John Deere is well known as a company that uses data strategically ─ from customer service to product design manufacturing, and  from optimizing supplier and dealer networks to understanding market potential and anticipating demand.

In the construction industry, machine uptime is the most critical factor to ensure maximum productivity, while keeping operating costs low. Most of John Deere’s construction machinery is equipped with telematics software that records machine behavior, including location, utilization hours, idle time, temperatures, fault codes, and fuel consumption. The data is streamed to the Cloud in real-time and from there to the monitoring system installed at the local dealership, as well as to John Deere’s [Machine Health Monitoring Center](https://www.deere.com/en/construction/construction-technology/machine-health/) located in the Dubuque Works Factory in Iowa.

Having the monitoring system at the dealership helps dealers provide faster and more efficient support to their customers. Dealers can use the recording of the machine to diagnose the machine problem remotely, so that the technician can bring the right parts to service the machine and fix it in one trip.

**Using Location Intelligence for market development**

John Deere equipment is sold to distributors, dealers, and associated companies for resale around the world. Most of the John Deere dealerships are independently owned. Using Location Technology, the Market Research Group at John Deere delivers market intelligence to Deere’s Dealer Development office, whose professionals advise dealers with data-driven investment predictions.

Take the example of a farm equipment dealership. To accurately predict the commercial value of a potential retail area, AI-powered analysis is conducted by looking at other currently active markets with similar characteristics of land cover, customer sales, and demographics, and projecting potential revenue for the new area based on past performance. These insights allow dealers to see opportunities at a granular level, boosting the odds of dealer success.

Other variables used when selecting probable locations for retail sites are, for instance, if the site can be easily accessed by target customers (such as those in big farm areas) and whether the site is within comfortable proximity to direct competitors. The data can also be used to decide which products to stock and which to be made visible from the road.

John Deere also uses Location Intelligence for its online and direct mail marketing campaigns. For example, homes with a few acres of grass are targeted with high-end lawnmower or small utility tractor promotions.

By providing continuous support and working closely with its dealerships, John Deere has created a healthy retail network with worldwide annual revenue of USD 37 billion.

## Use of Data Analytics in John Deere

* Analyzing machine’s real-time behavior data on a daily basis, including location, utilization hours, idle time, temperatures, fault codes, and fuel consumption can help detect anomalies quickly and before major problems occur.
* In case of any problems reported, dealers can use the recording of the machine data to diagnose the problem remotely, so that the technician can bring the right parts to service the machine and fix it in one trip.
* Advanced data analytics tools detect patterns that match a machine problem or any other failure. In case the same pattern is detected in other machines, preventive actions can be taken straightaway.
* Location Analytics help deliver market intelligence to advise dealers with data-driven investment predictions and market development strategies.
* Blue River Technology - Pioneer in the use of computer vision and robotics for agriculture bringing crop protection into the digital era with see and spray machines that precisely observe and treat each plant in the field

Bear flag robotics

On a broad scale, you can mention how you notice that there are different schools of thought and ways implemented to produce something, to solve a problem.

STAR: Situation, Task, Action, Result

Tell me about your resume:

Hello, my name is James Shen, and I am a third year computer science major at the University of Florida. I really enjoy learning, I have been a high-achieving student all my life, throughout high school and college, I have a full ride scholarship at UF. I love the courses I have taken – two of my favorite courses have been Data Structures and Algorithms, as well as Statistics…. \*Why you like Statistics, fascinating that we can draw probability-based conclusions, rather than qualitatively saying, “I think there is a correlation here,” we can back it up with hard quantitative evidence, using normality of the population as a foundation of the mathematics. Statistics is an important part of computer vision, which I know John Deere is innovating in with Blue River technology. \*Why you like data structures and algorithms \*what do you do to hone technical skills in your free time, I participate in programming contests, mention that.

How do you face a challenge:

I am not the type of person to shy away from challenges. In fact, I actively seek out challenges. If I find a class that is interesting, I will take it despite it having a reputation of it being very difficult. I don’t like to take the easy way, take cookie-cutter classes just for the required credit hours for the degree and get it over with. I prefer to expand my horizons and learn as much new information as possible, I am fascinated by many topics.

