

خارطة طريق لغير خريجي حاسبات

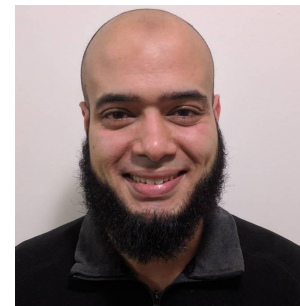
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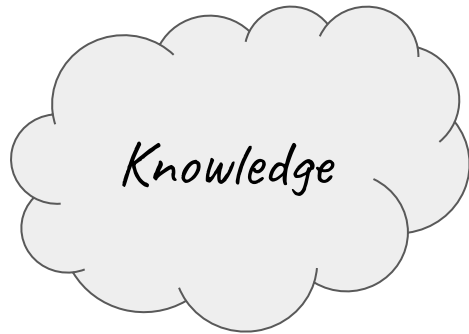


Audience

- Someone with a specialisation far from Computer Science and want to do a career shift.
- A student who is about to graduate and used to ignore studying, but now regrets and wants to find the shortest way to the market.
- Don't try to do this plan while also busy with something else (e.g. another college)

Prerequisites

- English skills: Good or plan to be good soon
 - Reading skills: To be able to learn from books
 - Listening skills: Learning is faster from videos / online courses
 - Writing skills: For communication inside companies / applying for jobs
 - Speaking skills: Sometimes talking to English customers
 - *If your english skills is weak; don't start. Enhance English first.*
- Hard worker
 - You need 12-15 months in this guide to get in the market / 8-10 hours a day
 - Then 2 years follow up plan to cover more basics, **parallel to work**
 - You will keep learning the new fields/technologies/frameworks **forever**, like everyone



VS



Knowledge & Skills ladder



Skipping fundamentals



3 roadmaps out there!

- Full courses study, as if u were a student (3 years)
 - E.g. following a big university courses list or [OSSU](#)
- 9 / 15 months plan
 - [ITI](#) has 9 month program. Not sure of prerequisite. **Great** opportunity
 - *My roadmap is 15 months*
 - 4-6 months fundamentals: programming, oop, problem solving (algorithms/data structures)
 - 3 months: expanding some knowledge in CS courses
 - 6 months: Market technology focused
- 3-5 months diplomas
 - Some guys announce such very short courses/projects
 - I believe this is very bad choice ... and most of providers targets fast turnover

Roadmap Big Picture: 3 Stages

- **Mastering** a programming language, such as Java or C#.
- **Mastering** Object Oriented Programming (OOP) Skills
- Fair understanding for **data structures**
- Some background in **Algorithms** / skills (the more, the better)

4-6 months

- Enhancing your **CS background**
 - Major courses
 - Non Major courses

3 months

- Master some **popular technology** market direction
 - Backend
 - Frontend: web or mobile [IOS, Android]

6 months

Stage 1A - The critical core

- Programming.
 - Strong in programming => Most of next things will be a piece of cake
 - You should learn several languages. During this roadmap, focus on 1 or 2
 - [Java](#) or C# are general purpose languages. Python also increasing in the market
 - In your first language: set a goal to read a book from A-Z (something 1000+ pages book)
 - To learn initially: Attend a course or youtube playlist
 - Programming can be thought as 2 parts: Basic syntax and OOP
- Programming:: Basic Syntax
 - Data types, Selection, Repetition, Functions (aka Methods), Arrays
 - Also: Very Basic class creation, Java Collections, Basic Files read/write
 - Now, Implement 1-2 projects of a reasonable size. Here is an [example](#) (it is from my [playlist](#))

Stage 1B - The critical core

- Programming:: OOP
 - Objects, OOP (Inheritance and Polymorphism), Exceptions
 - Develop new 1-2 console [projects](#) using OOP (e.g. from TopCoder [projects](#))

Stage 1C - Problem-solving [recommended]

- If you want be stronger in coding, highly recommended to do it
 - It is based on data-structures and algorithms, but learning them in incremental smooth way
- First, understand what is: [Online Judge](#) / [Codeforces](#).
- Follow my [sheet](#) and solve levels 1 ro 3
 - You can solve level 1, then 2 and 3 later in parallel
- Stage 1C can go **parallel or before** Stage 1B
 - Going **before** actually makes you stronger

Stage 1D - Data Structures Course

- Do after Stage 1B.
 - If started after Stage 1C, you will understand **so fast**
- Study the **basic topics** (Stack, LinkedList, Queue, Binary Search Tree)
 - Write code and play with it
- Understand and use Hashtable / Sets
- The most critical outcome:
 - **When** to use a data structure?
 - What is the time **complexity** of it?
- Internet has many courses. My [playlist](#)

Stage 1E - Algorithms Course [recommended]

