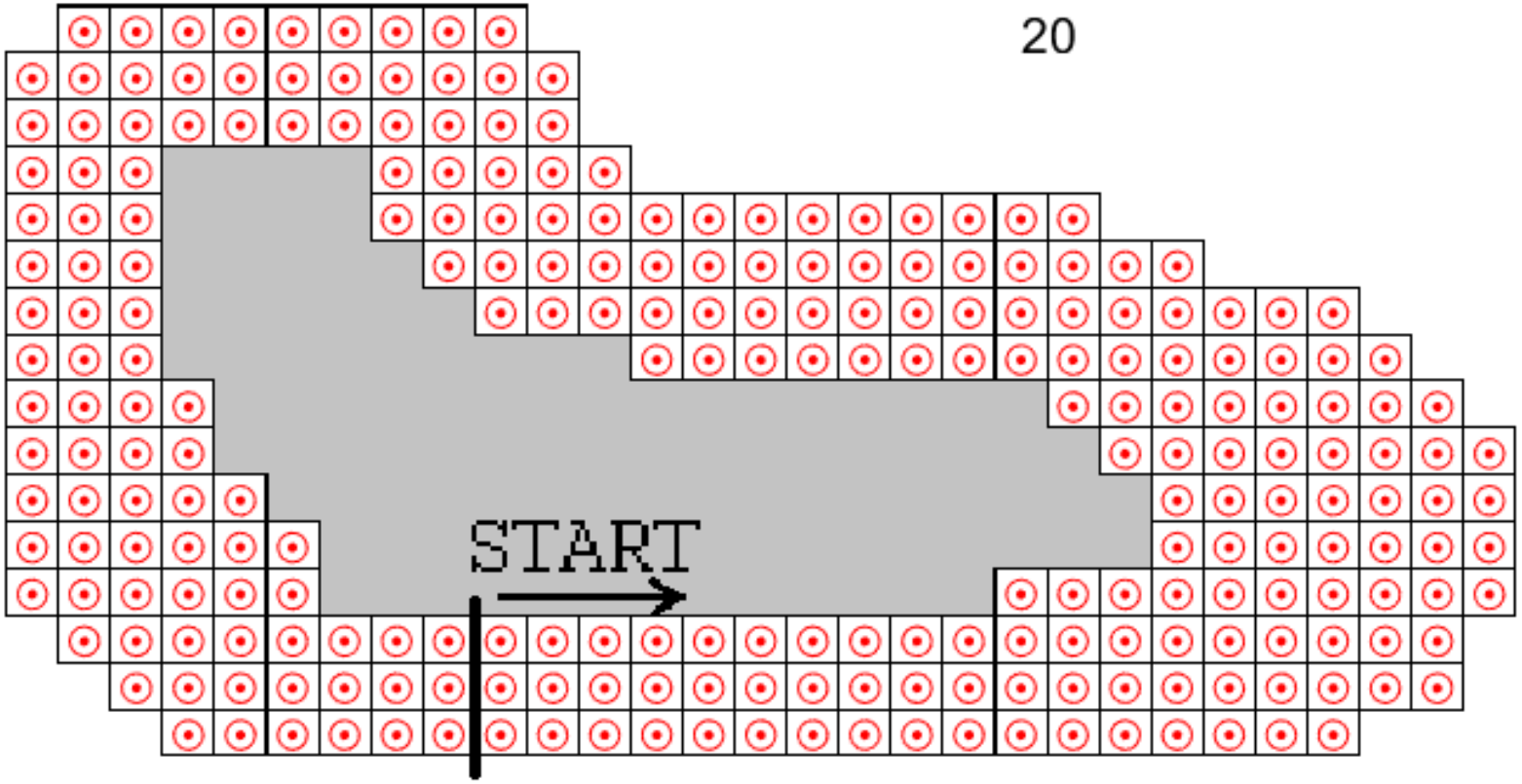
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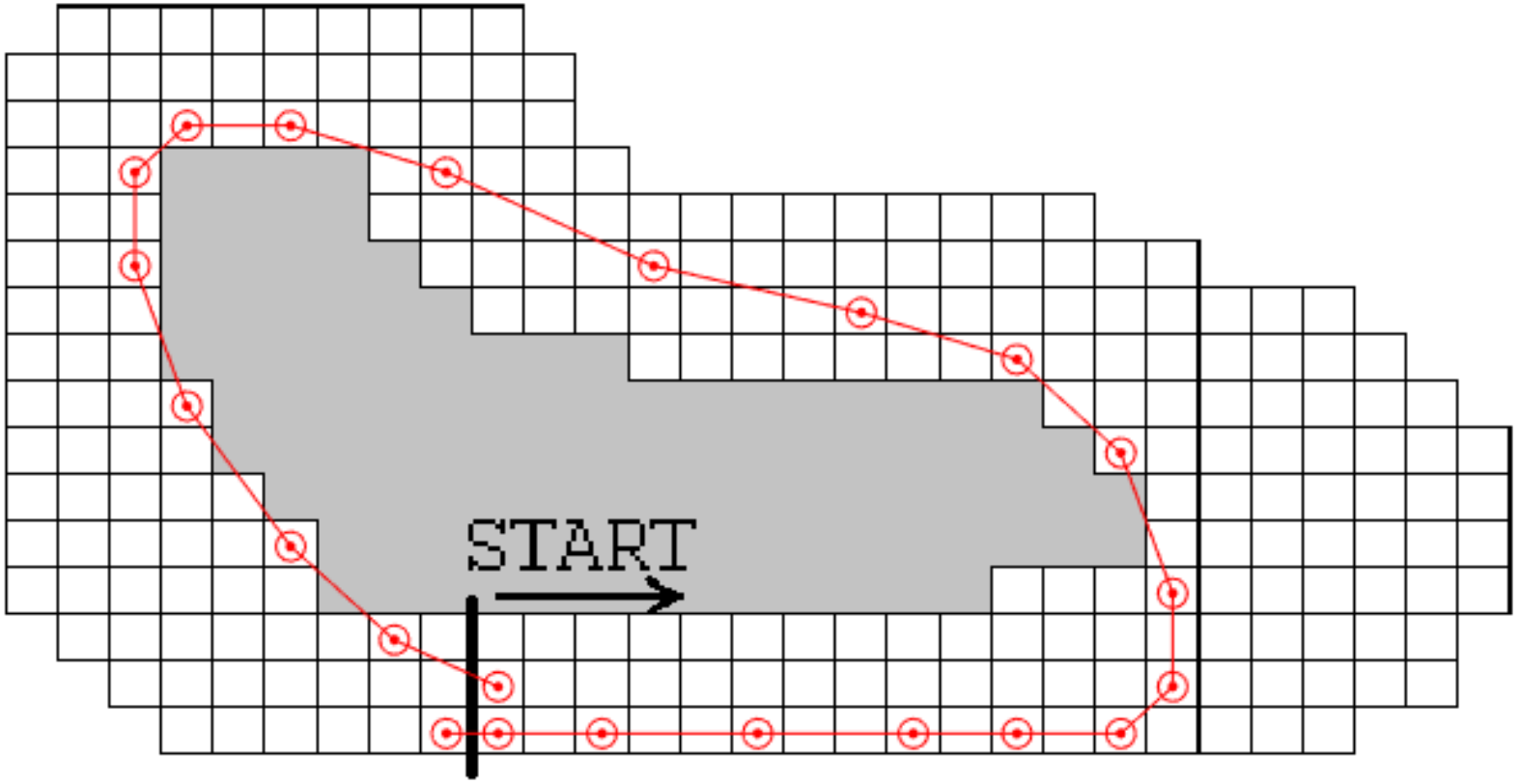
