



HOW YOU CAN BECOME A REMOTE SOFTWARE ENGINEER IN 2021

Like a Boss

An ALX intro into the world of software engineering



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THIS GUIDE

You did it. Downloading this guide means you just took a crucial step into the world of software engineering. Which is fantastic. Why? Because the opportunities that lie within this field are endless, and we're not saying that figuratively.

This is what we know:

- Demand for software engineers will grow 22% by the end of the decade. This is compared to an average of 5% in other industries.
- Africa is the world's fastest-growing continent for software developers.
- In 2019, the number of tech hubs in Africa grew by over 50%.

This guide will walk you through how you can best prepare for these opportunities. From learning how to become a software engineer no matter where you are in the world (and no matter what qualifications you hold), to sharing helpful resources to land your first gig, this guide has it all.

[^] That's millions of new job opportunities and endless possibilities. ^

Here's how you can get the most of this guide:

- 1. Read this in a quiet place to help you focus.
- 2. Take time to pause, reflect and write your answers in the worksheets.
- 3. Use the questions to guide you.
- 4. Be intentional about making a plan for your next steps.
- 5. Have an accountability partner who will help you track your progress once you commit to learning.
- 6. Complete the worksheets and set review times.
- 7. Follow through on your promises to yourself.
- 8. If you do decide to study software engineering, stay consistent.

Ready? Let's go.

Jemima Cole - Ghana

What's your stack; what languages do you code in?

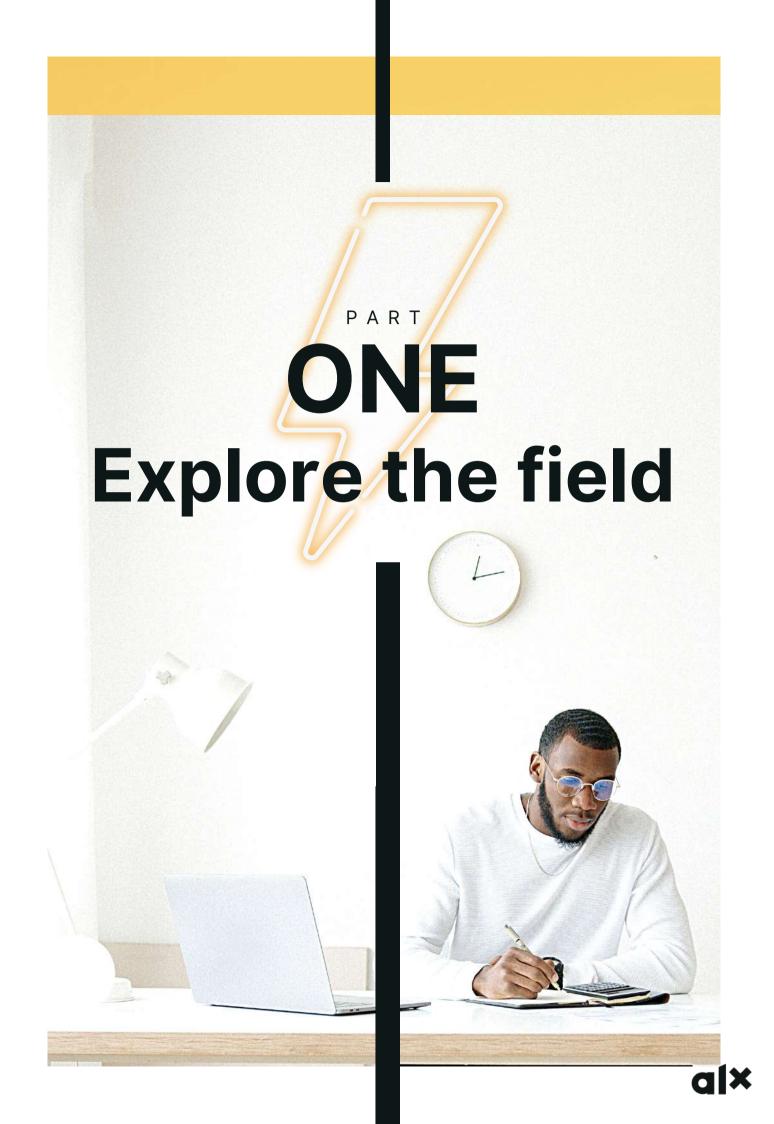
I'm a front-end developer. I work with HTML, CSS, and JavaScript... basically, the portion of a web app where the user sees and directly interacts with.

How long did it take you to start building projects by yourself?

