Object-Oriented Programming (List 6)

Due: April 28th 2010

1. Write a function

```cpp
std::vector< unsigned int > count_occurrences( std::vector< unsigned int > v, unsigned int x )
```

that counts how often \( x \) occurs in the vector \( v \).

2. Write a function

```cpp
unsigned int most_frequent( std::vector< unsigned int > v )
```

that returns an element of \( v \) that occurs most frequently. If \( v = \{1, 2, 1, 3\} \), the result is 1. If \( v = \{4, 5, 6, 7, 6\} \), the result must be 6. If \( v = \{4, 4, 5, 5\} \), the result can be either 4 or 5, because both of them occur two times.

3. Write a function

```cpp
double arithmetic_mean( std::vector< double > v )
```

that computes the arithmetic mean of the doubles in vector \( v \).

4. Write a function

```cpp
double standard_deviation( std::vector< double > v )
```

that computes the standard deviation of the double in vector \( v \). (Note that you need to compute the arithmetic mean first).

In case you forgot:

- \( v.\text{size}() \) : Length of vector.
- \( v.\text{push}\_\text{back}( i ) \) : Append \( i \) at the end of \( v \).
- \( v.\text{pop}\_\text{back}( ) \) : Remove last element from vector.
- \( v[i] \) : \( i \)-th element of vector.