**Chapter 2**

**Checkpoint**

2.1The following C++ program will not compile because the lines have been mixed  
up.  
int main()  
}  
// A crazy mixed up program  
return 0;  
#include <iostream>  
cout << "In 1492 Columbus sailed the ocean blue.";  
{  
using namespace std;

When the lines are properly arranged the program should display the following  
on the screen:  
In 1492 Columbus sailed the ocean blue.

Rearrange the lines in the correct order. Test the program by entering it on the  
computer, compiling it, and running it.

// A crazy mixed up program  
#include <iostream>  
using namespace std;

int main()  
**{**

cout << "In 1492 Columbus sailed the ocean blue.";

**return 0;**

**}**

2.2The following C++ program will not compile because the lines have been mixed up.  
cout << "Success\n";  
cout << " Success\n\n";  
int main()  
cout << "Success";  
}  
  
using namespace std;  
// It's a mad, mad program  
#include <iostream>  
cout << "Success\n";  
{  
return 0;

When the lines are properly arranged the program should display the following  
on the screen:  
**Program Output**  
Success  
Success Success  
Success  
Rearrange the lines in the correct order. Test the program by entering it on the  
computer, compiling it, and running it.

// It's a mad, mad program  
#include <iostream>  
using namespace std;

int main()  
{

cout << "Success\n";  
cout << "Success";  
cout << "Success\n";  
cout << " Success\n\n";  
return 0;}

2.3Study the following program and show what it will print on the screen.  
// The Works of Wolfgang  
#include <iostream>  
using namespace std;  
int main()  
{  
cout << "The works of Wolfgang\ninclude the following";  
cout << "\nThe Turkish March" << endl;  
cout << "and Symphony No. 40 ";  
cout << "in G minor." << endl;  
return 0;  
}

The works of Wolfgang

include the following

The Turkish March

and Symphony No.40

in G minor.

2.4On paper, write a program that will display your name on the first line, your street  
address on the second line, your city, state, and ZIP code on the third line, and  
your telephone number on the fourth line. Place a comment with today’s date at  
the top of the program. Test your program by entering, compiling, and running it.

2.5Examine the following program.  
// This program uses variables and literals.  
#include <iostream>  
using namespace std;  
int main()  
{  
int little;  
int big;  
little = 2;  
big = 2000;  
cout << "The little number is " << little << endl;  
cout << "The big number is " << big << endl;  
return 0;  
}  
List all the variables and literals that appear in the program.

Variable : little, big.

Literal : 2, 2000, "The little number is ", "The big number is ".

2.6 What will the following program display on the screen?  
#include <iostream>  
using namespace std;  
int main()  
{  
int number;  
number = 712;  
cout << "The value is " << "number" << endl;  
return 0;  
}

The value is 712

2.7 Which of the following are illegal variable names, and why?  
X

99bottles = no, because there’s number at the beginning  
july97  
theSalesFigureForFiscalYear98  
r&d = no, because other than caps, lowercase, and underscore, other symbol is not allowed.  
grade\_report

2.8 Is the variable name Sales the same as sales ? Why or why not?

It’s not the same Uppercase and lowercase characters are distinct.

2.9 Refer to the data types listed in Table 2-6 for these questions.  
A)If a variable needs to hold numbers in the range 32 to 6,000, what data type  
would be best? unsigned short int

B)If a variable needs to hold numbers in the range -40,000 to 40,000, what  
data type would be best? long int

C)Which of the following literals uses more memory? 20 or20L

20L

2.10 On any computer, which data type uses more memory, an integer or an unsigned  
integer? They have same size.

number 65 is the code for A, 66 is the code for B, and so on

2.11What are the ASCII codes for the following characters? (Refer to Appendix B )  
C = 67  
F = 70  
W =

2.12Which of the following is a character literal?  
'B' = true  
"B" = false

2.13Assuming the char data type uses 1 byte of memory, how many bytes do the  
following literals use?  
'Q' = 1 byte  
"Q" = 2 byte  
"Sales" = 6 byte  
'\n' = 2 byte

2.14Write a program that has the following character variables: first, middle ,  
and last. Store your initials in these variables and then display them on the  
screen.

#include <iostream>

using namespace std;

int main()

{

char first, middle, last;

cin>>first

>>middle

>>last;

cout<<first<<”.”<<middle<<”.”<<last;

return 0;

}

2.15What is wrong with the following program statement?  
char letter = "Z";

It shouldn’t be “ ”, but ‘ ’.

2.16What header file must you include in order to use string objects?

