CHAPTER 8 WRITTEN:

1).Why is the linear search also called "sequential search"?

It loops sequentially step through an array, starting with the first element. It compares each element with the value being searched for, and stops when either the value is found or the end of the array is encountered.

3.)In an average case involving an array of N elements, how many times will a linear search function to read the array to locate a specific value? -

N/2 times

5.)What is the maximum number of comparisons that a binary search function will make when searching for a value in a 1,000-element array? -

Log2(1000) = 10 times

Formula: Log2(N)

7.)Why is the selection sort more efficient than the bubble sort on large arrays? -

Selection sort performs fewer exchanges because it moves items immediately to their final position in the array.

9.)The _____ search algorithm repeatedly divides the portion of an array being searched in half. -

Binary search

11.)The _____ search algorithm requires that the array's contents be sorted. -

Binary search

13.)If an array is sorted in _____ order, the values are sorted from highest to lowest. -

Descending

15.)If data are sorted in descending order, it means they are ordered from lowest value to highest value. -

F

17.)The maximum number of comparisons performed by the linear search on an array of N elements is N/2 (assuming the search values are consistently found). -

F, N times because it went through all of them

18.) Complete the following table

Array Size	50	500	10,000	10,000,000
Linear Search Avg Comparisons	25	250	5,000	5,000,000
Linear Search Max Comparisons	50	500	10,000	10,000,000
Binary Search Max Comparisons	6 about	9 about	14 about	25 about

CHAPTER 9 WRITTEN:

1.)What does the indirection operator do? -

The * (indirection) operator dereferences the value referred to by the pointer type operand, and it is used to access the value stored in an address.

3.)What are the three different uses for the * operator? -

Multiplication operator, pointer definition, indirection operator

5.)Assuming ptr is a pointer to an int, what happens when you add 4 to ptr? -

The value 16 is added to the memory address of ptr.

7.)What is the purpose of the new operator? -

allocate memory dynamically at runtime

9.)What is the purpose of the delete operator? -

deallocate the memory allocated by the new operator

11.)What is the difference between a pointer to a constant and a constant pointer?

A pointer to constant may not be used to change the value it points to.

13.)Each byte in memory is assigned a unique ____ -
Address

15.)_____ variables are designed to hold addresses -
Pointer

17.)Array names can be used as ____, and vice versa. -
pointers

19.)The _____ operator is used to dynamically allocate memory -
new

21.)A pointer that contains the address 0 is called a(n) _____ pointer. -
null

23.)You should only use pointers with delete that were previously used with _____.
new

25.)Look at the following array definition:
int set[10];
Write a statement using ptr notation that stores the value 99 in set[7]; -
*(set + 7) = 99;

27.)Assume that tempNumbers is a pointer that points to a dynamically allocated array. Write code that releases the memory used by the array. -
delete []tempNumbers;

29.)Write the definition of ptr, a pointer to a constant int. -
const int value;
int *ptr = &value;

31.)T/F: Each byte of memory is assigned a unique address -
true

33.)T/F: Pointer variables are designed to hold addresses. -

True, by definition they are designed to hold addresses.

35.)T/F: The & operator dereferences a pointer. -
False, as by definition of the address operator.

37.)T/F: Array names cannot be dereferenced with the indirection operator. -
False

39.)T/F: The address operator is not needed to assign an array's address to a pointer.
True

41.)T/F: Any mathematical operation, including multiplication and division, may be performed on a pointer. -
False, pointer doesn't support all arithmetic operations.

43.)T/F: When used as function parameters, reference variables are much easier to work with than pointers. -
True, as reference variable acts as an alias to original variable used as an argument.

45.)T/F: A pointer variable that has not been initialized is called a null pointer. -
False, as a pointer that contains the address 0 is called a null pointer.

47.)T/F: In using a pointer with the delete operator, it is not necessary for the pointer to have been previously used with the new operator. -
False, as delete operator is used to free memory that was allocated with new.

49.)
Should be ptr = &x;

51.)
Should be *ptr = 100;

55.)
Int ivalue must be declared before

CHAPTER 10 WRITTEN:

1.)What header file must you include in a program using character testing functions such as isalpha and isdigit? -

#include <cctype>

3.)Assume c is a char variable. What value does c hold after each of the following statements executes?

