**HR**

What is the importance of technology to JP Morgan?

* 2 billion spent on security, cybersecurity
* First bank to use ATMs and online imaging to process checks
* Dana Deasy talk – fintech, blockchain, etc. JPMorgan partners with fintech companies
* Retail has done well, need to focus on wholesale
* Electronic trading: Mobile trading apps like Robinhood, TD Ameritrade, acorns
* JPMorgan has artificial intelligence programme LOXM which takes signals from the market
* AI and Machine learning will make it faster and cheaper to process trades

How would you improve the technology in your life?

* More stuff like IFTTT free web based service the creates chains of simple conditional statements called applets
* Automate web application tasks
* If my alarm goes off, turn on the lights and send me the weather
* If I’m tagged on Facebook in a photo, then have it automatically back up to my iOS photos album
* Track work hours

Why you want to work as a software developer in a bank?

* Exciting, get to see it all happen, work close to your client, the traders
* Get to see the impact your making
* Want to be at JPMorgan specifically
* Technology for Social Good
* Diversity, all star code mentor program
* Bring your sons and daughters to work day
* WIN, BRG’s

Discuss a recent technological move by Chase?

* Talked about the move to Cloud Computing.
* Made preliminary approach to acquire U.K. payments business Worldpay Group, potentially making one of the biggest deals for a U.S. bank since the financial crisis.
* Fintech Worldpay market value of 8.2 billion
* Tech culture, Hudson Yards Office, hiring more tech people, especially young people
* Brooklyn café
* Not about looking cool, but creating an innovative culture and drawing in talent

How do you work in a group setting?

walk my interviewer through my resume

What is your greatest achievement in past year?

* SIBA and Music Matters (Lil Yachty, 2 Chainz, Panda)
* Raised 10 thousand alone

Name a time in which you went above and beyond what was asked of you.

Name something you do outside of work and school (a hobby) that would tie in to working at Chase.

* Traveling. When you travel you interact with people of different races and ideologies, you gain greater understanding of them. You build a relationship. In the same way dealing with client can be similar.
* Photography

What would you do if you or your team found a major bug in the feature/product you produced right before your have to demo it to clients?

What do you hope to accomplishing in your first 30 days here?

How well you work with teams, any team projects which you took the lead on, your interpersonal skills

what would you do if you were being under utilized on a team? how would you handle it?

How do you stay up to date on current events, both in technology and the economy?

* Morning emails like the Skimm, Morning Brew
* Cnet, TheVerge, TechCrunch
* Bloomberg, business insider, CNN Money
* WSJ, NYT pay wall
* Podcasts

"Name a time you paid too much attention to detail." followed by "Name a time you didn't pay enough attention to detail" "Name a time you contributed to a group" ect. Probably rapid fired about 6 of those in 45 minutes and I was struggling to think of more examples.

Tell me a joke...

* Why do Java developers wear glasses? Because they can't C#

What are you most proud of?

Describe a mistake you have made.

HR  
1) WHY JPMC?!(Most important)  
2)What Type of people do you hate?  
3) If 15 people from different regions are in one team and they have different ideas for a situation, how would you deal with it?  
4) How do finance and technology go hand in hand  
5) How does the bank earn?

* Fees (overdraft charges to advising companies on mergers, Forever 21 transaction deal from Wells Fargo), trading revenues, interest , traditional deposits and lending
* Chase retail side: retail deposits, loans, credit card and auto lending etc.
* Investment banking: Advising companies on mergers and acquisitions
* Asset management: Managing other peoples money and treasury services

6) If JPMC never sells the product, how is it the largest bank in USA?

One achievement in my life that I can boast about..

What is your greatest weakness.

Describe a time when you have had to think on your feet?

You a glass bottle with a message inside. How would you read the message without taking out the bottle cork or breaking the bottle glass?

* Simply push the cork into the bottle and shake the coin out.

Why did I chose the financial sector for a job?

Toughest challenge faces the financial sector today?

* Keeping up with customer wants (rewards, instant access, personalized experience, etc.)
* Uncertainty with Brexit on US financial institutions
* Cybersecurity

Describe a time you had a conflict with someone over a project and how was it resolved.

Do you know what an IPO is?" (Initial Public Offering)

Which technology do you like? and what would that bring to JP Morgan?

Describe a time you worked with a difficult team member and how you handled it.

**Tech**

Reverse a linked list.

