

# The Birthday Problem

In class, we saw that the probability of having a birthday match in a group of  $n$  people was

$$P(E) = 1 - \frac{365P_n}{365^n}$$

The following table shows the computed probabilities for selected values of  $n$ .

$n$	Probability	$n$	Probability
1	0	26	.5982408201
2	.002739726027	27	.6268592823
3	.008204165885	28	.6544614723
4	.01635591247	29	.6809685375
5	.02713557370	30	.7063162427
6	.04046248365	31	.7304546337
7	.05623570310	32	.7533475279
8	.07433529235	33	.7749718542
9	.09462383389	34	.7953168646
10	.1169481777	35	.8143832389
11	.1411413783	36	.8321821064
12	.1670247888	37	.8487340082
13	.1944102752	38	.8640678211
14	.2231025120	39	.8782196644
15	.2529013198	40	.8912318098
16	.2836040053	41	.9031516115
17	.3150076653	42	.9140304716
18	.3469114179	43	.9239228557
19	.3791185260	44	.9328853686
20	.4114383836	45	.9409758995
21	.4436883352	46	.9482528434
22	.4756953077	47	.9547744028
23	.5072972343	48	.9605979729
24	.5383442579	49	.9657796093
25	.5686997040	50	.9703735796

EXERCISE: Test your calculator skills and see if you can verify a few of the entries in the table using the formula at the top of the page.