#include <string>

2.17Write a program that stores your name, address, and phone number in three  
separate string objects. Display the contents of the string objects on the  
screen.

#include <iostream>

#include <string>

using namespace std;

int main()

{

string name, address, phone;

cin>>name

>>address

>>phone;

cout<<name<<endl<<address<<endl<<phone;

return 0;

}

2.18Yes or No: Is there an unsigned floating point data type? If so, what is it?

No.  
2.19How would the following number in scientific notation be represented in E notation?  
6.31 1017  
6.31E17

2.20Write a program that defines an integer variable namedage and a float  
variable namedweight. Store your age and weight, as literals, in the variables.  
The program should display these values on the screen in a manner similar to  
the following:  
**Program Output**  
My age is 26 and my weight is 180 pounds.  
(Feel free to lie to the computer about your age and your weight—  
it’ll never know!)

int namedage;

float namedweight;

cin>>namedage

>>namedweight;

Cout<<”My age is “<<namedage<<” and my weight is“<<namedweight<<” pounds.\n  
(Feel free to lie to the computer about your age and your weight—\n  
it’ll never know!)”;

return 0;

2.21Is the following assignment statement valid or invalid? If it is invalid, why?  
72 = amount;

It should be

amount = 72;

2.22How would you consolidate the following definitions into one statement?  
int x = 7, y = 16, z = 28;

2.23What is wrong with the following program? How would you correct it?  
#include <iostream>  
using namespace std;  
int main()  
{  
double number;

number = 62.7;  
//double number;  
cout << number << endl;  
return 0;  
}

2.24Is the following an example of integer division or floating-point division? What  
value will be stored in portion ?  
portion = 70 / 3;

Floating-point division

2.25Write statements using the const qualifier to create named constants for the  
following literal values:

**Literal ValueDescription**  
2.71828 Euler’s number (known in mathematics as*e* )  
5.256E5 Number of minutes in a year  
32.2 The gravitational acceleration constant (in feet per second2 )  
9.8 The gravitational acceleration constant (in meters per second2 )  
1609 Number of meters in a mile

const double E = 2.71828;

const double MIN\_IN\_YEAR = 5.256E5 ;

const double GRAVITY\_FEET\_PER\_SECOND2 = 32.2;

const double GRAVITY\_METER\_PER\_SECOND2 = 9.8;

const int METER\_IN\_MILE = 1609;

**Review Questions and Exercises**  
**Short Answer**

1.How many operands does each of the following types of operators require?  
\_single operand\_Unary  
\_two operand\_\_\_Binary  
\_three operand\_\_Ternary

2.How may the double variables temp, weight, and age be defined in one statement?

One.  
3.How may the int variables months, days, and years be defined in one statement,  
with months initialized to 2 andyears initialized to 3?

Two.  
4.Write assignment statements that perform the following operations with the variables  
a, b, and c .

A) Adds 2 to a and stores the result in b .

Int a = 2;

int b = a;  
B)Multiplies b times 4 and stores the result in a .

int a = b \* 4;

C)Divides a by 3.14 and stores the result in b .

D)Subtracts 8 from b and stores the result in a .

Int a = b / 8;  
E)Stores the value 27 in a.

int a = 27;

F)Stores the character ‘K’ in c .

Char c = ‘K’;

G)Stores the ASCII code for ‘B’ in c .

5.Is the following comment written using single-line or multi-line comment symbols?  
/\* This program was written by M. A. Codewriter\*/

Single-line comment

6.Is the following comment written using single-line or multi-line comment symbols?  
// This program was written by M. A. Codewriter

Multi-line comment

7.Modify the following program so it prints two blank lines between each line of text.  
#include <iostream>  
using namespace std;  
int main()  
{  
cout << "Two mandolins like creatures in the\n\n";  
cout << "dark\n\n";  
cout << "Creating the agony of ecstasy.\n\n";  
cout << " - George Barker\n\n";  
return 0;  
}

8.What will the following programs print on the screen?  
A)#include <iostream>  
using namespace std;  
int main()  
{  
int freeze = 32, boil = 212;  
freeze = 0;  
boil = 100;  
cout << freeze << endl << boil << endl;  
return 0;  
}

0

100

B)#include <iostream>  
using namespace std;  
int main()  
{  
int x = 0, y = 2;  
x = y \* 4;  
cout << x << endl << y << endl;  
return 0;  
}

8

2

C)#include <iostream>  
using namespace std;  
int main()  
{  
cout << "I am the incredible";  
cout << "computing\nmachine";  
cout << "\nand I will\namaze\n";  
cout << "you.";  
return 0;  
}

