Henry Chang, SATbrute, Feb 22nd
The SATbrute solves the 3SAT problem by enumerating all the variable values and test the statement's boolean outcomes with those value sets. If there is a set of variable values that satisfy the statement, then the statement is satisfiable; otherwise, it is unsatisfiable.

To test the validity of the program, we run it on benchmark problems and a hand-generated problem. The result on testing SATbrute.java on satisfiable benchmark problems from https://www.cs.ubc.ca/~hoos/SATLIB/benchm.html is:

.cnf input File	Satisfiable
uf20-099	Y
uf20-01	Y
uf20-05	Y
uf20-0486	Y
uf20-0704	Y
uf20-0707	Y
uf20-0745	Y
uf20-0798	Y
uf20-0822	Y

To see that SATbrute also yields unsatisfiable, I generated the unsatisfiable uuf1-1.cnf file:
********(start of file)
c
p cnf 1 2
1 1 0
-1 -1 0
*********(enf of file)
The program did return that uuf1-1 is unsatisfiable.

Since the SATbrute.java gives the same result as the benchmark and the generated problems, I am confident that it is functioning correctly.

To see the growth of runtime, we generate input files of different input sizes with the python package CNFgen (command randk cnf). For simplicity, I set m=5n or 4n, however it may be problematic.

n variables	m clauses	Unsatisfiable Runtime(ms)
5	25	<1
10	50	4
15	75	85
20	100	2337
22	110	9338
25	125	87436

We could see the runtime grows exponentially(vaguely).for unsatisfiable 3SATs.

n variables	m clauses	Satisfiable Runtime(ms)
5	20	<1
10	40	<1
15	60	31
20	80	823
22	88	1875
25	100	31180

We could see the runtime grows exponentially(vaguely).for satisfiable 3SATs.

In these preliminary results, we see that the runtime of bruteSAT on 3SAT problem grows exponentially(by observation), and the runtimes for satisfiable problems are in general bounded by those of unsatisfactory ones with the same variable size. However, through the testing I noticed the relation between m and n affects the results and the chance of the statement being satisfiable. Thus, more detailed testings is needed for in order to understand the full nature of my algorithm and the 3SAT problem.