Answers to Exercises   JiachengLI 10 307 457

Week 1

Q1:

Expression: Table[Replace[Replace[Replace[x, RotI],RefB],RotIinv],{x,1,26,1}]

Output: {8,11,13,19,6,5,16,1,14,12,2,10,3,9,21,7,26,25,4,22,15,20,24,23,18,17}

Q2:

List of pairs:

{(1,8),(2,11),(3,13),(4,19),(5,6),(7,16),(9,14),(10,12),(15,21),(17,26),(18,25),(20,22),(23,24)}

Q3:

EnigmaGuts: {1→8,2→11,3→13,4→19,5→6,6→5,7→16,8→1,9→14,10→12,11→2,12→10,13→3,14→
9,15→21,16→7,17→26,18→25,19→4,20→22,21→15,22→20,23→24,24→23,25→18,26→17}

Q4:

Expression: Table[ReplaceAll[x,EnigmaGuts],{x,1,26,1}]

Output: {8,11,13,19,6,5,16,1,14,12,2,10,3,9,21,7,26,25,4,22,15,20,24,23,18,17}

Q5:

Expression: Table[Enigma1[1,n],{n,0,25,1}]

Output: {8,10,11,16,2,26,10,20,6,3,18,25,17,22,7,18,10,8,12,3,21,25,2,26,20,18}

Q6:

Expression: MapThread[Enig-
ma1,{{8,10,11,16,2,26,10,20,6,3,18,25,17,22,7,18,10,8,12,3,21,25,2,26,20,18},{0,1,2,3,4,5,6,7,8,9,10,11,
12,13,14,15,16,17,18,19,20,21,22,23,24,25}}]

Output: {1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1}

Week 2

Q1:

Expression: EnigmaMachine[text_,key_] := MapThread[Enigma1,{text,Table[n,{n,key,key+Length[-
text]-1,1}]}]

Q2:

Expression: EnigmaMachine[{1,2,3,4,5},28]

Output: {11,3,12,9,22}

Expression: EnigmaMachine[EnigmaMachine[{1,2,3,4,5},28],28]

Output: {1,2,3,4,5}

Q3:

Location: {17,4,14,6,17,3,4,23,8,8,19,3,1,24,22,11,6,22,15}

                {1,3,4,23,9,2,12,8}

             ↑

Number of the elements:5

Q4:

s	s + 1	s + 2	s + 3	s + 4	s + 5	s + 6	s + 7	s + 8
1	3	4	23	□	□	□	8	□
3	4	23	8	□	□	□	1	□

Distance: 7

Q5:

Key: 19 for the start of the cribbed plaintext.

Bombe Expression:

Bombe[plain_,cyfrag_,k_]:=If[Enigma1[plain[[1]],k]==cyfrag[[1]]&&cyfrag[[1]]==plain[[1+1]]&&Enigma1[plain[[1+1]],k+1]==cyfrag[[1+1]]&& cyfrag[[1+1]]==plain[[1+2]]&&Enigma1[plain[[1+2]],k+2]==cyfrag[[1+2]]&& cyfrag[[1+2]]==plain[[1+3]]&& Enigma1[plain[[1+3]],k+3]== cyfrag[[1+3]]&&cyfrag[[1+3]]==plain[[1+7]]&& Enigma1[plain[[1+7]],k+7]==cyfrag[[1+7]]&&cyfrag[[1+7]]==plain[[1]],{"YES!!!",k},{"no"}]

Q6:

Key:14 for the start of the whole cyphertext.

Q7:

Expression:

EnigmaMachine[{17,4,14,6,17,3,4,23,8,8,19,3,1,24,22,11,6,22,15},14]

Output:

{18,15,3,7,22,1,3,4,23,9,2,12,8,17,21,6,8,3,9}

Decryption:

rocgvacdwiblhqufhci

Week 3

Week 4

Week 5