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CSSE 373

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Exam 3 Turn in

Partitioning Trace:

Init state:

Name	Value
<Initial predicate>	State (num = 1)
array	<<-3, -1, -3>>
i	1
j	3
pc	"Lbl_1"
pivot	-2
returnValue	defaultInitValue

Final state:

<Action line 49, col 10 to line 5	State (num = 6)
array	<<-3, -3, -1>>
i	3
j	2
pc	"Done"
pivot	-2
returnValue	3

Not all the values to the left and including the return value are less than the pivot.

Fixed code:

```
if (i <= array.length -1 && array[i] == pivot) {
    return i;
}
return i - 1;
```

The new pivot is conditional if the pivot is in the array or not

Sorting:

Initial state

Name	Value
<Initial predicate>	State (num = 1)
array	<<-3, -2, -3>>
i	defaultInitValue
j	defaultInitValue
minIndex	defaultInitValue
pc	"Lbl_1"

Final state

<Action line 57, col 10 to	State (num = 8)
array	<<-3, -2, -3>>
i	3
j	3
minIndex	2
pc	"Done"

The array is not sorted in this instance

Fixed code

```
for (int i = j + 1; i <= array.length - 1; i++) {
    if (array[i] < array[minIndex])
        minIndex = i;
}
```

This inner for loop needed to change the condition from I < array.length -1 to I <= array.length -1

Yices:

```
Running command:'yices yices-module\FrenchWar.ys.refined' ...
sat
(= a 6)
(= i 0)
(= y 225)
(= c 7)

Running command:'yices yices-module\FrenchWar.ys.refined' ...
sat
(= a 8)
(= i 0)
(= y 235)
(= c 5)

Running command:'yices yices-module\FrenchWar.ys.refined' ...
unsat

Total Iterations: 26
SAT: true
Optimum: true
Best Result: {a=8, c=5, i=0, y=235}
```

1. How many Horsemen did you use per Cavalry set?
   5 horsemen
2. How many Archers did you use per Archer set?
   8 archers
3. How many Soldiers did you use per Infantry set?
   0 soldiers
4. How many Frenchmen did you kill in the war?
   235 Frenchmen