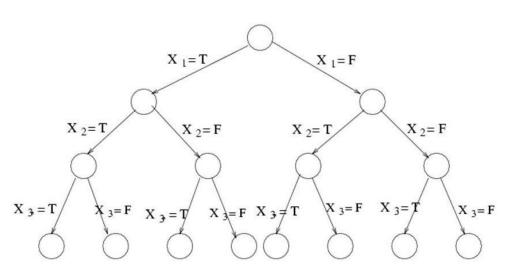
SAT Solver - Variant 2

Lukas Kaas Andersen

What is it?

- Aims to solve the boolean satisfiability problem
- Determines whether a Boolean
 Formula (CNF) can be satisfied
 with boolean assignments
- NP-Complete Nondeterministic polynomial time complete



https://medium.com/introduction-to-knowlegde-representation/propositional-logic-and-sat-problems-c0a3edac6a26

Conjunctive Normal Form (CNF)

Literals: Variable or its Negation

```
○ X, -X
```

Clauses: Disjunction of Literals

```
 x V -y
```

Conjunction (AND): A conjunction of clauses forming a CNF

```
\circ (x V y) \wedge (-x V y V z)
```

DPLL Algorithm

- David-Putman-Logemann-Loveland, names of researchers
- Algorithm for solving SAT
- Depth First Search, operates in CNF
- Decide (Variable and it's Value), Deduce (Unit Clause), Resolve Conflict(Backtracking)

Variant 2 - Tuned to Randomly Generate imbalance Instances

- Variables in input CNF will appear more often in either polarity,
 different for each variable
- For examples:
 - x appears a lot more often than -x, and -y appears a lot more often than y
 in CNF Formula

Next Steps

- Fully solidify my understanding of DPLL and SAT concepts, such as backtracking, decision heuristics and conflict resolution
- Plan requirements and design for my solver
- Decide on techniques I will use
- Decide what technologies I would like to use
- Prepare to begin coding

Gantt Chart

ID	ID	Name	Start Date :	End Date		Jan, 24		Feb, 24			M	Mar, 24			Apr, 24			May, 24			Jun, 24			Jul, 24				Aug, 2	4			
	vanie	Start Date	End Date		01 07	7 14	21	28 (04 11	18	25 0	3 10	17	24	31 0	7 14	21	28	05	12 19	9 26	02	09	16 23	30	07	14 21	28	04	11 1	18	
	1	Initial Reading/Research	Jan 12, 2024	Feb 05, 2024	1																											
	2	Decide on Technology to be Used	Feb 05, 2024	Feb 27, 2024	1																											
	3	Plan Structure of the System and What Techniques to be Used	Feb 05, 2024	Feb 27, 2024	1																											
	4	Code	Feb 27, 2024	Jun 17, 2024																271		100										
	5	Write Preliminary Project Report	Apr 01, 2024	Apr 22, 2024																												
	6	Write Final Report	Jun 17, 2024	Aug 06, 2024	1																											
	7	Create Video	Aug 01, 2024	Aug 08, 2024	1																											