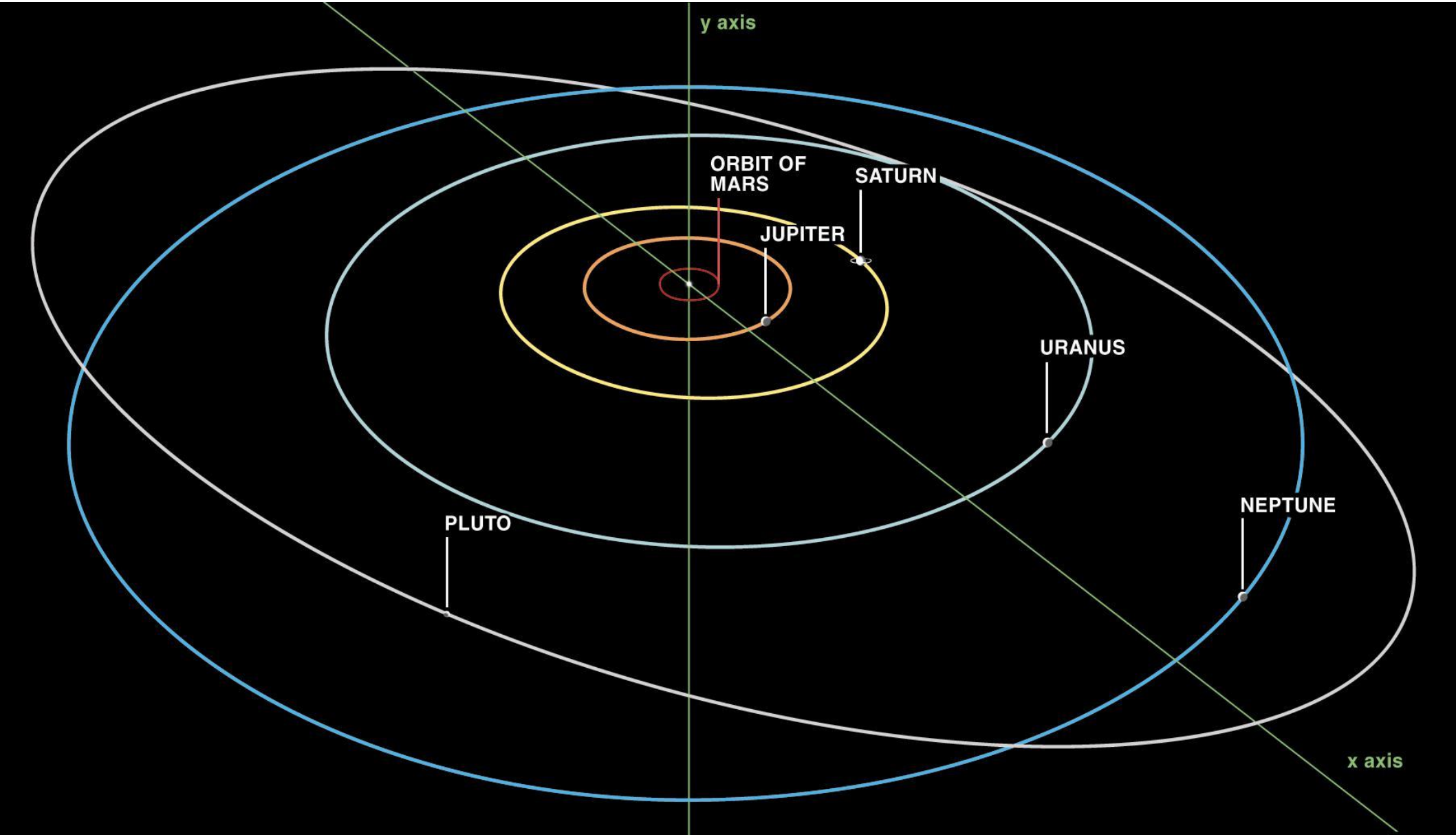

START

How can we make this game more realistic?

GRAN TURISMO

TIME
1st

PETRONAS
EPSON
PETRONAS
PETRONAS
P-ZERO
P-ZERO


y axis
ORBIT OF MARS
SATURN
JUPITER
URANUS
NEPTUNE
PLUTO
x axis

Discovery