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銷烘湪杴偄康
欫 妯★纤鍀呎細 欫 鏈€澶y鄳绱⌒暟瑕屾英灏忓叞鍊嶆暟 欫 绱豹暚锛呎簫绉 欫 妺ｆ瞄鏆扮旇绱犲景鏆板垎瑪

鏈珬瑕佺偤
欫 鎵十眼gcd涓庤４锃€灜氳悲
欫 妯＄嚔镐柟绑 欫 妯＄嚔镐柟绑嬬耗欫旂瞄鎺籍壈浣櫸矗镚

欫 棰樿枔娈垆庢娉
欫 缂浜莚绲挎€鍖绱豹暚 欫 娆銐嬬毊暚

鎵十眼gcd涓庤４锃€灜氳悲
欫 鏈€澶y绉绌⌒暚鏅 = gcd(a,b) 欫 瑁磋英灜氳悲锛氳鍒⌒v浣垮緱 a*u + b*v = d 欫 瑁磋英灜氳悲瀾逤绾锛氳氬嫛a,b浜拰川锛宒cd(a,b) = 1 鎹櫖珤鍒⌒,v 浣垮緱 a*u + b*v = 1 欫 璁 a = pd, b = qd, 鎹橀,q浜拰川锛堜负浠€涔瑜绾锛 瑁磋英灜氳悲 pdu + qdv = d -> pu + qv = 1 杞绻鐤涓虹嫚渚

瑁磋英灜氳悲鐑 璇偨瑾
欫 欫 欫 欫 鐉瀛帷镳鍔€犄瓽u,v au + bv = d (a-b)u + b(u+v) = d 欫 = a%b, 浠 浣垮緱a = b*t + a欫
欫 t = [a/b]

欫 (a-tb)u + b(tu + v) = d 欫 a欫欏 + b(tu+v) = d 欫 浠 欫 = tu+v, 寰橋娘a欫欏 + bv欫 = d

鎵十眼gcd绾樻棬
欫 浠 欫 = tu+v, 寰橋娘a欫欏 + bv欫 = d 欫 v = v欫 欫 tu 鐢ょ熷焊(u, v欫)鎹櫖蒍璁ｄ互(u,v) int gcd(int a, int b){ return b==0?a:gcd(b,a%b); } int ex_gcd(int a,int b, int &u, int &v){ If (b == 0){ u = 1, v = 0; Return a; } int d = ex_gcd(b, a%b, v, u); v = v - a/b *u; return d; }

娉ㄥ剰1鎷橀嚔鐩鐟浆 娉ㄥ剰2鎷橀嚔鐩鐏煿鐟锛堚欛

妯＄嚔镐柟绑
欫 ax = d (mod b) abd 宸茬煡姼侀 欫 杞绻鐤涓篿x + by = d 娉ㄥ瓙灞鏄cd姼侊y
欫 娉ㄥ剰2鐏煿鐟锛堚欛 欫 鎷ㄥ眫x,y璇勫瓙闃瓨渚灈鐭冩od b澶勭悲

涓嗘沵鍓十绱灜氳悲
欫 璁緥缂勫悲(ai, bi)锛岄朵瑙bi涓や袱浜堅纰 欫 姼侀浣垮緱
x = a1 mod b1 x = a2 mod b2 ... x = an mod bn

涓嗘沵鍓十绱灜氳悲
欫 浠 = b1*b2*b3欫*bn 欫 浠 i = B/bi = b1*b2*..*b(i-1)*b(i+1)..*bn 欫 鐑劇勃鏈姏 涓曞浜纰锛呮棋鑳屸浂鍒⌒唍姝笀涶 mi*ci = bi (mod b) 欫 x = a1b1m1 + a2b2m2 + 欫+anbnmn
欫 涓叚粠浣垮娉娑鐞 B锛 欫 鐚佸厛绾欐灛緷鍏缓鏉ㄥ寮鏈鍓濄灙绾

涓嗘沵鍓十绱灜氳悲
欫 欫 欫 欫 欫 璁緥缂勫悲(ai, bi)锛岄朵瑙bi涓や袱浜纰 濡傚灊bi涓嗘灂涓や袱浜纰鍜 绾 鍙笉涓 搴瑰皧妺绀栨 x = a1(mod b1) x = a2(mod b2) ->x + u*b1 = a1, x - v*b2 = a2 -> u*b1 + v*b2 = (a1-a2)

欫 鎺栦负瑁磋英灜氳悲璇勫悲寰墏锛夌紵鏈夎B寮撴饮浠 寮 gcd(b1, b2) | (a1-a2)

涓嗘沵鍓十绱灜氳悲璇勫悲寰墏锛夋
欫 欫 欫 欫 浜庢橀鏀瓒滃寰橋娘浜嗕悲 垵濮嫔殑(u,v)璁板伴(u0,v0) u*b1 + v*b2 = (a1-a2) 璇勫墏绲鍙(u,v) 姼笀涶 u = u0 + tb2/gcd(b1,b2) v = v0 欫 tb1/gcd(b1,b2)
欫 锛呯娉娑€涔愉绾锛

欫 x + u*b1 = a1 欫 x 璇勫姩B绲娲祴涓 a1 欫 u0b1 - t(b1b2)/gcd(b1b2)
= a1 - u0b1 - t*LCM(b1,b2)

涓嗘沵鍓十绱灜氳悲璇勫悲寰墏锛夋
欫 x = a1 - u0b1 - t*LCM(b1,b2)

欫 缂浜鐜悵搴鏅墠鎬瓒滄帋绉鍖浜や泤鍖鍦ｇ嚔涔瑜绾锛 鍜圭▼锛 欫 x = a1-u0b1 (mod LCM(b1,b2)) 欫 姼忔┕鍜圭▼锛鏆欫-1 缂x画鐗欏柯娑埌笅娴ュ緱 鐏崇彂浠ュ緱 鍙瑨璇勫姩彨鐭悩B绲娲祴閽 欫 娉ㄥ剰绱灜壈穲鎸绝鐟涙瘮娉寰墏鏆浜虹墠绛 娑涓 瑪9乚闁杈у

棰樿枔娈垆庢娉
欫 欫 欫 欫 欫 a11x1 + a12x2 + .. + a1nxn = b1 a21x1 + a22x2 + .. + a2nxn = b2 欫 am1 x1 + am2x2 + .. + amnxn = bm 姼偋B<x1, x2, 欫 n> 涓€鑷琤=n

欫 濡傛灢