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<pre>graph LR A[1] --> B[2] A --> C[3] B --> D[4] B --> E[5] C --> F[6] C --> G[7] D --> H[8] D --> I[9] E --> J[10] E --> K[11] F --> L[12] F --> M[13] G --> N[14] G --> O[15] H --> P[16] H --> Q[17] I --> R[18] I --> S[19] J --> T[20] J --> U[21] K --> V[22] K --> W[23] L --> X[24] L --> Y[25] M --> Z[26] M --> AA[27] N --> AB[28] N --> AC[29] O --> AD[30] O --> AE[31] P --> AF[32] P --> AG[33] Q --> AH[34] Q --> AI[35] R --> AJ[36] R --> AK[37] S --> AL[38] S --> AM[39] T --> AN[40] T --> AO[41] U --> AP[42] U --> AQ[43] V --> AR[44] V --> AS[45] W --> AT[46] W --> AU[47] X --> AV[48] X --> AW[49] Y --> AX[50] Y --> AY[51] Z --> AZ[52] Z --> BA[53] AA --> BB[54] AA --> BC[55] AB --> BD[56] AB --> BE[57] AC --> BF[58] AC --> BG[59] AD --> BH[60] AD --> BI[61] AE --> BJ[62] AE --> BK[63] AF --> BL[64] AF --> BM[65] AG --> BN[66] AG --> BO[67] AH --> BP[68] AH --> BQ[69] AI --> BR[70] AI --> BS[71] AJ --> BT[72] AJ --> BU[73] AK --> BV[74] AK --> BW[75] AL --> BX[76] AL --> BY[77] AM --> BZ[78] AM --> CA[79] AN --> CB[80] AN --> CC[81] AO --> CD[82] AO --> CE[83] AP --> CF[84] AP --> CG[85] AQ --> CH[86] AQ --> CI[87] AR --> CJ[88] AR --> CK[89] AS --> CL[90] AS --> CM[91] AT --> CN[92] AT --> CO[93] AU --> CP[94] AU --> CQ[95] AV --> CR[96] AV --> CS[97] AW --> CT[98] AW --> CU[99] AX --> CV[100] AX --> CW[101] AY --> CX[102] AY --> CY[103] AZ --> CZ[104] AZ --> DA[105] BA --> DB[106] BA --> DC[107] BB --> DD[108] BB --> DE[109] BC --> DF[110] BC --> DG[111] BD --> DH[112] BD --> DI[113] BE --> DJ[114] BE --> DK[115] BF --> DL[116] BF --> DM[117] BG --> DN[118] BG --> DO[119] BH --> DP[120] BH --> DQ[121] BI --> DR[122] BI --> DS[123] BJ --> DT[124] BJ --> DU[125] BK --> DV[126] BK --> DW[127] BL --> DX[128] BL --> DY[129] BM --> DZ[130] BM --> EA[131] BN --> EB[132] BN --> EC[133] BO --> ED[134] BO --> EE[135] BP --> EF[136] BP --> EG[137] BQ --> EH[138] BQ --> EI[139] BR --> EJ[140] BR --> EK[141] BS --> EL[142] BS --> EM[143] BT --> EN[144] BT --> EO[145] BU --> EP[146] BU --> EQ[147] BV --> ER[148] BV --> ES[149] BW --> ET[150] BW --> EU[151] BX --> EV[152] BX --> EW[153] BY --> EX[154] BY --> EY[155] BZ --> EZ[156] BZ --> FA[157] CA --> FB[158] CA --> FC[159] CB --> FD[160] CB --> FE[161] CC --> FF[162] CC --> FG[163] CD --> FH[164] CD --> FI[165] CE --> FJ[166] CE --> FK[167] CF --> FL[168] CF --> FM[169] CG --> FN[170] CG --> FO[171] CH --> FP[172] CH --> FQ[173] CI --> FR[174] CI --> FS[175] CJ --> FT[176] CJ --> FU[177] CK --> FV[178] CK --> FW[179] CL --> FX[180] CL --> FY[181] CM --> FZ[182] CM --> GA[183] CN --> GB[184] CN --> GC[185] CO --> GD[186] CO --> GE[187] CP --> GF[188] CP --> GG[189] CQ --> GH[190] CQ --> GI[191] CR --> GJ[192] CR --> GK[193] CS --> GL[194] CS --> GM[195] CT --> GN[196] CT --> GO[197] CU --> GP[198] CU --> GQ[199] CV --> GR[200] CV --> GS[201] CW --> GT[202] CW --> GU[203] CX --> GV[204] CX --> GW[205] CY --> GX[206] CY --> GY[207] CZ --> GZ[208] CZ --> HA[209] DA --> HB[210] DA --> HC[211] DB --> HD[212] DB --> HE[213] DC --> HF[214] DC --> HG[215] DD --> HH[216] DD --> HI[217] DE --> HJ[218] DE --> HK[219] DF --> HL[220] DF --> HM[221] DG --> HN[222] DG --> HO[223] DH --> HP[224] DH --> HQ[225] DI --> HR[226] DI --> HS[227] DJ --> HT[228] DJ --> HU[229] DK --> HV[230] DK --> HW[231] DL --> HX[232] DL --> HY[233] DM --> HZ[234] DM --> IA[235] DN --> IB[236] DN --> IC[237] DO --> ID[238] DO --> IE[239] DP --> IF[240] DP --> IG[241] DQ --> IH[242] DQ --> II[243] DR --> IJ[244] DR --> IK[245] DS --> IL[246] DS --> IM[247] DT --> IN[248] DT --> IO[249] DU --> IP[250] DU --> IQ[251] DV --> IR[252] DV --> IS[253] DW --> IT[254] DW --> IU[255] DX --> IV[256] DX --> IW[257] DY --> IX[258] DY --> IY[259] DZ --> IZ[260] DZ --> JA[261] EA --> JB[262] EA --> JC[263] EB --> JD[264] EB --> JE[265] EC --> JF[266] EC --> JG[267] ED --> JH[268] ED --> JI[269] EE --> JJ[270] EE --> JK[271] EF --> JL[272] EF --> JM[273] EG --> JN[274] EG --> JO[275] EH --> JP[276] EH --> JQ[277] EI --> JR[278] EI --> JS[279] EJ --> JT[280] EJ --> JU[281] EK --> JV[282] EK --> JW[283] EL --> JX[284] EL --> JY[285] EM --> JZ[286] EM --> KA[287] EN --> KB[288] EN --> KC[289] EO --> KD[290] EO --> KE[291] EP --> KF[292] EP --> KG[293] EQ --> KH[294] EQ --> KI[295] ER --> KJ[296] ER --> KK[297] ES --> KL[298] ES --> KM[299] ET --> KN[300] ET --> KO[301] EU --> KP[302] EU --> KQ[303] EV --> KR[304] EV --> KS[305] EW --> KT[306] EW --> KU[307] EX --> KV[308] EX --> KW[309] EY --> KX[310] EY --> KY[311] EZ --> KZ[312] EZ --> LA[313] FA --> LB[314] FA --> LC[315] FB --> LD[316] FB --> LE[317] FC --> LF[318] FC --> LG[319] FD --&gt</pre>
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graph land as dic

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mat = [[0, 0, 0], [0, 1, 0], [0, 0, 0]]
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[illegible][illegible]

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result += stack.pop()
return result[::-1]
```

```
def union_find(self, edges: list[list[int]] -> list[int]:
    parent = list(range(10000))
    find = lambda x: x if parent[x] == x else find(parent[x])
    union = lambda x, y: (x := find(x), y := find(y)) and parent[..._x] = y
    return result[(i, j) for i, j in edges if not union(i, j)]

def union_find(self, edges):
    parent = [i for i in range(10000)]
    for i, j in edges:
        if parent[i] != parent[j]:
            parent[i] = parent[j]
    return i, j
return parent[find(i)]
```

$$w_-(x, y) \text{ as } x \rightarrow y$$

