CSCI 3333 Homework: Templates, Iterators, References (with Solutions)

1 Templates, Iterators, & References

Problem 1. Write a C++ function with header `void swap(float &x, float &y)` that swaps x and y.\(^1\)

Solution 1. `void swap(float &x, float &y)`

```cpp
    float tmp = x;
    x = y;
    y = tmp;
```

Problem 2. Write the same function as in Problem 1, but as a template function.

Solution 2. `template<typename T>
void swap(T &x, T &y)`

```cpp
    T tmp = x;
    x = y;
    y = tmp;
```

Problem 3. Write a C++ function named `print_all` that takes a reference to a `vector<string>` named V and returns nothing. The function should print the elements of the `vector`, one per line.

Solution 3. `void print_all(vector<string> &V)`

```cpp
    for (int i = 0; i < V.size(); ++i)
        cout << V[i] << endl;
```

Problem 4. Write the same function as in Problem 3, but using an iterator-based loop.

Solution 4. `void print_all(vector<string> &V)`

```cpp
    for (vector<string>::iterator it = V.begin(); it != V.end(); ++it)
        cout << *it << endl;
```

\(^1\)This function is also available in the `<algorithm>` library.
Problem 5. Write the same function as in Problem 3, but using a range-based for-loop.

Solution 5. void print_all(vector<string> &V)
{
    for (string &s : V)
        cout << s << endl;
}