- If you did 1C, you won't need to do 1E
- Learn to compute Algorithm **Order** Complexity
- Algorithms
 - Graph Theory: Representation (DFS, BFS, Dijkstra).
 - Binary Search technique
 - Trie Data structure
 - Dynamic Programming
 - Greedy
- I hate to tell you can skip this phase, but many do so and they're working

Stage 1F - More programming concepts

- You need to understand & be good in more concepts
- Complete a programming book from A-Z
 - multi-threading, client-server, crawl internet pages.
 - Better learn multithreading after some chapters in Operating systems
 - Better learn client-server after some chapters in Networking
 - Implement a client-server chat app that uses multithreading
 - Be aware of things such as Unicode, Internationalisation, Regular expressions
 - Deeper in files reading/writing/exceptions - Mastering Collections
 - Do a project or enhance the previous projects with what you learned
 - Learn basics of GUI, but [don't](#) waste time over it [optionally]
- Optional: [**CS 50**](#)

Stage 1 Summary

- **Must do 1A and 1B**
 - You must do good-size projects to build an important skill (building projects skill)
- Must understand 1D to some extent
- Optionally but recommended either 1C or 1E
 - You can also make it parallel to stage 2 and/or 3
- Proceed with 1F, but better parallel to stage 2

Stage 2: Enhancing your CS background

- Stage 2A: Core practical CS subjects (initially 3-5 chapters)
 - Networking, Operating Systems, **Databases, Software Engineering**
 - Last 2 are much more critical to go deeper, especially Databases for backend guys
 - SWE: Learn to build class and Sequence diagrams. The waterfall model, the agile.
 - Later, learn design patterns
 - Do projects/apps that utilize what you learned
 - Also Discrete Mathematics is very useful to mind & skill (enhances also 1C)
- Stage 2B: Relevant courses
 - Read initially 1-3 chapters
 - Computer Theory, Assembly programming, Computer Architecture, Computer Graphics, Cryptography, Security, Cloud Computing, Parallel Computing
 - Avoid [Math](#) (Probability, Calculus, Linear Algebra)
 - You can stage parallelize 2B with stage 3

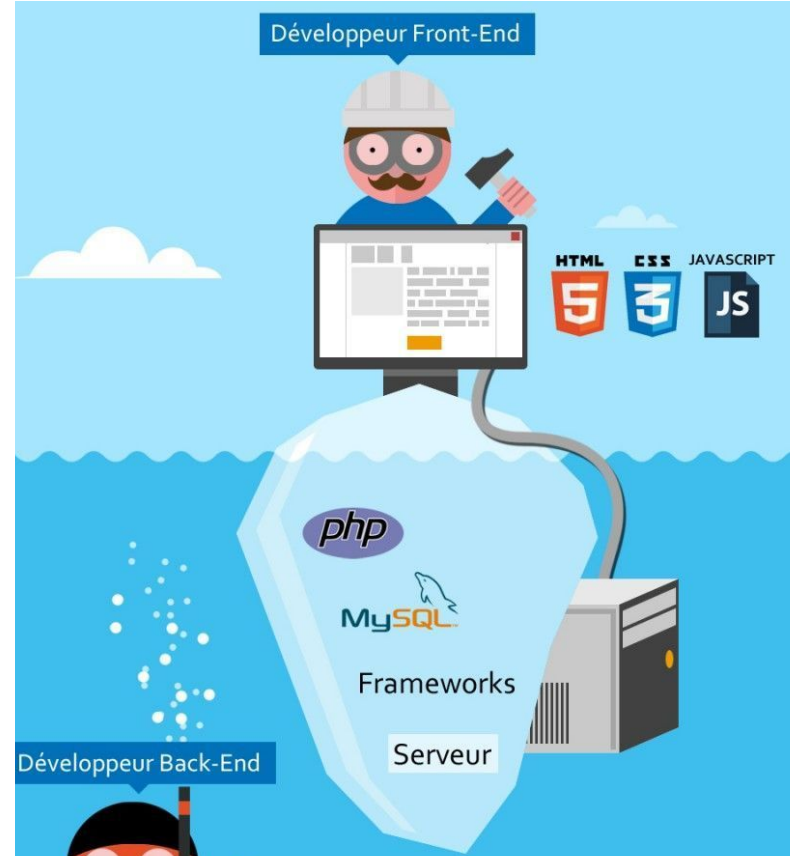
Stage 2: Materials

- Most of choices are ok. E.g. Use [ossu](#)
- For databases: Arabic [Playlist](#) - [Course](#) - [Course](#) - [Book](#)
- Discrete Mathematics: [Arabic](#) - [book](#)

Stage 3: Market Track

- Front/Back end software engineers are the **most popular**
- Many nice jobs are still limited in Egypt (2020)
 - Data science, Machine Learning, Embedded development, Games Development, Security

Img [credit](#)



