Below is a table with some key values and their hashindexes. Using this information, perform the given operation in each of the following ***linear probing hash tables*** below

|  |  |
| --- | --- |
| Key | Hash Index |
| black | 5 |
| white | 6 |
| red | 6 |
| orange | 1 |
| yellow | 9 |
| green | 8 |
| blue | 7 |
| violet | 0 |
| teal | 8 |
| pink | 5 |
| brown | 2 |

a) Insert the following keys into the table in the order given (2 marks)

white, red, green, teal, violet, yellow, orange

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

b) remove ***black*** from the following table. Write out what the new table looks like once you finish the remove operation in the empty table below (2 mark)

5 5 7 8 6

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | black | pink | blue | teal | red |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Remove black and re-insert pink and red

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | pink | red | blue | teal |  |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

c) remove ***pink*** from the following table. Write out what the new table looks like once you finish the remove operation in the empty table below (3 marks)

0 6 2 5 5 6 8 9

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| violet | red | brown |  |  | black | pink | white | teal | yellow |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Remove pink and reinsert white and red

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| violet |  | brown |  |  | black | white | red | teal | yellow |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |