Instructions

1. Parity check matrix and tanner graph:

* Create a tanner graph with the help of matrix given.
* Left click on circles. When they turn yellow in color, drag the mouse to rectangle and again left click to create line between circle and rectangle.
* To delete line, press the scissor button on left and then click on the line to be deleted.
* Home button in bottom right corner will take you to main window.
* Once completed, press submit button on top right corner to finish. If your score is 100 , you can go to next level, otherwise you can try again!

1. Valid codeword:

* Check the validity of codeword using the matrix given.
* Click the ‘’tick’’ button or ‘ cross’ button according to your answer.
* Once finished, click submit button on top right corner. If you win , you can proceed to next level and if you don’t win , try again.

1. Hard Decision decoding:

* Click on right arrow button to begin first phase which is message passing from circles to rectangle. Click “0/1” button that appear on orange line , to select message passed by circle to rectangle associated with the line. Click right arrow button once you finished with one rectangle.
* You can click left arrow button to go to previous rectangle and edit the messages.
* Home button in bottom right corner will take you to main window
* Once you are finished with all the rectangles and if your messages to all the rectangles are correct, you can proceed to second phase otherwise you will be in first phase.
* In second phase , click “0/1” button that appear on orange line , to select message from rectangle to circle. If all your messages are correct then only you can go next phase.
* In third phase you have to submit final answer by clicking on buttons that appears below in the screen. Once you are finished, click the submit button . If you score 100 , you can proceed to next level otherwise you can try again.

1. Girth : Smallest Cycle

* Select the smallest cycle in tanner graph by clicking on yellow lines.
* Once finished , press submit button.
* Home button will take you to main window

1. Gallager formula:

* In this level, you have to prove gallager formula by manipulating the given first expression.
* Home button in bottom right corner will take you to main window
* You can click buttons to select appropriate term that should be there. Once finished, click submit button. If your answer is correct , you would have cleared all the levels and if not, then try again.

Hints

1. Tanner Graph:

* There are 4 rows and 8 columns in matrix. Corresponding to that there are 4 rectangles and 8 circles.
* Corresponding to each “1” in matrix , draw a line.

1. Valid codeword:

* Check if each row in H.cT matrix have even no. of 1’s.

1. Hard decision decoding:

* In first phase , messages to rectangles from circles are received bits.
* In second phase, message send by a rectangle to a particular circle included with messages sent to rectangle in first phase by other circles, should have even no. of 1’s.
* In third phase, choose 1 or 0 as decided by majority in received bits included with messages received by circles.

1. Girth: Smallest Cycle

* Smallest cycle length is 6

1. Gallager formula:

* No need.