Quiz 3: Run time analysis

CS 14 - Data Structures

April 5, 2013

For each code snippet below, provide best and worst case run time analysis in terms of the size of the input vector. Additionally, determine what the function does when run on a container (either list or vector as appropriate) containing the following items:

$$1, 23, -1, 2, 6, -23, -23, 1, 1$$

Do not use a computer!

```
int prob1(const list<double> & v)
{
    int var=0;
    for (list<double>::iterator i=v.begin(); i<v.end(); i++) {
        if (*i<var) {
            var=*i;
        }
    }
    return var;
}
```

```
void prob2(vector<int> &v)
{
    for (vector<int>::iterator i=v.begin(); i!=v.end(); i++) {
        if (*i%2==1) {
            v.erase(j);
        }
    }
}
```

```
int prob3(const vector<int> & v)
{
    int outer = 0;

    for (int i=0; i<v.size(); i++) {
        for (int j=0; j<v.size(); j++) {
            int inner=0;

            for (int k=i; k<=j; k++)
                inner+=v[k];

            if (inner>outer)
                outer=inner;
        }
    }

    return outer;
}
```

The function prob3 is not as efficient as it could be. Write another version of the function that computes the same result, but takes asymptotically less time.