Statement Contents of c

c = toupper('a'); _____

c = toupper('B'); _____

c = tolower('D'); _____

c = toupper('e'); _____ -

A

B

d

E

5.)What header file must you include in a program using string functions such as strlen and strcpy? -

#include <cstring>

7.)What header file must you include in a program using string class objects? -

#include <string>

9.)The ___ function returns true if the character argument is uppercase. -

isupper

11.)The ___ function returns true if the character argument is a digit. -

isdigit

13.)The ___ function returns the uppercase equivalent of its character argument. -

toupper

15.)The ___ file must be included in a program that uses character testing functions. -

cctype

17.)To ___ two strings means to append one string to the other. -

concatenate

19.)The ___ function copies one string to another. -

strcpy

21.)The ___ function compares two strings. -
strcmp

23.)The ___ function returns the value of a string converted to an integer. -
atoi

25.)The ___ function returns the value of a string converted to a float. -
atof

33.)T/F: Character testing functions, such as isupper, accept strings as arguments and test each character in the string.
False, accepts only characters

34.)T/F: If toupper's argument is already uppercase, it is returned as it, with no changes.
True

35.)T/F: If tolower's argument is already lowercase, it will be inadvertently converted to uppercase.
False, stays the same

36.)T/F: The strlen function returns the size of the array containing a string. -
False, returns length

37.)T/F: If the starting address of a string is passed into a pointer parameter, it can be assumed that all the characters, from that address up to the byte that holds the null terminator, are part of the string. -
True

38.)T/F: String-handling functions accept as arguments pointers to strings (array names or pointer variables), or literal strings. -
True

39.)T/F: The strcat function checks to make sure the first string is large enough to hold both strings before performing the concatenation. -
False, strncat
40.)T/F: The strcpy function will overwrite the contents of its first string argument.
True

41.)T/F: The strcpy function performs no bounds checking on the first argument. -
True

42.)T/F: There is no difference between "847" and 847. -
False, one is a string and one is an int

CHAPTER 12 WRITTEN:

1.)What capability does the fstream data type provide that the ifstream and ofstream data types do not?
The fstream data type allows both reading and writing, while the ifstream data type allows only for reading, and the ofstream data type allows only for writing.

3.)Assume that the file data.txt already exists, and the following statement executes.
fstream file(data.txt, ios::out);
What happens to the file? -
Its contents erased and overwritten

5.)Should file stream objects be passed to functions by value or by reference? Why? -
By reference because the internal state of file stream objects changes with most every operation. They should always be passed to functions by reference to ensure internal consistency.

7.)Under what circumstances is a file stream object's ios::eofbit bit set? What member function reports the state of this bit? -
When the end of the file has been encountered. The eof member function reports the state of this bit

9.)How do you read the contents of a texT/File that contains whitespace characters as part of its data?
By using the getline member function

11.)What arguments do you pass to a file stream object's read member function? -
Two arguments: The starting address in char form of the section of memory where the data will be stored, and the number of bytes to read.

13.)What is the difference between the seekg and seekp member functions? -

The seekg function moves a file's read position, and the seekp function moves a file's write position.

15.)If a program has read to the end of a file, what must you do before using either the seekg or seekp member functions? -
Call the file object's clear member function.

17.)How do you rewind a sequential-access file? -
Use the seekg member function to move the read position back to the beginning of the file.

19.)If a file fails to open, the file stream object will be set to _____. -
NULL or 0

21.)The _____ function reads a line of texT/From a file. -
getline

23.)The _____ member function writes a single character to a file. -
put

25.)_____ files contain data formatted as _____. -
text, ASCII text

27.)In C++, _____ provide a convenient way to organize data into fields and records. -
structures

29.)The _____ member function reads raw binary data from a file. -
read

31.)In _____ file access, the contents of the file are read in the order they appear in the file, from the file's start to its end. -
sequential

33.)The _____ member function moves a file's read position to a specified byte in the file. -
seekg

35.)The _____ member function returns a file's current read position. -
tellg

37.)The _____ mode flag causes an offset to be calculated from the beginning of a file. -
ios::beg

39.)The _____ mode flag causes an offset to be calculated from the current position in the file. -
ios::cur

