

p = 179769313486231590772930519078902473361797697894230657273430081157732675805500963132708477322407536021120113879871393357658789768814416622492847430639474124377767893424865485276302219601246094119453082952085005768838150682342462881473913110540827237163350510684586298239947245938479716304835356329624227998859  
q = (p-1) / 2  
g = 3  
A = 112983575163002618947589666666735428181684517845144875096902910066434723952623016603393212501214127399908823223492478725971266042754892798177781267512821607470545283059472689034731313027619864228688466438258327552045437590203790635506728603774799021127049872571983254506993921153718739796769296097404717448108  
B = 111772767805210239496365191691516881043394988196297062013853646674574743401042736447328886156429629192691601526398366088012736749454626686281467579205675084461989494513294624066074137247913037330040487275346913253345733429767781900977102687185378411660147190296412313303321533586102552123457499563789255321369  
  
maxn = 10000  
multiple = 1  
Alice\_a = 0  
for a in range(1, maxn+1):  
 multiple = multiple \* g % p  
 if (multiple % p) == A:  
 Alice\_a = a  
 break  
  
multiple = 1  
Bob\_b = 0  
for b in range(1, maxn+1):  
 multiple = multiple \* g % p  
 if multiple == B:  
 Bob\_b = b  
 break  
  
output\_Alice = B \*\* a % p  
output\_Bob = A \*\* b % p  
  
print(output\_Bob)  
print(output\_Alice)  
  
# k = output\_Alice = output\_Bob = 10828112783453462381041707802056149866596392072243903940987459672779260675319522663099080388770903982546250524992420350200207624327420612300170620802665302905750045777684348125827484365007590718638373187936889967309324722655294992225815410914105072210725045953105019352457540772995508978315699107247398350128