Describe how I solve a challenging problem. I break it down using divide and conquer methodology.

Why John Deere:

For the longest time I thought John Deere specialized in lawncare equipment or excavation. My dad had a riding lawnmower from John Deere at our old house, before we moved to an apartment and stopped having to do yardwork. After doing some research about John Deere, I realized that it was an agricultural company. Without agricultural revolution, still in the stone age. Agriculture is the foundation of society, and John Deere has numerous innovations in agriculture, including Blue River computer vision farming, smart machines that send feedback to clouds, there is so much with John Deere. John Deere has made many moves in acquiring technology such as Blue River Technologies and Bear Flag Robotics, driving the next generation of tech-assisted agriculture.

EXPLAIN STEP-BY-STEP HOW YOU SOLVE A PROBLEM! GIVE ANALYSIS-TYPE QUESTIONS

SAY HOW YOU ARE METHODICAL IN WRITING SCRIPTS, I MAKE SURE EACH LINE OF CODE I WRITE IS WHAT I INTEND ON DOING, A MINI-AGILE METHODOLOGY, MAKE SURE I AM EXTRACTING DATA CORRECTLY AND THERE IS NO CORRUPTION WITH THE DATA (USE PYTHON INSTEAD OF EXCEL FOR LARGE DATA FILES), MAKE SURE I HAVE RIGHT TOOLS FOR THE JOB (e.g. WOULD NOT USE EXCEL FOR HUGE DATASETS), METICULOUS WITH MY CODE, MAKE SURE THE T IN TRANSFORM IS DONE CORRECTLY, THEN LOAD IT CORRECTLY, WRITING IT IN THE FORMAT THE MENTOR WANTS, I MAKE SURE TO COMMUNICATE EXCESSIVELY IF I AM NOT SURE WHAT I NEED TO EXACTLY DO, I ASK FOR WHAT FORMAT HE WANTS IT IN, I THINK MORE COMMUNICATION IS BETTER THAN LESS COMMUNICATION

Explain XOR decryption question and use statistical analysis heuristic, explain thought process, is this brute forceable? All steps! Then draft some pseudocode, then after I think through it multiple times, I write the code. What tools do I need, which variables, some for loops, do I need to nest them, what is the expected runtime, is brute force good enough?

THINK OF POSSIBLE IMPROVEMENTS, IS THE HEURISTIC GOOD ENOUGH? (MOST COMMON WORD GETS 100 POINTS, LESS COMMON WORDS GET 1 POINT), MAYBE GET A LARGER LIST OF ENGLISH WORDS, AND IF THE WORD IS LONGER BUT STILL FOUND, THERE IS A GREAT CHANCE THAT THEY KEY IS CORRECT, SINCE DIFFICULT TO MAKE A LONG CORRECT ENGLISH WORD BY CHANCE, MAYBE LONGER WORDS GET MUCH MORE POINTS, IN THIS WAY THERE WOULD BE A CLEAR-CUT WINNER.

Describe a situation in which you were able to use persuasion to successfully convince someone to see things your way.

Different interpretations, different ways to do things, see things, this happens in music all the time. When I took piano lessons, I would be curious and try to persuade my piano teacher to allow me to play the piece in this certain way, why can’t I do this in this certain way, maybe slow the tempo down a little in the particular measure, I would be interested in exploring new ways to play the piece, solve the problem of interpretation. I had my own ideas, but I knew that my piano teacher has the say in things and is an expert in music.

MATLAB project group leader Linear Algebra summer course. USE STAR METHOD! Situation, task, advice, result.

Convinced my classmate at the University of Florida to participate in programming contests such as LeetCode weekly evening contests with me to improve both of our technical implementation skills. It took me a whole semester to convince him to participate in the contests! ….

My friend Mike from the University of Florida… anecdote, story, persuade him to join weekly contests with me.

What do I do in my free time?

