Homework 20

Due 11/30/16

November 22, 2016

Consider the following algorithm, which correctly solves the Bandersnatch (BS) problem using a solution to the JubJub (JJ) problem:

```
   Input: data: array of positive integers
   Input: n: size of data
   Output: Bandersnatch(data)
 1 Algorithm: BandersnatchReduction
 2 Sort data
 3 for i = 1 to n do
 4 |   if JubJub(data) then
 5 |   |   data[i] = data[n − i] − data[i]
 6 |   else
 7 |   |   data[i] = data[i] · data[n − i]
 8 |   end
 9 |   Sort data
10 end
11 return data
```

1. Suppose that BS is NP-Hard and JJ $\in P$. Prove that $P = NP$ *or* explain why BandersnatchReduction does not prove $P = NP$.

2. Suppose that BS $\in P$ and JJ is NP-Hard. Prove that $P = NP$ *or* explain why BandersnatchReduction does not prove $P = NP$.