Homework Week 5

1) Indicate which of the following functions are in error and why. Suggest

how you might correct the problems.

```
(a) int f() {
    string s;
    // . . .
    return s;
    }
(b) f2(int i) { /* . . . */ }
(c) int calc(int v1, int v1) /* . . . */ }
(d) double square(double x) return x * x;
```

2) Assuming T is the name of a type, explain the difference between a function declared as

```
void f(T)
```

and void f(T&)

3) Explain the behavior of the following function. If there are problems in the code, explain what they are and how you might fix them.

```
void print(const int ia[10])
{
    for (size_t i = 0; i != 10; ++i)
        cout << ia[i] << endl;
}
```

4) Given the following declarations, determine which calls are legal and which are illegal. For those that are illegal, explain why.

```
double calc(double);
int count(const string &, char);
int sum(vector<int>::iterator, vector<int>::iterator, int);
vector<int> vec(10);
(a) calc(23.4, 55.1);
(b) count("abcda", ’a’);
(c) calc(66);
(d) sum(vec.begin(), vec.end(), 3.8);
```

5) Write a function that will calculate all factors of an integer

```
function name: factor()
input: int n
output: a vector of integers with each element being a unique factor of n
```

6) Write a function that will calculate the GCD (greated common divisor) of two integers. Use factor() function defined in 5)

```
function name: gcd()
input: int a, int b
```

```
output: gcd of (a, b)
```

7) Write a function that determines whether an input integer is a prime or not.

```
function name: isPrime()
input: int
output: bool
```

8) Write a program that will produce a list of prime numbers that are less than a given input integer. Use isPrime() function in 7) if needed.

```
function name: prime_list()
input: int n
output: a list of prime numbers
```

Main program: prompt user to enter a number and store it as integer n.
Call prime_list() and print the list of primes on screen.