

Pensieve header: Dylan’s 100 prisoners problem, as in monoblog/181001.

Warden to 100 prisoners: I’ve chosen a permutation  $\pi$  of your names and tomorrow I will place each of you in an isolated room with 100 boxes storing  $\pi$ . You will each get to open 50 boxes and you must each open their “own” box. Maximize the probability of success.

Solution in rot13, <https://www.rot13.com/>:

Gurl ahzore gurzfyirf naq gur obkrf. Rnpu bar bcraf gur obk gung pneevrf  
 gurve bja ahzore, gura gur obk jubfr ahzore vf vaqvpngrq jvguva, naq fb ba.  
 Gur cbvag vf gung gur cebonovyvgl gung n crezhgngvba bs yratgu 100 jbhyc  
 unir n plpyr bs yratgu terngre guna 50 (va juvpu pnfr gurl ybbfr) vf cerggl  
 fznyy, nf pna or sbhaq ol qverpg pnyphyngvba.

```
In[*]:= n = 10000;
Sum[N@Binomial[n, k] (k - 1)! (n - k)!, {k, n/2 + 1, n}] / n!
```

```
Out[*]= 0.6930971830599453
```

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In[*]:= Log[2] // N
```

```
Out[*]= 0.693147
```

```
In[*]:= n = 100;
Sum[ $\frac{k}{n}$  Binomial[n, k] (k - 1)! (n - k)!, {k, n/2 + 1, n}] / n!
```

```
Out[*]=  $\frac{1}{2}$ 
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