* Linked list definition: a **linked list** is a linear collection of data elements, in which linear order is not given by their physical placement in memory. Each pointing to the next node by means of a [pointer](https://en.wikipedia.org/wiki/Pointer_(computer_programming)). It is a [data structure](https://en.wikipedia.org/wiki/Data_structure) consisting of a group of [nodes](https://en.wikipedia.org/wiki/Node_(computer_science)) which together represent a [sequence](https://en.wikipedia.org/wiki/Sequence). Under the simplest form, each node is composed of data and a [reference](https://en.wikipedia.org/wiki/Reference_(computer_science)) (in other words, a *link*) to the next node in the sequence. This structure allows for efficient insertion or removal of elements from any position in the sequence during iteration.
* <http://algorithms.tutorialhorizon.com/reverse-a-linked-list/>

How would you go about finding a loop in a linked list?

* You can make use of [**Floyd's cycle-finding algorithm**](http://en.wikipedia.org/wiki/Cycle_detection#Tortoise_and_hare), also known as *tortoise and hare algorithm*.  
  The idea is to have two references to the list and move them at **different speeds**. Move one forward by 1 node and the other by 2 nodes.
* If the linked list has a loop they will *definitely* meet.
* Else either of the two references(or their next) will become null.

Given a 7 day prediction of a single stock price, write an algorithm to maximize posits from buying/selling given a daily investment cap.

Given an array with stock closings, how would you determine a buy time and sell time such that profit is maximized.

Given an nxm matrix of integers and unlimited physical resources ( memory, processor speed), write a fast algorithm to calculate the sum of all matrix members.

How do you initialize a list of 20 empty strings in Python.

I answered with:  
  
empties = []  
for i in range(20):  
     empties.append("")  
  
They were looking for:  
  
empties = [""] \* 20

Describe the difference between agile vs waterfall

Waterfall emphasizes continuously moving forward. Not as flexible as Agile in terms of changing specs mid-development. Does not allow going back to fix bug/change specs. Agile is more flexible and welcoming of change. Good communication is necessary between developers and clients across all level of the project for Agile to work.

How is https more secure than http

* secure version of http
* communication between browser and website is encrypted
* HTTPS pages typically use one of two secure protocols to encrypt communications - [SSL (Secure Sockets Layer)](https://www.instantssl.com/ssl.html) or TLS (Transport Layer Security)
* Uses keys to encrypt communications

Graph traversal

* Issue with redundancy, computation time increases, don’t want to revisit and identify same vertex repeatedly
* Breadth first graph search

What is a hash map?

* When you use lists and you are looking for a special item you normally have to iterate over the complete list. This is very expensive when you have large lists.  
  A hashtable can be a lot faster, under best circumstances you will get the item you are looking for with only one access.
* A collision happens when two different items get the same hashcode.
* A **HashMap** is basically an array with lots of numbers, and the key lets you identify which value in that array or map of values to use.

Hashing elements of a list

* In python: So you can get hash of tuple and frozenset since the are immutable, and you can't do it for list and set because they are mutable.

Scripting in Unix and Create Server in UNIX.

* Basic Unix commands <https://www.tjhsst.edu/~dhyatt/superap/unixcmd.html>
  + Ls, cd, mkdir, grep

Difference between Java and Javascript and what a hash table is, java vs python

* Java OOP programming language – creates apps
* Javascript OOP scripting language – code run in browser
* Hash table – associative array data type, structure maps keys to values. Ex) Python dictionary
* Java static typing: define variable type when you first declare it, curly braces, portable, create platform independent applications
* Python: dynamic typing, indentation, more productive, concise, less lines of code
* Both python and java are strong type

Implement an algorithm in code on paper to sort list of integers. Try to be as efficient as possible.

Sorted() built in function

sorted([5, 2, 3, 1, 4])

[1, 2, 3, 4, 5]

Do this over sort() list method so that it doesn’t modify the original list

Diff between abstract and interface

* **Abstract class can extend only one class or one abstract class at a time**
* **Interface can extend any number of interfaces at a time**
* **Abstract class can be inherited by a class or an abstract class**
* **Interfaces can be extended only by interfaces. Classes has to implement them instead of extend**
* Generally speaking interface is purest form of abstraction, which simply denotes contract without any implementation details.  
  Depending upon how your language implements this OOP concept and tool, you can devise several differences e.g. in Java:  
  1) A class is allowed to extend multiple interfaces but only a single class.  
  2) An abstract class may contain  both abstract and concrete method, which also now true for interfaces in Java 8 due to default method but still abstract class can have constructor, which is not possible for interface.

Describe Bubblesort. (Really? Bubblesort? Is this the 1950s?)