I built my first website within 3 months of interacting with HTML & CSS. But, it took me 11 months to be able to confidently build something that's pleasing to my soul... alone.

What is the joy of engineering for you? Take your pick; career flexibility, high demand, increased creativity... I'm constantly kept on my toes.







What does a software engineer do anyway?

Great question. Think of it this way; anytime you visit a website, open WhatsApp, or share your latest pictures on Instagram, you're engaging with the end result of something a software engineer has built either alone or with a couple of other coders. In fact, the prevalence of code in our everyday lives is colossal. Even the buttons you press on microwaves and washing machine timers exist today as a result of code.

In a nutshell, a software engineer is someone who solves a problem by creating a digital solution for it in the form of code.

There are no limits to what software engineers can do. Literally. Coders can develop computer games, banking solutions, and so much more by using their imagination as well as their technical capabilities to write instructions into a computer to produce what an end-user interacts with as a game, app, website, or system.

It takes practice to get those 'superpowers'.



I'm a Java Engineer at American Express in the UK. I work in a team that's responsible for modernizing legacy code. I have done backend programming, .NET development, technical analysis, product management, and data engineering all at the same company.

There is no sure-fire way to go from zero to hero without focus and dedication and hard work. It takes practice to get those 'superpowers'. I think that there is the need to recognize that you will not know everything, and that it is OK to ask questions and ask for help. Even seasoned engineers need help from time to time.

It is very important to believe in yourself. There aren't as many women software engineers as there are men, but don't let that intimidate you. You can do anything that you set your mind to, and it is very important that you do not compare your career journey to anyone else's. Everyone's journey is different. Please, please, do not be afraid to ask for help or guidance. There are always people out there who are ready and willing to help.

Computer science and software engineering. What's the difference?

Computer science and software engineering are not exactly the same thing. You can think of computer science as an umbrella where different engineering sciences fall under. Machine learning, artificial intelligence, and data science are all different topics under computer science. Software engineering is therefore one out of many different subjects.



Why you want to consider studying software engineering

Africa's internet economy is booming faster than anywhere else

A recent World Bank report projects that Africa's internet economy can add \$150 billion to its GDP by 2025. This immense projected growth will need software engineers on the ground to sustain and channel it where it is most needed.



This is where the money resides

The earning potential in this market is incredible - and it keeps growing. Not only that,

but investment and funding opportunities are also high. Partech Partners recently reported this: "In such a challenging year, more startups have closed rounds than in any previous year. (The) activity has grown by almost half. No other region in the world has seen anything like this. The global interest for the African tech ecosystem remains strong even in the context of the global crisis driven by the pandemic."



You'll be stepping into a future proof career

Roughly 4.66 billion people around the world used the

internet at the start of 2021. That's close to 60% of the world's total population. This number is still growing too, with DataReport's latest findings revealing that 319 million new users came online over the past 12 months. This means there is a greater demand for digital systems to cater for these people and their needs - bringing new opportunities to offer different services across the globe.



Fast track your growth as a newbie software engineer

•••

We asked successful software engineers: What is the fastest way to grow?

Derrick Mwangi - Kenya

- 1. ALWAYS READ THE DOCS.
- 2. Setting up your development environment is way easier now because computers are way better and faster.
- 3. If you love what you do, you will never have to work a day in your life.



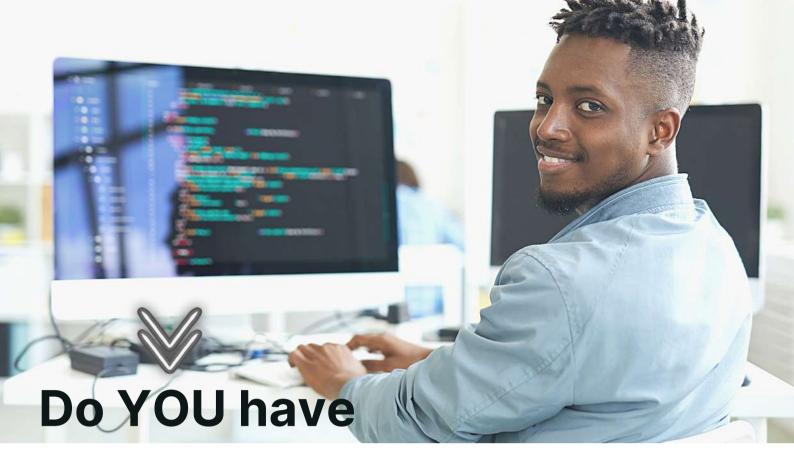


Samuel Danquah - Ghana

While pursuing Aerospace Engineering, I was given a course project to build a web application. I knew nothing about web development and this sparked my journey.