I am the incredible computing

machine

and I will

amaze

you

D)#include <iostream>  
using namespace std;  
int main()  
{  
cout << "Be careful\n";  
cout << "This might/n be a trick ";  
cout << "question\n";  
return 0;  
}

Be careful

This might

be a trick question

E)#include <iostream>  
using namespace std;  
int main()  
{  
int a, x = 23;  
a = x % 2;  
cout << x << endl << a << endl;  
return 0;  
}

23

1

**Multiple Choice**  
9.Every complete statement ends with a  
A)period  
B)# symbol  
C)semicolon  
D)ending brace  
10.Which of the following statements is correct?  
A)#include (iostream)  
B)#include {iostream}  
C)#include <iostream>  
D)#include [iostream]  
E)All of the above  
11.Every C++ program must have a  
A)cout statement  
B)functionmain  
C)#include statement  
D)All of the above  
12.Preprocessor directives begin with a  
A)#  
B)!  
C)<  
D)\*  
E)None of the above  
13.The following data  
72  
'A'  
"Hello World"  
2.8712  
are all examples of  
A) Variables  
B)Literals or constants  
C) Strings  
D)None of the above  
14.A group of statements, such as the contents of a function, is enclosed in  
A)Braces{}  
B)Parentheses()  
C)Brackets<>  
D)All of the above will do  
15.Which of the following are*not* valid assignment statements? (Circle all that apply.)  
A)total = 9;  
B)72 = amount;  
C)profit = 129  
D)letter = 'W';  
16.Which of the following are*not* validcout statements? (Circle all that apply.)  
A)cout << "Hello World";  
B)cout << "Have a nice day"\n;  
C)cout < value;  
D)cout << Programming is great fun;  
17.Assumew = 5,x = 4,y = 8, andz = 2. What value will be stored inresult in each of  
the following statements?  
A)result = x + y; = 12  
B)result = z \* 2; = 4  
C)result = y / x; = 2  
D)result = y − z; = 6  
E)result = w % 2; = 1  
18.How would each of the following numbers be represented in E notation?  
A)3.287 ×106  
B)−978.65 ×1012  
C)7.65491 ×10−3  
D)−58710.23 ×10−4  
19.The negation operator is  
A) Unary  
B) Binary  
C) Ternary  
D)None of the above  
20.A(n) \_\_\_\_\_\_\_\_\_\_\_ is like a variable, but its value is read-only and cannot be changed  
during the program’s execution.  
A)secure variable  
B)uninitialized variable  
C)named constant  
D)locked variable  
21.When do preprocessor directives execute?  
A)Before the compiler compiles your program  
B)After the compiler compiles your program  
C)At the same time as the compiler compiles your program  
D)None of the above

**True or False**  
22.T F A variable must be defined before it can be used.  
23.T F Variable names may begin with a number.  
24.T F Variable names may be up to 31 characters long.  
25.T FA left brace in a C++ program should always be followed by a right brace later  
in the program.  
26.T FYou cannot initialize a named constant that is declared with theconst modifier.

**Algorithm Workbench**

27.Convert the following pseudocode to C++ code. Be sure to define the appropriate  
variables.

Store 20 in the*speed* variable.  
Store 10 in the*time* variable.  
Multiply*speed* by time and store the result in the*distance* variable.  
Display the contents of the*distance* variable.

int main()

{

int speed = 20, time = 10;

int distance = speed \* time;

cout<<distance;

return 0;

}

28.Convert the following pseudocode to C++ code. Be sure to define the appropriate  
variables.  
Store 172.5 in the*force* variable.  
Store 27.5 in the*area* variable.  
Divide area by*force* and store the result in the*pressure* variable.  
Display the contents of the *pressure* variable.

int main()

{

float force = 172.5;

float area = 27.5;

float pressure = area / force;

cout<<pressure;

return 0;

}

**Find the Error**  
29.There are a number of syntax errors in the following program. Locate as many as  
you can.  
\*/ What's wrong with this program? /\*  
#include iostream  
using namespace std;

int main();  
}  
int a, b, c \\ Three integers  
a = 3  
b = 4  
c = a + b  
Cout < "The value of c is %d" < C;  
return 0;  
{

#include <iostream>  
using namespace std;

int main()  
{  
int a, b, c \\ Three integers  
a = 3;  
b = 4;  
c = a + b;  
cout << "The value of c is %d" << c;  
return 0;  
}