Objective:

- To get a review of taking input from keyboard, and basic concept of type coercion and type casting.
- Issues related to keyboard input stream.

Task-1:

Complete the following table by writing the value of each expression in the Value column according C++ language rules.

Expression	Value
28 / 4 – 2	
6 + 12 * 2 – 8	
4 + 8 * 2	
6 + 17 % 3 – 2	
2 + 22 * (9 - 7)	
(8 + 7) * 2	
(16 + 7) % 2 – 1	
12 / (10 - 6)	
(19 - 3) * (2 + 2) / 4	
5%10%3	

Task-3:

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.

Task-4:

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

Task-5:

Assume that qty and salesReps are both integers. Use a type cast expression to rewrite the following statement so it will no longer perform integer division.

```
unitsEach = qty / salesReps;
```

Task-6:

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

Program-1

```
using namespace std;
void  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
}
```

Program-2

```
#include <iostream>
using namespace std;
void 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;
        //In your book following syntax is used
        //quotient = float<static_cast>(number1) / number2;
        //but in class initially we shall use C Style type cast
        quotient = (float)number1 / number2;
        cout << quotient
}
```

Task-7: 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.

Task-8:
Suppose x and y are int variables and ch is a char variable. Consider the following input:
5 28 36
What value (if any) is assigned to x, y, and ch after each of the following statements executes? (Use the same input for each statement).

A. cin >> x >> y >> ch;
B. cin >> ch >> x >> y;
C. cin >> x >> ch >> y;
D. cin >> x >> y;
   cin.get(ch);

Task-9:
Suppose x and y are int variables and z is a double variable. Assume the following input data:
37 86.56 32
What value (if any) is assigned to x, y, and z after each of the following statements executes? (Use the same input for each statement.)

A. cin >> x >> y >> z;
B. cin >> x >> z >> y;
C. cin >> z >> x >> y;

Task-10:
Suppose x and y are int variables and ch is a char variable. Assume the following input data:
13 28 D
14 E 98
A B 56
What value (if any) is assigned to x, y, and ch after each of the following statements executes? (Use the same input for each statement.

A.
```
cin >> x >> y;
cin.ignore(50, '\n');
cin >> ch;
```
B.
```
cin >> x;
cin.ignore(50, '\n');
cin >> y;
cin.ignore(50, '\n');
cin.get(ch);
```
C.
```
cin >> y;
cin.ignore(50, '\n');
cin >> x >> ch;
```
D.
```
cin.get(ch);
cin.ignore(50, '\n');
cin >> x;
cin.ignore(50, 'E');
cin >> y;
```

Task-11:
Given the input:
46 A 49
and the C++ code:

```
int x = 10, y = 18;
char z = '*';
cin >> x >> y >> z;
cout << x << " " << y << " " << z << endl;
```
What is the output?

Task-12:
Suppose that age is an int variable and name is a C style string variable char name[50]. What are the values of age and name after the following input statements execute?
```
cin >> age;
cin.getline(name, 50);
```
if the input is:

A. 23 Lance Grant

OR the input is

B.
```
23
Lance Grant
```

Task-13:
During each summer, John and Jessica grow vegetables in their back yard and buy seeds and fertilizer from a local nursery. The nursery carries different types of vegetable fertilizers in various bag sizes. When buying a particular fertilizer, they want to know the price of the fertilizer per pound and the cost of fertilizing per square foot. The following program prompts the user to enter the size of the fertilizer bag, in pounds, the cost of the bag, and the area, in square feet, that can be covered by the bag. The program should output the desired result. However, the program contains logic errors. Find and correct the logic errors so that the program works properly.

```
//Logic errors.
#include <iostream>
#include <iomanip>
using namespace std;
void main()
{
        double cost;
```

```
        double area;
        double bagSize;
        cout << fixed << showpoint << setprecision(2);
        cout << "Enter the amount of fertilizer, in pounds, "<< "in one bag: ";
        cin >> bagSize;
        cout << endl;
        cout << "Enter the cost of the " << bagSize << " pound fertilizer bag: ";
        cin >> cost;
        cout << endl;
        cout << "Enter the area, in square feet, that can be "<< "fertilized by one bag: ";
        cin >> area;
        cout << endl;
        cout << "The cost of the fertilizer per pound is: $"<< bagSize / cost << endl;
        cout << "The cost of fertilizing per square foot is: $"<< area / cost << endl;
}
```

Task-14: 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 = 83.14 Yen
1 Dollar = 0.7337 Euros

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

Task-15: Monthly Payments

The monthly payment on a loan may be calculated by the following formula:

$$\text{Payment} = \frac{\text{Rate} * (1 + \text{Rate})^{N}}{((1 + \text{Rate})^{N} - 1)} * L$$

Rate is the monthly interest rate, which is the annual interest rate divided by 12.
(12% annual interest would be 1 percent monthly interest.) N is the number of payments and L is the amount of the loan. Write a program that asks for these values and displays a report similar to:

```
Loan Amount:                $ 10000.00
Monthly Interest Rate:              1%
Number of Payments:                36
Monthly Payment:            $   332.14
Amount Paid Back:           $ 11957.15
Interest Paid:              $  1957.15
```

Wahi hai saahib-e-imroz (today's master) jis ne apni mehnat se
Zamaane ke samundar se nikaala gohar-e-fardan (tomorrows pearl)

[- Dr Allama Muhammad Iqbal -]