

Ch 8 Quiz

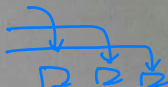
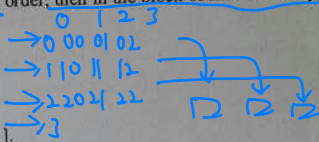
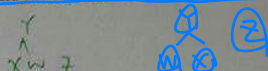
Multiple Choice Questions (10%)

Last in first out

0052101 1111111
2 = A

77

- Which of the following is a LIFO structure?
A. Array B. Stack C. Queue D. Tree
- Which of the following is static in the sense that it does not change size or shape as information is stored and retrieved?
A. Array B. Stack C. Queue D. Tree
- Suppose a binary tree contained the nodes W, X, Y, and Z. If W and X were children of Y, and Z had no children, which node would be the root?
A. W B. X C. Y D. Z
- If the two-dimensional array X were stored in row-major order, then in the block of main memory containing X, which of the following would be true?
A. The entry X[1,2] would appear before X[2,1].
B. The entry X[1,2] would appear after X[2,1].
C. The entry X[1,2] would be in the same location as X[2,1].
D. None of the above
- Which of the following is not used when determining the location of an entry in a two-dimensional array stored in row-major order?
A. Indices B. Number of rows in the array
C. Address polynomial D. Number of columns in the array

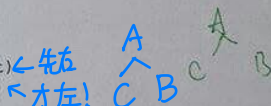


Fill-in-the-blank/Short-answer Questions (90%)

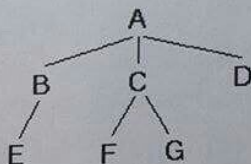
- Draw a binary tree in which all the nodes of A, B and C will be printed in alphabetical order by the following recursive procedure? (7%)

```

def printTree (Tree):
    if (Tree is not None):
        print (Tree.Value)
        printTree (Tree.Right)
        printTree (Tree.Left)
  
```



- Answer the following questions in terms of the tree below. (8%)



- The root node is A.
- Three nodes that are siblings are B, C, and D.
- The terminal nodes are E, F, G, D, and B.
- The node with only one child is B.

- Two special forms of lists are the LIFO structures known as stack, in which entries are inserted and removed from the head, and FIFO structures known as queue, in which entries are removed from the head and inserted at the tail. (10%)

- 7 4. Suppose the expression $X[I, 1]$ referred to the first-row, first-column entry in a two-dimensional array with 5 rows and 7 columns. If the array is stored in row-major order beginning at memory address x and each entry in the array requires n memory cells, what address polynomial would be used to compute the address of the beginning of the entry $X[I, J]$? (7%)

$$x + n(7(I-1) + J - 1)$$

$$x + 5n + Jn$$

$$x + n(7(I-1) + (J-1))$$

row-major

$$x + (n \times (I-1)) + (J-1)n$$

- 7 5. Suppose the expression $X[0, 0]$ referred to the first-row, first-column entry in a two-dimensional array with 5 rows and 7 columns. If the array is stored in column-major order beginning at memory address x and each entry in the array requires n memory cells, what address polynomial would be used to compute the address of the beginning of the entry $X[I, J]$? (7%)

$$x + n(5J + I)$$

$$x + (I + 7J)n$$

$$x + n(I + 5J)$$

$$x(I) + 5Jn$$

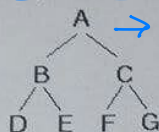
* 0 Based

6. If a queue contained the entries B, C, D (from head to tail), what would be the contents of the queue (again from head to tail) after one entry was removed and the entry A was inserted? (6%)

head tail
C D A

Head tail
A C D A

7. What sequence of nodes from the tree would be printed if the following recursive procedure were applied to it? (7%)



```

def printTree(Tree):
    if (Tree is not None):
        print(Tree.Value)
        printTree(Tree.Right)
  
```

ACG

ACG

8. Based on the tree structure of question 7, what sequence of nodes from the tree would be printed if the following recursive procedure were applied to it? (The procedure uses a global stack called Stack that is assumed to begin empty.) (7%)

```

def printTree(Tree):
    if (Tree is not None):
        Stack.push(Tree.Value)
        printTree(Tree.Right)
    if (not Stack.isEmpty()):
        print(Stack.pop())
  
```

GCA

ACG

GCA

A
C
G

G
C
A
Stack

- 4 9. The table below represents a portion of a computer's main memory containing a binary tree. Each node consists of three cells, the first being data, the second being a pointer to the node's left child, and the third being a pointer to the node's right child. If the null pointer is represented by 00 and the tree's root pointer contains 56, what data is in the left child of the root node? (7%)

Address	Contents
50	AA
51	53
52	00
53	BB
54	00
55	00
56	CC
57	50
58	00