Throughout my career, I have found groups, hackathons, hubs, and challenges that have allowed me to continue learning and meet new people.

I even met one of my co-founders at a hackathon!



what it takes to be a software engineer?

O1

So we've covered what software engineering is and why you should consider it as a viable career. Now it's time for you to find out if you have what it takes. Here are some questions to guide you:

Do you love problem solving?

Problem-solving skills are core to what developing software is about. A good amount of time is spent figuring out the best way to solve a problem. Sometimes, the solution you're thinking of may have never been done before. The ability to solve these complex abstract problems with functional code is what separates the good engineers from the great ones.

Can you take ownership?

You will fail. You will fall. But, what will define and carve out a strong path for you, as cliche as it sounds, is your ability to stand up - again and again. Software development is not easy, but then again, nothing is. So if you are open to making mistakes and learning from them to grow as an individual - this is the place for you.

Are you curious?

Developers have an endless fascination with how things work. Every time they look at a system, they wonder — How is that done, can I make one? Can we make it faster and better? They want to fix and they want to build so they understand how a system works. One of the best ways to get better at what you do is to feed your curiosity. Start to wonder what is missing that would make life easier and better for the people around you. Along that path, there are obstacles but there are answers. Some of the greatest inventors and engineers all agree that curiosity can make you great. Even Einstein said it. It was only that he was passionately curious.

Fast track your growth as a newbie software engineer

We asked successful software engineers: What is the fastest way to grow?

Dapo Ibindapo - Nigeria

Try to write some code every day. Learn the syntax and basics of a programming language, then embark on projects that you can later put on your portfolio. It won't be perfect at first but consistency is truly key in everything.



Reba Seape - South Africa

English is one of the biggest barriers to most engineering challenges. Get that right and the world is your oyster. (Software engineering is) one of the greatest things in the world to do.





Exploring different software engineering paths

If you've answered yes to all three questions in part one, this could be a great fit for you.

Now let's think about which career you might want to explore with your interests (and new software skills). Some of the most popular types of software engineer roles are:

Software Analyst - A person who studies the software application domain, prepares software requirements and specification documents.

Front-End Engineer - They elect, install and test the user interface elements of a website.

Back-End Engineer - They are responsible for building and maintaining the components that make the front end of systems possible in the first place.

Full Stack Engineer - This is an engineer who handles all the work of databases, servers, systems engineering, and clients.

DevOps Engineer - An IT professional who works with software developers, system operators, and admins, IT operations staff and others to oversee and/or facilitate code releases or deployments on a CI/CD basis.

Security Engineer - Security engineering focuses on designing computer systems that can deal with disruptions such as natural disasters or malicious cyber attacks.

Mobile Software Engineer - They specialise in mobile technology such as building apps for Google's Android, Apple's iOS, and Microsoft's Windows Phone platforms.

Network Engineer - Someone who plans, constructs and manages networks to ensure they're optimized and functioning as intended.

Quality Assurance Specialist - They check the implementation of the quality system, and monitor results from processes and procedures.

iOS Developer - They are responsible for developing applications for mobile devices powered by Apple's iOS operating system.



PART 02

Android Developer - This is a software developer who specializes in designing applications for the Android marketplace.

Technical Writer - Someone who transforms complex and technically written material into clear and concise documentation.

Video Game Developer - A software developer specializing in video game development.

Website Designer - Web designers build or redesign websites. They understand what it takes to make a website functional and easy to use.

Software Tester - An individual who tests software for bugs, errors, defects or any problem that can affect the performance of computer software or an application.

TOP TIP: Since this industry grows at such a fast pace, the best way to choose a path is to find your north star. How can you do that? By asking yourself what you want. If you have a deep interest or passion for a specific field, you could spend some time researching the ways in which some of these roles could apply to that field. For example, there is a great need for software developers in agriculture, education, art, and other emerging fields.

BONUS: Want to take a pause to reflect on finding your purpose? Check out <u>The Ultimate Guide</u> to Living a Life of Impact.



The Ultimate Guide To Living A Life Of Impact.

[Get 1 Free Guide + 5 Workbooks]

DOWNLOAD NOW! **(1)**



Get coding: How to choose a programming language

What is a programming language?

Learning how to code has been likened to learning the language of computers. So, in order to give a computer certain instructions, you have to learn a programming language.

What are some programming languages that exist today?

There are over 600 programming languages today (and this is an estimation). Some of the most popular languages are: Python, Javascript, Java, C++, C#, and PHP. So, where to start? It all depends on your career goals, the industry you want to enter, and sometimes, the country you're in. GitHub has a pretty nifty tool (the PYPL index) that ranks the popularity and demand of languages based on how many times coders search for them on Google. You can check it out here: https://pypl.github.io/PYPL.html

DID YOU KNOW?

Instagram, Google, Spotify, Netflix, Uber, and Dropbox use Python.

How to choose a coding course

If you've never done well in classes like mathematics in high school, you may be worried about writing code. You could also have heard horror stories of people spending many nights trying to make their "code work." You don't have to worry. All you need to do is begin at a level that works for you, and go at a pace that challenges you, but doesn't discourage you.

Here are some guiding questions to help you land at the right coding course choice for your unique journey:

- Is this course built for someone at my level of computer knowledge?
- Does this course suit my learning style? Does this course provide me with the opportunity to solve complex coding problems?
- Will I use this technology to build something people will want to use
- According to the course outline, what skills will I gain that I can put on my resume?
- Does this course have benchmarks that I can use to stay motivated?

Close-up

Winifred Naa Oyoo Quartey - Ghana

I'm a full-stack developer, however, I'm focused more on developing the backend infrastructure and systems. Most of the applications I've worked on so far are financial apps or solutions for financial institutions. This requires logical thinking and accuracy for solving complex problems to deliver a secure, reliable, and scalable solution.

It took me 1 year to launch my skills - I built a project by myself after my first programming course and internship.

The joy of engineering for me is being able to implement solutions to solve complex problems.



Java - MongoDB - Mysql - Oracle elasticsearch - Kafka - Javascript Groovy - Polymer - React - Spring boot
- Nginx - Linux - XML - C# All the languages
Winfred can code in

Tips from Winfred:

- Read tech blogs/articles to follow what's going on in the tech world.
- Use free online resources and dev communities you can seek inspiration from.
- Once you understand the basics and fundamentals of programming it's easier to pick up a new programming language.
- More practice, practice Being hands-on is the best way to learn.
- Pay attention to detail.
- Always consider alternate use cases/scenarios, especially error scenarios, when programming to make your code more robust.





Ready to code?

The good news is, you can start coding right now. Thanks to the internet and software developers who have walked this path before you, there are now ample FREE resources online to explore:

GitHub https://github.com/

W3Schools https://www.w3schools.com/

Free Code Camp https://www.freecodecamp.org/

Khan Academy https://www.khanacademy.org/

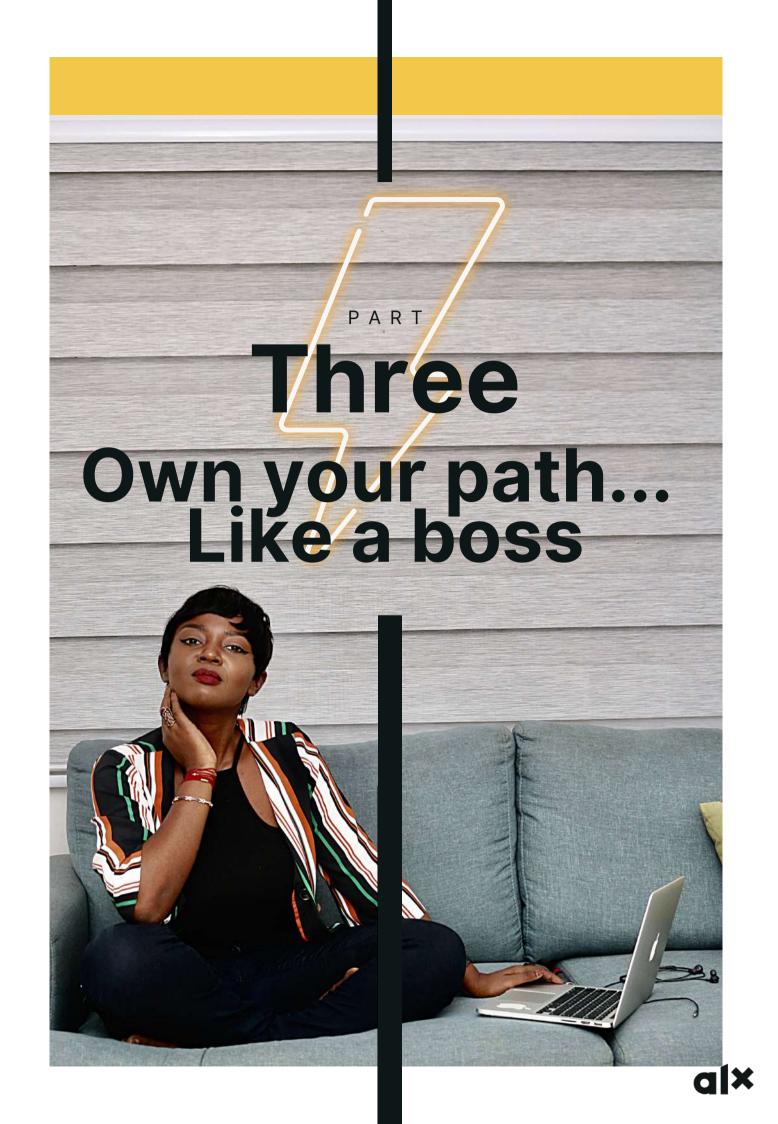
Looking for a certificate in software engineering?

