1. For a group of 7 people, find the probability that all 4 seasons (winter, spring, summer, fall) occur at least once each among their birthdays, assuming that all seasons are equally likely.

ANS:

first of all number all the seasons, Now
derine
Ai = { ith seasons
we want P(M: Ai)
P(nta Ai)= 1- P((Ai Ai)) = 1- P(Ui Ai)
= 1 - P(P(AS) + P(A2) + P(A3) + P(A4)
P(A,CNA2C) - P(A,CNA3C) - P(A,CNA4C)
-P(A2 NA3)-P(A2 NA4)-P(A3 NA4)
+ P(A1 C N A2 C) + + P(A2 C N A3 C N A4 C)
- P(ACNA2CNA3CNA4C)
= 1 - \ (-1) k+1 /4 / (4-k) - suging
$= 1 - \frac{4}{5} \left(-1\right)^{k+1} \left(4\right) \left(4-k\right)^7 - \left\{\text{using}\right\}$ $= 1 - \frac{4}{5} \left(-1\right)^{k+1} \left(4\right) \left(4-k\right)^7 - \left\{\text{using}\right\}$ $= 1 - \frac{4}{5} \left(-1\right)^{k+1} \left(4\right) \left(4-k\right)^7 - \left\{\text{using}\right\}$ $= 1 - \frac{4}{5} \left(-1\right)^{k+1} \left(4\right) \left(4-k\right)^7 - \left\{\text{using}\right\}$
= 1-437 - 627 -417
$= 1 - 43^{7} + 62^{7} - 41^{7}$ $+ 7 + 47 + 47$

2. Alice attends a small college in which each class meets only once a week. She is deciding between 30 non-overlapping classes. There are 6 classes to choose from for each day of the week, Monday through Friday. Trusting in the benevolence of randomness, Alice decides to register for 7 randomly selected classes out of the 30, with all choices equally likely. What is the probability that she will have classes every day, Monday through Friday?

ANS:

Ans:	
60	Ai = [Alice has not any of classes at i-th
	day in week }
	we want P(ni Aic)
	we want I (III)
	P(n=1 A15) = P(U=1 A1) = 1-P(U=1 A1)
(PANU)9-13- P(JAISA)9-1-(JAIJA)9
	= 1 - (P(A1)+P(A2)+P(A3)+P(A4)+P(A5)-
	P(A1NA2) = P(A4NA5) +
(B)	P(A, NA2 NA3 NA4 NA5)
() () A	(120)9-(2002)-P(2002)-P(050)
BARRO	= 1- \(\(\frac{5}{k} \) \(\partial \) \(\partia
	AKETA A CALK
BNI	$=1-\frac{5}{2}(-1)^{(5)}(\frac{30-6K}{7})$
MW BE CH	K=1 (K) 7
	(30)
	(7)
	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
-	