* **Bubble sort**, sometimes referred to as **sinking sort**, is a simple [sorting algorithm](https://en.wikipedia.org/wiki/Sorting_algorithm) that repeatedly steps through the list to be sorted, compares each pair of adjacent items and [swaps](https://en.wikipedia.org/wiki/Swap_(computer_science)) them if they are in the wrong order. The pass through the list is repeated until no swaps are needed, which indicates that the list is sorted. The algorithm, which is a [comparison sort](https://en.wikipedia.org/wiki/Comparison_sort), is named for the way smaller or larger elements "bubble" to the top of the list. Although the algorithm is simple, it is too slow and impractical for most problems even when compared to [insertion sort](https://en.wikipedia.org/wiki/Insertion_sort).[[2]](https://en.wikipedia.org/wiki/Bubble_sort#cite_note-Knuth-2) It can be practical if the input is usually in sorted order but may occasionally have some out-of-order elements nearly in position.
* Not practical if N is large

What is the difference between int and double?

* If I understand correctly, double in python speak would be a float
* Double is a decimal
* Int 32 bit, double 64 bit
* Int faster
* Truncation differences but Python 3 different, depends on //

What is the difference between strong typed and weak typed language?

* A **strongly typed** language simply means that once assigned, a given variable will always behave as a certain type until it is reassigned. By definition statically **typed**languages like **Java** and C# are **strongly typed**, but so are many popular dynamic languages like Ruby and Python.
* Week type has implicit type conversion (PHP, C, PHP)

arrive at number 1000 by only using number 8 with any mathematical operators

888+88+8+8+8=1000

What is an operating system?

* It’s what runs your computer
* Everything from software, hardware, storage, memory, processes, etc.
* Firmware does not require OS (firmware - permanent software programmed into a read-only memory)
* Linux (GNU), Unix, Windows, Mac OS, BSD, Haiku

Explain the difference between the file systems used by OSX And Windows.

* NTFS – Windows
  + New technology file system
  + Files stored in master file table
* HFS+ - Mac OS
  + Hard disk format

If a company needs to cut costs, should it delete some data?

No. A company should never delete any of its data because it is a depreciating asset in accounting standards. The cost of storing data will always exponentially decrease but the operations that could use that certain data could be very valuable.

What is the SDLC?

* Software Development Life Cycle
* framework defining tasks performed at each step in the software development process.

SDLC consists of following activities:

1. **Planning**: The most important parts of software development, requirement gathering or requirement analysis are usually done by the most skilled and experienced software engineers in the organization. After the requirements are gathered from the client, a scope document is created in which the scope of the project is determined and documented.
2. **Implementation:** The software engineers start writing the code according to the client's requirements.
3. **Testing:** This is the process of finding defects or bugs in the created software.
4. **Documentation:** Every step in the project is documented for future reference and for the improvement of the software in the development process. The design documentation may include writing the application programming interface (API).
5. **Deployment and maintenance:** The software is deployed after it has been approved for release.
6. **Maintaining**: Software maintenance is done for future reference. Software improvement and new requirements (change requests) can take longer than the time needed to create the initial development of the software.

There are several software development models followed by various organizations:

* Waterfall Model: This model involves finishing each phase completely before commencing the next one. When each phase is completed successfully, it is reviewed to see if the project is on track and whether it is feasible to continue.
* V-Shaped Model: This model focuses on the execution of processes in a sequential manner, similar to the waterfall model but with more importance placed on testing. Testing procedures are written even before the commencement of writing code. A system plan is generated before starting the development phase.
* Incremental Model: This life cycle model involves multiple development cycles. The cycles are divided up into smaller iterations. These iterations can be easily managed and go through a set of phases including requirements, design, implementation and testing. A working version of the software is produced during the first iteration, so working software is created early in the development process.

Describe the Four (4) Principles of OOP?

* Data Abstraction, Data Encapsulation, Data Inheritance, Polymorphism
* <https://anampiu.github.io/blog/OOP-principles/>
* Data encapsulation can makes changes to a class without breaking other code that is calling the same class
* Data abstraction denotes a model or view to a real representation of an object in the real world
* Polymorphism – multiple methods all with the same name
  + 2 types: overriding – method is determined at runtime based on dynamic type of an object
  + overloading – compiler determines which method will be executed

What are the benefits of polymorphism?

* Less redundancy in code, one name many forms
* Way more efficient if you need to change something

What algorithms do you know?

* Lists, arrays, sorting, pattern matching and parsing (regex), hashing
* Network analysis: disjoint sets, HITS algorithm (hubs and authorities), Basic PageRank (Google and links)

Explain the efficiency of garbage collection in Java and C.

* garbage **collection** (GC) is a form of automatic memory management. The garbage collector, or just collector, attempts to reclaim garbage, or memory occupied by objects that are no longer in use by the **program**.
* Garbage collection frees the programmer from manually dealing with memory deallocation

Basic interview asked me to walk through a graph exploration algorithm (BFS/DFS)

* Breadth first search:
* Depth first search:
* Graph traversal

Is Java pass by reference or pass by value?