49.)T/F Different operating systems have different rules for naming files. -
TRUE

51.)T/F ofstream objects, by default, delete the contents of a file if it already exists when opened. -
TRUE

53.)T/F Several file access flags may be joined by using the | operator. -
TRUE

55.)T/F If a file is opened in the definition of the file stream object, no mode flags may be specified. -
FALSE

57.)T/F The same outpuT/Formatting techniques used with cout may also be used with file stream objects. -
TRUE

59.)T/F The getline member function can be used to read text that contains whitespaces. -
TRUE

61.)T/F Binary files contain unformatted data, not necessarily stored as text. -
TRUE

63.)T/F The tellp member function tells a file stream object which byte to move its write position to. -
FALSE

CHAPTER 13 WRITTEN:

1.)What is the difference between a class and an instance of the class? -

A class describes a data type.

An instance of a class is an object of the data type that exists in memory.

3.)What is the default access specification of class members -

Private

5.)A contractor uses a blueprint to build a set of identical houses. Are classes analogous to the blueprint or the houses? -

Blueprint -> Classes

Houses -> Objects

Classes are analogous to the blueprint where the objects created from the blueprints. The blueprint itself is a detailed description.

7.)Is it a good idea to make member variables private? why or why not? -

Yes, it protects variables from being directly manipulated by code outside of the class, and prevents them from receiving invalid data.

9.)Under what circumstances should a member function be private? -

When the function is needed for internal processing, but not useful to the program outside of the class.

11.)What is a de-constructor? Is it possible to have more than one constructor?

Destructor is a member function of the class that has same name of the class but preceded with a tilde (~) and is used to destroy the objects.

Yes, it's called Constructor Overloading.

13.)If a class object is dynamically allocated in memory, does its constructor execute? If so, when? -

Yes, executes when the object is created.

15.)What are a class's responsibilities? -

The class is responsible for knowing the action that the class is responsible for doing.

17.)The two common programming methods in practice today are _____ and _____.

Procedural Programming and Object-Oriented Programming

19.)_____ programming is centered around objects. -
Object-Oriented

21.)In C++ the _____ is the construct primarily used to create objects. -
Class

23.)An _____ is a key word inside a class declaration that establishes a member's accessibility. -
Access specifier

25.)The default access specification of a struct in C++ is _____.
Public

27.)Members of a class object may be accessed through a pointer to the object by using the _____ operator. -
->

29.)If you were writing the external definitions of the Canine class's member functions, you would save them in a file named? _____ -
Canine.cpp

31.)A _____ is automatically called when an object is created. -
Constructor

33.)_____ are useful for performing initialization or setup routines in a class object. -
Constructors

35.)A _____ constructor is one that requires no arguments. -
Default

37.)A destructor has the same name as the class, but is preceded by a _____ character. -
tilde (~)

39.)A constructor whose arguments all have default values is a _____ constructor. -
Default

41.)A class may only have one default _____ and one _____ -
Constructor and one Destructor

51.)Private members must be declared before public members. -
F

52.)Class members are private by default. -
T

53.)Member of a struct are private by default -
F

54.)Classes and structures in C++ are very similar -
T

55.)All private members of a class must be declared together. -
F

56.)All public members of a class must be declared together. -
F

57.)It is legal to define a pointer to a class object. -
T

58.)You can use the new operator to dynamically allocate an instance of a class. -
T

59.)A private member function may be called from a statement outside the class, as long as the statement is in the same program as the class declaration. -
F

60.)Constructors do not have to have the same name as the class -
F

61.)Constructors may not have a return type. -
T

62.)Constructors cannot take arguments. -
F

63.)Destructors cannot take arguments. -
T

64.)Destructors may return a value. -
F

65.)Constructors may have default arguments. -
T

66.)Member functions may be overloaded. -
T

67.)Constructors may not be overloaded. -
F

68.)A class may not have a constructor with no parameter list, and a constructor whose arguments all have default values. -
F

69.)A class may only have on destructor. -
T

70.)When an array of objects is defined, the constructor is only called for the first element. -
F

71.)To find the classes needed for an object-oriented application, you identify all of the verbs in a description of the problem domain. -
F

72.)A class's responsibilities are the things the class is responsible for knowing, and actions the class must perform. -
T