Coding contests. I like to hone my technical skills so that they can be sharp when I need them in my research, in my school assignments, and on the job. I want to write the best code I can write, so I spend my time on LeetCode and Project Euler. I train my thinking skills, and I also like to train physically. So between coding sessions, I like to get some fresh air outside and play tennis, go to the gym and lift.

Describe a time when you were faced with a stressful situation that demonstrated your coping skills.

Piano competition, learned to deal with stress, accustomed with fight or flight symptoms, physical symptoms such as sweaty palms, queasy stomach, shaking arms. “Anxiety is a natural and healthy response to the worrying things that life can throw at you, tied to our time spent as hunter-gatherers.” I found that playing music is a good all-around teaching tool, it gave me opportunities to participate and become accustomed to stressful activities such as performing in front of audiences and judges at recitals and competitions and learning how to deal with stress. Too much stress, being too tight is detrimental to performing piano, so I developed routines and rituals as comfort. Practice makes perfect, so practicing in a certain way, preparing for the big day makes handling the stressful situation much more predictable and foreseeable. When I am faced with a stressful situation, I know that I have prepared enough and that I am ready to deal with the situation, I am confident.

STAR: Situation: Haha, yes, I have had to cope in stressful situations. Many of my memorable stressful situations were performances. I learned classical piano in my childhood and all throughout high school, and performed in piano recitals and even piano competitions in front of judges and parents. I had a lot of anxiety, I was terrified of making a mistake when I played, so I had sweaty palms, butterflies in my stomach, etc. My adrenaline was at its highest in my first few recitals, but I realized that the physical symptoms of anxiety are normal. The fight or flight response is a remnant of dangerous instinct of primal times, but now, instead of being chased by a lion, it is something more predictable, something that I can prepare for. Piano competitions, interviews, are much less unpredictable, and I can simulate them and prepare for them until I am comfortable. I go through my own practice routines and rituals until I feel confident, and when the big day comes, I feel less stressed and am able to focus on the task at hand.

Give me a specific example of a time when you used good judgment and logic in solving a problem.

*Project Euler decipher XOR code? Heuristic. Did runtime analysis of total number of operations. Project Euler poker hands .txt file parsing whitespace and newline characters, and then ad hoc, greedy logic to see who wins. Separate it into casework, different cases. If one hand is clearly better than the other (higher tier), then clear win. Otherwise, if same rank, then go into a tiebreaker, see who has the better high card, better flush, etc.*

Give me an example of a time when you set a goal and were able to meet or achieve it.

At the beginning of last summer, I set a goal to improve my programming skills. I noticed that the competitive programming niche was skilled, and that it is a useful hobby to compete it, so I took part in weekly contests ….

Tell me about a time when you had to use your presentation skills to influence someone's opinion.

\*Should be a presentation to a parent, teacher, boss (aka a higher up with more authority than me)\*

\* Think of a time when you had to change the opinion of a staunch supporter of something

I presented in science fairs in high school. Richmond METRO science fair

Give me a specific example of a time when you had to conform to a policy with which you did not agree.

Freshman on tennis team must get the water for the team, walk far, all the way to the shed, carry it back, it was heavy, I didn’t agree with the policy since I thought it was unfair, but I contemplated on it, and changed my mind. I realized that the purpose was not to inconvenience me or to humiliate me, but to show the newcomers to the team that discipline is needed for success. There are long days of practices, they suck some days, I had to carry the water, but the culture and system is designed to show rookies how a well-oiled team functions! Show discipline, respect, to senior players.

Freshman carrying water.

Please discuss an important written document you were required to complete.

Over the summer, I took a technical writing course… research report, project proposal.

Tell me about a time when you had to go above and beyond the call of duty in order to get a job done.

Tell me about a time when you had too many things to do and you were required to prioritize your tasks.

Quit piano after high school, or plan to go to a social event, but change my plans if something important comes up. I am close with my group of friends, so they understand that when I flake, it’s worth it. I had signed up for a tennis tournament for Club tennis at the University of Florida, but when I have a lot of assignments to do, or if I am in the middle of an extremely enthralling code question, I prefer to just cancel my participation in the tennis tournament. After all, I am a full-time student, not a college student-athlete, so I know what is a hobby and what is priority.