Pay only after you are employed.

The rigorous and rewarding 12-month <u>ALX Software Engineering programme</u> and will prepare you for a well-paying career in the digital economy.

- Front-end Developer
- Back-end Developer
- Dev Ops

Wrap your new technical skills in the leadership development from <u>ALX</u>, and equip yourself for a meaningful career of growth and impact.





Close-up Joy Adowaa Buolamwini Ghanaian-American

A Ghanaian-American computer scientist and digital activist.
She founded the Algorithmic Justice League.

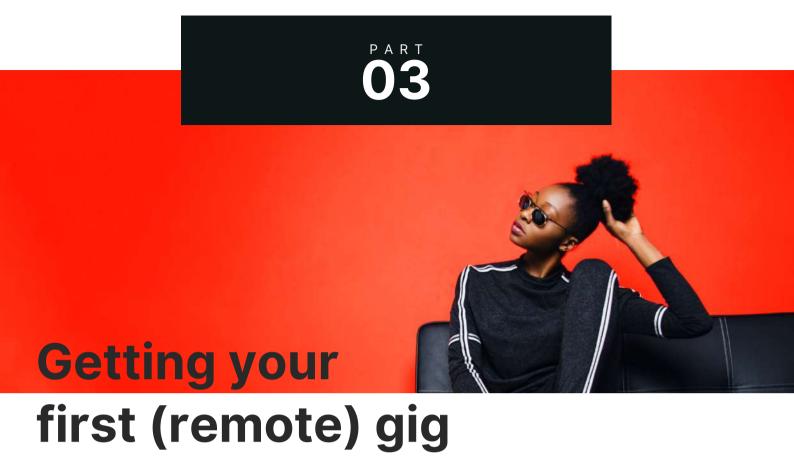
The mission of the <u>Algorithmic Justice League</u> is to raise awareness about the impacts of Artificial Intelligence, and compile and share research while building representation that mitigates AI harms and biases.

Her MIT thesis methodology uncovered large racial and gender bias in Al services that even affected how the police force was trained in America.

Joy's work is an example of how computer science can be used to reduce harm in underrepresented communities while transforming technology. Many more women, especially black women, are needed in computer science and software engineering to identify and raise the alarm whenever they see bias occurring in technology.

This is how people make an impact, by coding different programs that make the world better in every way.

How do you want to use tech for positive change?



Your coding practice has paid off and you're now coding like a pro. What comes next? It's time to land your first gig.

These are our tips:

Create your digital presence

Before you even start applying for gigs, you must display your skills in some shape or form. The best way to do this is by creating an online portfolio. Make sure your portfolio has a clearly written bio that also features your latest works, as well as the industries you've operated in. You could even find ways to build a virtual resume that could impress anyone who googles your name when you start applying. Need inspiration? Check out this creative technologist's portfolio: https://uzomaorji.com/

Register on freelancing sites

Create a profile on some popular freelancing sites in order to get access to opportunities. Some of the ones we recommend are: **E- Worker**, **CodeIn**, **Upwork**, **Freelancer Toptal**, **Fiverr**, **and PeoplePerHour** - all of which can help you find international projects. Platforms like Good Talent and CodeIn even help you verify your skills as a developer. A 3rd party verification or certification will help you stand-out and gain trust while applying for remote gigs and full-time roles.

If you have studied with ALX, you will have access to employment networking.

