forref.cpp

```cpp
/**
 * a program illustrating how to use references as aliases and
 * how to modifiy elements in a vector
 * @author Jon Beck
 * @version 14 January 2021
 */

#include <iostream>
#include <vector>
using namespace std;

/**
 * a simple function to print out the elements of a vector
 * on a single line
 * @param values the vector to print
 */
void print_vector(const vector<unsigned>& values);

int main()
{
  vector<unsigned> values {1, 2, 3, 4, 5};
  cout << "Values #0: ";
  print_vector(values);

  // try to modify using a foreach loop
  cout << "Values #1: ";
  for (auto value : values)
  {
    value *= 2;
  }

  print_vector(values);

  // modify each value using references in a foreach loop
  for (auto& value : values)
  {
    value *= 2;
  }

  cout << "Values #2: ";
  print_vector(values);

  // the pre-C++11 non-reference way to do it -- don't do this!
  for (vector<unsigned>::iterator itr {values.begin()};
                                       itr != values.end(); ++itr)
  {
    *itr *= 2;
  }
  cout << "Values #3: ";
  print_vector(values);

  return 0;
}

void print_vector(const vector<unsigned>& values)
{
  for (const auto& value : values)
  {
    cout << value << ' ';
  }
  cout << endl;
}
```