Give me an example of a time when you had to make a split-second decision.

I like to spend a lot of time to make a decision, so I can analyze the problem and plan ahead.

Returning a tennis serve? Cannot choke up and hesitate, must react quickly and trust my twitch instinct, practiced returning serves many times, have to trust a smooth racquet swing return motion. Hit with instinct!

What is your typical way of dealing with conflict? Give me an example.

I tend to avoid conflict, but when conflict arises, such as a disagreement about what the best course of action is, I tend to provide empirical evidence, hard quantitative measures as evidence, I think that talking and persuasion can only go so far. Such as arguments about which algorithm is better, my peers and I would solve the same LeetCode problem, we would discuss about who’s is better and whatnot, bring in the empirical runtime arguments.

I tend to avoid conflicts. If there is a conflict, I tend to try to resolve it immediately since letting the conflict drag on can make the situation worse. If still there is conflict, we reach a compromise.

Tell me about a time you were able to successfully deal with another person even when that individual may not have personally liked you (or vice versa).

*I tend to get along with anyone, and people generally get along with me. I find that a lot of initial dislike between people are first impressions. Walked on to football team, conflict, etc. Inclusion.*

Tell me about a difficult decision you've made in the last year

I quit piano, I really liked playing piano, I was an advanced classical piano player, participated in piano recitals and competitions.

Give me an example of a time when something you tried to accomplish and failed.

Top 6 in tennis team, I kept trying… THEN SUCCEEDED!

Give me an example of when you showed initiative and took the lead.

Summer course computational linear algebra, I was the group leader for all of the projects. I led a team of six classmates to complete the assignments. We had to write code in MATLAB to solve matrix problems, such as finding eigenvalues,

Tell me about a recent situation in which you had to deal with a very upset customer or coworker.

Yes, I have had experiences with upset customers. I worked at Chick-fil-A as a summer job in high school. I had encounters with upset customers who expressed their anger and disappointment towards me, they were unhappy with their order, or the service was too slow/line was too long, and at first I was flustered, but I learned to not be affected by unhappy customers, they might be in a rush, they might have had a bad day, so I sympathized with them and tried to fix their issues. My Pleasure Machine!

Give me an example of a time when you motivated others.

Motivate others all the time when going to the gym, motivate/persuade others to join programming contests as problem-solving practice

Tell me about a time when you delegated a project effectively.

Moving large pieces of furniture upstairs, knowing my own limits, deciding on not moving the larger piece of furniture, heavier, riskier, let professionals take it from there.

Give me an example of a time when you used your fact-finding skills to solve a problem.

I think I am good at finding the information I need to solve a complex problem. \*Finding syntax for new Python programming language, reading documentation to see what the arguments of the function are, what arguments a method can make, common syntax shortcuts in Python (list comprehension), when I learn something, I think I learn it well.

Tell me about a time when you missed an obvious solution to a problem.

Describe a time when you anticipated potential problems and developed preventive measures.

I notice the previous mistakes I usually make when I write programs, and I take not just mental notes of them, but I write them down in a particular notebook of mine. I am very meticulous and aware of my tendencies, so I review the mistakes I usually make, and tell myself not to make the same mistakes before starting a problem. While doing the problem, I write comments in my own code to keep track of what I am doing, and set up try/expect blocks in code to avoid mysterious bugs that are hard to track down.

Tell me about a time when you were forced to make an unpopular decision.

As a group leader in MAS3114, I made sure my group was productive and our output was perfect. We were almost done with the project, but one of my group members was struggling with his part of the assignment and had not finished it. I decided that he had to finish it over the weekend, rather than wait until Monday and rush to finish it. I don’t enjoy rushing to get things together, so I asked the group member to work on it over the weekend. This was not a popular request, so to persuade the others I compromised. I offered to get on Zoom with him one-on-one to finish the assignment, and help him with debugging his part of the code.

Describe a time when you set your sights too high (or too low).