

Sheet 2

Short Answer

1. Assume that the following variables are defined:

```
int age;  
double pay;  
char section;
```

Write a single `cin` statement that will read input into each of these variables.

2. Assume a `string` object has been defined as follows:

```
string description;
```

- A) Write a `cin` statement that reads in a one-word string.
- B) Write a statement that reads in a string that can contain multiple words separated by blanks.

3. What header files must be included in the following program?

```
int main()  
{  
    double amount = 89.7;  
    cout << showpoint << fixed;  
    cout << setw(8) << amount << endl;  
    return 0;  
}
```

5. Write C++ expressions for the following algebraic expressions:

$$a = 12x$$

$$z = 5x + 14y + 6k$$

$$y = x^4$$

$$g = \frac{b + 12}{4k}$$

$$c = \frac{a^3}{b^2k^4}$$

6. Assume a program has the following variable definitions:

```
int units;  
float mass;  
double weight;
```

and the following statement:

```
weight = mass * units;
```

Which automatic data type conversion will take place?

- A) mass is demoted to an int, units remains an int, and the result of mass * units is an int.
- B) units is promoted to a float, mass remains a float, and the result of mass * units is a float.
- C) units is promoted to a float, mass remains a float, and the result of mass * units is a double.

7. Assume a program has the following variable definitions:

```
int a, b = 2;  
float c = 4.2;
```

and the following statement:

```
a = b * c;
```

What value will be stored in a?

- A) 8.4
- B) 8
- C) 0
- D) None of the above

Find the Errors

Each of the following programs has some errors. Locate as many as you can.

28. using namespace std;

```
int main ()
{
    double number1, number2, sum;

    Cout << "Enter a number: ";
    Cin << number1;
    Cout << "Enter another number: ";
    Cin << number2;
    number1 + number2 = sum;
    Cout "The sum of the two numbers is " << sum
    return 0;
}
```

29. #include <iostream>

```
using namespace std;

int main()
{
    int number1, number2;
    float quotient;
    cout << "Enter two numbers and I will divide\n";
    cout << "the first by the second for you.\n";
    cin >> number1, number2;
    quotient = float<static_cast>(number1) / number2;
    cout << quotient
    return 0;
}
```

30. #include <iostream>;

```
using namespace std;

int main()
{
    const int number1, number2, product;

    cout << "Enter two numbers and I will multiply\n";
    cout << "them for you.\n";
    cin >> number1 >> number2;
    product = number1 * number2;
    cout << product
    return 0;
}
```

```
31. #include <iostream>;
    using namespace std;

    main
    {
        int number1, number2;

        cout << "Enter two numbers and I will multiply\n"
        cout << "them by 50 for you.\n"
        cin >> number1 >> number2;
        number1 *= 50;
        number2 *= 50;
        cout << number1 << " " << number2;
        return 0;
    }
```

```
32. #include <iostream>;
    using namespace std;

    main
    {
        double number, half;

        cout << "Enter a number and I will divide it\n"
        cout << "in half for you.\n"
        cin >> number1;
        half = / 2;
        cout << fixedpoint << showpoint << half << endl;
        return 0;
    }
```

```
33. #include <iostream>;
    using namespace std;

    int main()
    {
        char name, go;

        cout << "Enter your name: ";
        getline >> name;
        cout << "Hi " << name << endl;
        return 0;
    }
```

predict the output:

```
35. #include <iostream>
    using namespace std;
    int main()
    {
        long x, y, z;

        x = y = z = 4;
        x += 2;
        y -= 1;
        z *= 3;
        cout << x << " " << y << " " << z << endl;
        return 0;
    }
```

36. *(Assume the user enters George Washington.)*

```
#include <iostream>
#include <iomanip>
#include <string>
using namespace std;

int main()
{
    string userInput;
    cout << "What is your name? ";
    getline(cin, userInput);
    cout << "Hello " << userInput << endl;
    return 0;
}
```

37. (Assume the user enters 36720152. Use a calculator.)

```
#include <iostream>
#include <iomanip>
using namespace std;

int main()
{
    long seconds;
    double minutes, hours, days, months, years;

    cout << "Enter the number of seconds that have\n";
    cout << "elapsed since some time in the past and\n";
    cout << "I will tell you how many minutes, hours,\n";
    cout << "days, months, and years have passed: ";
    cin >> seconds;

    minutes = seconds / 60;
    hours = minutes / 60;
    days = hours / 24;
    years = days / 365;
    months = years * 12;
    cout << setprecision(4) << fixed << showpoint << right;
    cout << "Minutes: " << setw(6) << minutes << endl;
    cout << "Hours: " << setw(6) << hours << endl;
    cout << "Days: " << setw(6) << days << endl;
    cout << "Months: " << setw(6) << months << endl;
    cout << "Years: " << setw(6) << years << endl;
    return 0;
}
```

write a cpp programs :

13. Currency

Write a program that will convert U.S. dollar amounts to Japanese yen and to euros, storing the conversion factors in the constants `YEN_PER_DOLLAR` and `EUROS_PER_DOLLAR`. To get the most up-to-date exchange rates, search the Internet using the term “currency exchange rate”. If you cannot find the most recent exchange rates, use the following:

1 Dollar = 98.93 Yen
1 Dollar = 0.74 Euros

Format your currency amounts in fixed-point notation, with two decimal places of precision, and be sure the decimal point is always displayed.

Programming Challenges

1. Miles per Gallon

Write a program that calculates a car's gas mileage. The program should ask the user to enter the number of gallons of gas the car can hold and the number of miles it can be driven on a full tank. It should then display the number of miles that may be driven per gallon of gas.

2. Stadium Seating

There are three seating categories at a stadium. For a softball game, Class A seats cost \$15, Class B seats cost \$12, and Class C seats cost \$9. Write a program that asks how many tickets for each class of seats were sold, then displays the amount of income generated from ticket sales. Format your dollar amount in fixed-point notation, with two decimal places of precision, and be sure the decimal point is always displayed.

3. Test Average

Write a program that asks for five test scores. The program should calculate the average test score and display it. The number displayed should be formatted in fixed-point notation, with one decimal point of precision.

4. Average Rainfall

Write a program that calculates the average rainfall for three months. The program should ask the user to enter the name of each month, such as June or July, and the amount of rain (in inches) that fell each month. The program should display a message similar to the following:

The average rainfall for June, July, and August is 6.72 inches.

5. Male and Female Percentages

Write a program that asks the user for the number of males and the number of females registered in a class. The program should display the percentage of males and females in the class.

Hint: Suppose there are 8 males and 12 females in a class. There are 20 students in the class. The percentage of males can be calculated as $8 \div 20 = 0.4$, or 40%. The percentage of females can be calculated as $12 \div 20 = 0.6$, or 60%.

17. Math Tutor

Write a program that can be used as a math tutor for a young student. The program should display two random numbers to be added, such as

$$\begin{array}{r} 247 \\ +129 \\ \hline \end{array}$$

The program should then pause while the student works on the problem. When the student is ready to check the answer, he or she can press a key and the program will display the correct solution:

$$\begin{array}{r} 247 \\ +129 \\ \hline 376 \end{array}$$