P A R T

Shoot your shot

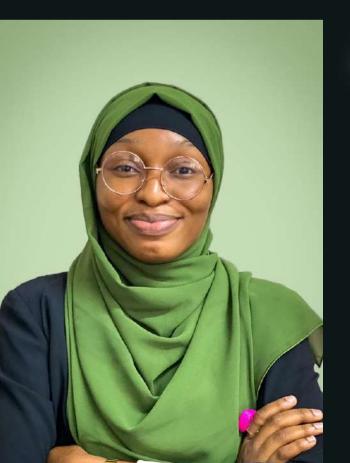
You can also kickstart your career by making a list of companies you'd love to work for, and then reach out to them via email. Study the company, research what stack of programming languages they use, and demonstrate your ability to use them (through projects of your own). Free web extensions like Wappalzyer and Whatruns on the Chrome Web Store are great tools to help you determine what languages different company websites use.

Join a virtual community or find a tech hub near you - asap

Perhaps the best way to ensure success in any path you walk is to walk it with a community of people. What's great about software engineering is that there are many virtual communities that you can plug into. You can join a <u>Google Developers Group</u> near you, a <u>Facebook Developers Group</u> as well as other virtual communities on <u>Reddit, Stack Overflow</u>, <u>GitHub</u>, <u>Dev Congress</u>, and more. In addition, if you're in any major city on the continent, a good Google search can probably lead you to a tech hub near you.

Set up an international bank account

It's essential to stay ready for any opportunities that come your way - no matter where you are in the world. Book a meeting with a relationship manager at one of your local banks. You can ask questions to understand how they serve small online businesses. Aim to understand the different kinds of bank accounts available, along with their conversion rates. Once you have set up your bank account, link it to either <u>Transferwise</u> or <u>Paypal</u> for ease of receiving payments.



Bonus tip!

Zulaiha Abdul - Ghana

You need to be curious. That will push you to always look for information.

Get an accountability partner, because of COVID-19 you can use tools like <u>Code Pen</u> or <u>GitHub</u> to share your code for others to view and correct. When you learn with the intention to teach it helps a lot, so start a technical blog on <u>Medium</u> as you learn. This will extensively boost your confidence and portfolio.



Close-up

Nhlanhla Nkosi Sibanda - Zimbabwe



I'm the Chief Technology Officer @ Phenomenon Technologies. I make sure we, as a company, create the most innovative and market standard technology products that meet the expectations of the company and of the consumers. As a mobile application developer myself, it is also my duty to create the company's mobile solutions in collaboration with other developers.

While I now develop mobile applications in Java, Kotlin, and Swift, it took me a year to gain the necessary skillset and confidence to start building projects by myself.

The joy of engineering to me is seeing the solutions that I played a part in creating being used.

The best way to succeed in this career in a year is to learn by doing. By this, I mean, it is easier to understand programming concepts by actually building real-world projects rather than reading about these concepts from a textbook or online. The more projects one builds the better the understanding of the concepts involved in building a project. Also, acquiring great skills like collaboration and learning how to ask the right questions from the internet when you are faced with a programming challenge is key.

To any aspiring software engineers out there, I would like to say that, becoming a software engineer, like many other skills worth having in the 21st century, takes patience, hard work, and perseverance. Software engineers are always learning something new almost daily because of the rapid change in technological advances. As a result, a successful software engineer is one who is willing to unlearn and learn at the same time.

Happy coding!

BONUS:Reflection Worksheet

Think about what kinds of steps you want to take so that you can build your own unique career.

- 1. Take a moment to think about what you believe makes up a career of impact.
- 2. Write down at least three career paths that interest you.
- 3. Based on these different careers, which one would you be most interested in pursuing right now?
- 4. Try to observe yourself: what's guiding your motivation and drive?
- 5. Write down your answers and set up smart goals that you can measure.

In 3 months, I will have started
In 6 months, I will have achieved
In 9 months, I will have done
In 1 year, I will look back and think to myself

As you fill these questions in, open your calendar app or any other scheduling app and set a reminder for a review of your progress.

Bringing it all together

We wish you the best on your journey to becoming a software engineer.

We hope you believe that you can be your own boss. Harness your skills and determination to carve out a unique path for yourself, and stay curious - always.

To learn more about the all virtual ALX Software Engineering programme with no upfront cost to get your certificate and employment advisory, check out <u>our website</u>.

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P.S. Stay in touch by sharing your story of how you're navigating the software engineering industry like a boss and tagging us on ALX social (<u>Facebook</u>, <u>Instagram</u>, <u>Twitter</u>, and <u>LinkedIn</u>).

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