Programming Exercises

1. Write a C++ program that converts US dollars to Canadian dollars. Here's the dialogue that should take place between the user and the machine when you run the program:
machine: *This program converts US dollars to Canadian dollars.*
machine: *Enter the amount in US dollars:*
user: *x*
machine: *x US dollars is equal to y Canadian dollars.*
NOTE: The program must handle ANY real value x as input, and output the correct converted amount. Look up the newspaper or the Web for the conversion rate.
2. Write a C++ program that asks when you are leaving for work and outputs an appropriate message, according to the following rules:
a. If leaving before 6, "Drive."
b. If leaving between 6 and 8, "Take a train."
c. If leaving after 8, "Take a bus."

3. Write a C++ *function* that takes four arguments, H, C, r1 and r2, where H is the total hours worked, r1 is the hourly pay if you worked less than or equal to C hours and r2 is the hourly pay for each hour above C. The function should return the net pay. Use this function in a program that asks for H, C, r1 and r2 as input and prints out the net pay.

4. Write a C++ program that asks the user "How many scores do you want to enter?". For any integer response n, the program should present n prompts of the form
"enter score 1:"
"enter score 2:"
.....
"enter score n:"
The program should read in the n values and give the average score. Remember, the program should work for any integer n.
5. Write a function that accepts one, two or three arguments of type double and outputs their sum. Use this function to write a program that asks the user to input *upto* three numbers, and prints out their sum. The program should include a loop that lets the user repeat this computation for new input values until the user wants to end the program.

6. Write a function with prototype *void fun(double)* that prints out an appropriate message depending on the user-eneterd temperature:
greater than 90 : "too hot"
75 to 89 : " hot"
60 to 74 : "mild"
35 to 60 : "chilly"
less than 35 : "cold"
What will happen if you entered a char for the temperature?
Now use function overloading to allow the user to input the temperature as well as a char, 'F' for Fahrenheit and 'C' for Celsius, and the function outputs the appropriate message.
7. Suppose the interest rate on a loan goes up .25% points each year. Write a function *rate(double& r)* that increments the interest rate for the next year. Use this function in a program that receives user input for the principal P, initial interest rate i and the loan period n and prints out the total due.
8. Consider the following program that gets three *int* values from the user and outputs them in ascending order. Write the required function prototypes and function definitions. Compile and run.

```
int main() {
int a,b,c;
PromptAndGet(a); //Get an int value, a,  from the user
PromptAndGet(b);
PromptAndGet(c);
SortAndPrint(a,b,c); // Sort the numbers in ascending order and print
             //Example:  ‘‘The numbers in ascending order are: 3, 7, 19’’

}
```

9. Write a C++ program that reads all the integers from a file "int.txt", stores them in an array called *myintarray*, and then prints the integers to the console in reverse order. (Hint: Use a for-loop on the array).

10. Create a text file containing integers, letters and whitespaces (remember that whitespaces include space, tab and newline characters). Write a C++ program that replaces each white space by * and writes the result to another text file. The program should work for arbitrary input file lengths.

11. Write a C++ program that changes the first letter of each word in an input sentence to upper case (if they are not already upper case) and prints a period at the end of the last word unless there is already a period there.

12. What is the following piece of code doing? Explain each line with a comment, indicating the values involved.

```
double *a, *b, m, n = 9.0;
b=&n;
m=n;
*b=34.9;
a=b;
cout<<*a<<endl;
cout<<*b<<endl;
```