Riddle solution:

Let’s take for example the case where we have n=5 and c=1.

As we know that each man can see all other men but can’t see if he has hat on his head, the man with the hat will see that the other men don’t have hats on their head, but there should be at least 1 hat, so the man with the hat will understand that the hat is on his head, so at midnight he’ll dunk underwater and the hat will be removed, so with n=5 and c=1, it will take exactly 1 day for removing the hat.

Now let’s take next example where n=5 and c=2.

One of the guys with hats will see that one more man with hat, and the other guys with no hats will see 2 hats, but as the other guy who hat will also see one hat, but wouldn’t know if he has hat as well. So on the first night, no one will go to dunk underwater because the guys with the hats won’t be sure who of them has the hat on his head. But on the second day one of the guys with hats will understand that there is a hat on his hand because he’ll see that the other guy with hat didn’t dunk last night, so he’ll know that he can dunk to remove the hat from his hat. And the other guy with hat will also realize the same thing because seeing the 3 men with no hats and seeing that the man with hat didn’t dunk last night, he’ll realize that there must a hat on his head as well. So it turns out that when c=2, it will take exactly ‘c’ days for all hats to be removed.