* Pass by value

How to make a looping program more efficient.

* Focus on inner loop since it executes the most
* Use more efficient data structures
* Move while to after do
* Don’t use unnecessary variables
* List comprehension

For a startup company which would be the best type of cloud computing model for it to adopt

SaaS, there's no overhead involved for IT infrastructure so just outsource cloud computing capabilities.

Explain the difference between Normalized and Denormalized data

What is normalization? When would you use denormalization?

* **Normalization:**
* Normalization is the process of efficiently organizing data in a database. There are two goals of the normalization process: eliminating redundant data (for example, storing the same data in more than one table) and ensuring data dependencies make sense (only storing related data in a table). Both of these are worthy goals as they reduce the amount of space a database consumes and ensure that data is logically stored.
* **Denormalization:**
* Denormalization is the process of attempting to optimise the read performance of a database by adding redundant data or by grouping data. In some cases, denormalisation helps cover up the inefficiencies inherent in relational database software. A relational normalised database imposes a heavy access load over physical storage of data even if it is well tuned for high performance.

What do you know about cloud computing and virtualization?

* **Virtualization** is the creation of a virtual -- rather than actual -- version of something, such as an operating system, a server, a storage device or network resources
* "**Cloud computing** is the delivery of shared **computing** resources, software or data — as a service and on-demand through the Internet." Most of the confusion occurs because **virtualization** and **cloud computing** work together to provide different types of services, as is the case with private **clouds**

If you had to, would you invest in future software or the current company system that works?

What is the difference between an array and a linked list?

contiguous vs non-contiguous memory; fast vs slow random lookup; slow vs fast insertion/deletion

How would you design a database? Design considerations.

How would make a sql statement run faster?

* Overloading vs overriding

What is the difference between method overload and override?

SQL - If search queries are taking longer than usually, and consuming too much processing power, what could be an issue of this?

The metadata structure may have unnecessary table joins

Difference between Primary and Foreign Key

Showing me a table of metadata, I was asked to write an SQL statement that returned the correct data elements

What's the most complex SQL related projected you've ever done in school

technical questions - oop, design patterns, syntatic sugar  
relocation questions

What is the difference between an inner and outer join? (SQL)

What are the file permission from this command "chmod 7 filename"?

chmod is a unix system call to change file permissions. A 7 would allow for full access. (read, write, and execute)

How would you describe object oriented programming to a non-technical person?

Advantages and disadvantages between using in-house development and outside vendor development?

Tell me about your experience in explaining technical things to non-technical person.  
Describe each phase in software development life cycle and output after each phase.

Write a program to produce a Fibonacci sequence

You can do this with a recursive function:  
cout:"Enter the number of sequences?"  
cin numOfSquences  
function fibi(numOfSquences){  
if(x == numOfSquences){  
return 0;  
}  
else}  
x = return fibi()+1;  
}  
}

What technologies are you familiar with?

Write the code for evaluating a post-fix expression.

Code to implement polymorphism  
Difference between "==" and ".equals()"  
Write query to get the youngest employee in each department from a given table

Find given subtree in a BST ?

Find and delete middle node of the linked list ?

Difference between html and html5.

Difference between 2-tier architecture and 3-tier architecture.

choose between Cloud Computing and Virtualisation for a JP Morgan system.

How does binary tree work?

Have you ever made a mistake in one project, but later in another project done well with the  
lessons learnt from that mistake?

what is SSL

Tell me a situation when you have missed a deadline?

There an old database and now they want to use a new database. How should migration happen without affecting users.

what is an immutable object in java?

Strings

How would you test a mobile, microwave, etc.

Questions on Anagram and Strings were very much asked to me.

What is De Morgan's law

A puzzle on probability. Using a coin instead of a dice in board game and to get all 6 numbers from that single coin.

Tech  
1) Difference between struct and class  
2) What is enum?  
3) Difference between enum and arrays  
4) Polymorphism with real life example  
5) Exception Handling  
6) Garbage Management  
7) What is friendly class and which languages use it?  
8) What are triggers  
9) Difference between Linux and Windows architecture  
10) How would you write text on Linux terminal that would directly get written onto a file  
11) Composition and Aggregation  
12) Write code for JDBC  
13) Experience of being stuck in a difficult situation in Java

1. What is an index in a database  
2. Phases of OOP  
3. OOP - Polymorphism  
4. Mutable/ immutable + examples  
5. HTTP/HTTPS - difference  
6. What is a relational database  
7. What is an array list  
8. How the encryption works with private and public keys  
9. Difference between parent and child classes  
10. Difference between agile vs waterfall development models  
11. What are the customer related software design phases  
12. What is a hash table

OOP Based questions  
1) Difference between struct and class  
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