

שאלה 3 •

הגשתי את השאלה בקוד (שיטת הנטינגטון-היל – $f(s) = \sqrt{s(s+1)}$)
על כנסת ישראל האחרונה

- ועל כן ערכתי כמה בדיקות על מיקרים מעניינים כדי לראות שהאלגוריתם עובד
ההרצה על הדוגמאות נמצאות בקוד עצמו ובנוסף פתרתי ידנית

TEST1 Basic test with 3 parties and 10 seats

A: 100	B: 200	C: 300	10 seats
			(1, 1, 1)
$\frac{100}{\sqrt{2}} = 70.71$	$\frac{200}{\sqrt{2}} = 141.42$	$\frac{300}{\sqrt{2}} = 212.13$	7 seats
			(1, 1, 2)
70.71	<u>141.42</u>	$\frac{300}{\sqrt{6}} = 122.47$	6 seats
			(1, 2, 2)
70.71	$\frac{200}{\sqrt{6}} = 81.64$	<u>122.47</u>	5 seats
			(1, 2, 3)
70.71	81.64	$\frac{300}{\sqrt{12}} = 86.6$	4 seats
7			(1, 2, 4)
70.71	<u>81.64</u>	$\frac{300}{\sqrt{20}} = 67$	3 seats
			(1, 3, 4)
<u>70.71</u>	$\frac{200}{\sqrt{12}} = 57.7$	67	2 seats
1			(2, 3, 4)
$\frac{100}{\sqrt{6}} = 40.8$	57.7	<u>67</u>	1 seats
			(2, 3, 5)

TEST2 party with little votes

A: 100 B: 200 C: 1

10 Seats

(1, 1, 1)

$$\frac{100}{\sqrt{2}} = 70 \quad \frac{200}{\sqrt{2}} = 141 \quad \frac{1}{\sqrt{2}} = 0.7$$

7 Seats

(1, 2, 1)

$$70 \quad \frac{200}{\sqrt{6}} = 81.64 \quad 0.7$$

6 Seats

(1, 3, 1)

$$70 \quad \frac{200}{\sqrt{12}} = 57.7 \quad 0.7$$

5 Seats

(1, 4, 1)

$$70 \quad \frac{200}{\sqrt{20}} = 44.7 \quad 0.7$$

4 Seats

(2, 4, 1)

$$\frac{100}{\sqrt{6}} = 40.8 \quad \frac{200}{\sqrt{12}} = 57.7 \quad 0.7$$

3 Seats

(2, 5, 1)

$$40.8 \quad \frac{200}{\sqrt{30}} = 36.5 \quad 0.7$$

2 Seats

(3, 5, 1)

$$\frac{100}{\sqrt{12}} = 28.8 \quad \frac{200}{\sqrt{30}} = 36.5 \quad 0.7$$

1 Seats

(3, 6, 1)

TEST 3 party with many votes

A: 100	B: 200	C: 10000	10 seats
$\frac{100}{\sqrt{2}} = 70$	$\frac{200}{\sqrt{2}} = 141$	$\frac{10000}{\sqrt{2}} = 7071$	(1, 1, 1) 7 seats
70	141	$\frac{10000}{\sqrt{6}} = 4082$	(1, 1, 2) 6 seats
70	141	$\frac{10000}{\sqrt{12}} = 2886$	(1, 1, 3) 5 seats
70	141	$\frac{10000}{\sqrt{20}} = 2236$	(1, 1, 4) 4 seats
70	141	$\frac{10000}{\sqrt{30}} = 1825$	(1, 1, 5) 3 seats
70	141	$\frac{10000}{\sqrt{42}} = 1543$	(1, 1, 6) 2 seats
70	141	$\frac{10000}{\sqrt{56}} = 1336$	(1, 1, 7) 1 seats
			(1, 1, 8)

TEST4 party with small difference in votes

A: 100	B: 101	6 seats
		(1, 1)
$\frac{100}{\sqrt{2}} = 70.7$	$\frac{101}{\sqrt{2}} = 71.41$	4 seats
		(1, 2)
$\frac{70.7}{\sqrt{6}}$	$\frac{101}{\sqrt{6}} = 41.2$	3 seats
		(2, 2)
$\frac{100}{\sqrt{6}} = 40.8$	$\frac{41.2}{\sqrt{2}}$	2 seats
		(2, 3)
$\frac{40.8}{\sqrt{2}}$	$\frac{101}{\sqrt{12}} = 29.1$	1 seats
		(3, 3)

TEST5 2 parties, party A has twice the votes of party B

A: 100	B: 50	6 seats
		(1, 1)
$\frac{100}{\sqrt{2}} = 70$	$\frac{50}{\sqrt{2}} = 35.35$	4 seats
		(2, 1)
$\frac{100}{\sqrt{6}} = 40.8$	35.35	3 seats
		(3, 1)
$\frac{100}{\sqrt{12}} = 28$	$\frac{35.35}{\sqrt{2}}$	2 seats
		(3, 2)
$\frac{28}{\sqrt{6}}$	$\frac{50}{\sqrt{6}} = 20$	1 seats
		(4, 2)