Stage 3: Search for jobs: Get sense of Technologies

- Google it, e.g. *backend developer cairo jobs*

The screenshot displays a job search interface. On the left, a sidebar lists several job openings:

- Ruby Backend Developer** at uLeague, Cairo, Egypt, via Wuzzuf. Posted over 1 month ago. Full-time.
- Backend Developer** at Automated Systems, Maadi, Egypt, via Wuzzuf. Posted 3 hours ago. Full-time.
- Senior Back-End Developer** at Eksab, Cairo, Egypt, via Naukri Gulf. Posted 5 days ago. Full-time.
- Back-End Java Developer** at IdealWaves, Cairo, Egypt (+1 other), via Wuzzuf. Posted over 1 month ago. Full-time.
- Senior Back-End Developer** at Travolic.LLc, Cairo, Egypt, via Naukri Gulf. Posted 6 days ago. Full-time.

The main content area shows the details for the **Ruby Backend Developer** job at uLeague:

- Job Title:** Ruby Backend Developer
- Company:** uLeague, Cairo, Egypt
- Buttons:** Apply on Wuzzuf, Apply on Naukri Gulf
- Posted:** Over 1 month ago, Full-time
- Description:**
 - We are building our own technical superstar team here in Cairo, Egypt.
 - We are looking for developers that can take this start-up to next stage, whilst having deep technical experience building platforms with Ruby on Rails. Our platform is dynamic, so we are looking more for thinkers and doers – not just coders!
 - Our Back-end Engineer will own the tasks of the back-end development of the platform and will be required to build, enhance, maintain and innovate the backend infrastructure behind this great initiative.
 - They have to have great interpersonal skill. job requirements
- Experience:** 1 to 3 years
- Not Specified at least**
- Computer Software E-Learning Education Job Roles:** Engineering - Telecom/Technology IT/Software Development
- Company:** uLeague
- Search:** More jobs at uLeague

Stage 3: Search for jobs: Get sense of Frequency

- Google it, e.g. *android software engineer cairo jobs*

The screenshot shows a Google search results page for the query "android software engineer cairo jobs". The search bar at the top displays the query and the location "Near Cairo, Egypt". Below the search bar, there are tabs for "JOBS" and "SAVED". The "JOBS" tab is selected, and the results are filtered by "Title". The search results are displayed in a list format, showing job titles, company names, locations, and dates posted. The first result is "Software Engineer II - Android" by Careem, located in Cairo, Egypt, posted 2 days ago. The second result is "Android Developer" by Collins Co, located in Cairo, Egypt, posted over 1 month ago. The third result is "Senior Android Developer" by New Aeon, located in Cairo, Egypt, posted 5 days ago. The fourth result is "Android Software Engineer" by Eazy Mobility, located in Cairo, Egypt, posted via Naukrigulf.com. The right side of the screenshot shows a detailed view of the "Software Engineer II - Android" job listing, including the company logo, name, location, and a description of the role.

← Google Near Cairo, Egypt

JOBS SAVED

Title Location Date posted Type Company type Employer

All Senior Software engineer Android engineer Frontend engineer Team leader Testing engineer Engineer Mobile engineer Product manager Programme

Software Engineer II - Android
Careem
Cairo, Egypt
via Naukri Gulf
2 days ago Full-time

Android Developer
Collins Co
Cairo, Egypt
via Wuzzuf
Over 1 month ago Full-time

Senior Android Developer
New Aeon
Cairo, Egypt
via Wuzzuf
5 days ago Full-time

Android Software Engineer
Eazy Mobility
Cairo, Egypt
via Naukrigulf.com

Software Engineer II - Android
Careem
Cairo, Egypt

Apply on Naukri Gulf Apply on Greenhouse Apply on Wuzzuf Apply on SeekOrSwim

2 days ago Full-time

About the role: You will get to work on Careem's first mass product offering, Careem BUS that aims to serve customers across the region. Our Android developers have a passion to push mobile technologies to the technologies including AWS, Redis, Kafka, and Postgres. As an Android Engineer you will:

- Design and build platform
- Work with the Product and Design teams to understand end-user requirements and use cases
- Integrate with our backend services (JSON, REST, etc.) to make sure we are delivering for end users
- Own end-to-end product modules/features from requirement to going live
- Design and review team members on technical matters
- Gather requirements by interacting directly with the end...

READ MORE

Stage 3: Search for jobs: Get sense of Frequency

- Notice: Many of the opportunities are hidden
 - Handled through recommendations insider the company
 - Networking with people (in the company, college, meetups, conferences) is critical
- Use linkedin
 - See for job postings
 - Create profile, add people
 - In their connections, see what are their jobs / job history

Stage 3: Market Track - Front End

- Frontend (Web, IOS, Android)
 - Android: [udacity-nanodegrees](#) - Skill [Set](#)
 - IOS: [IOS](#) - [Course](#) - [Arabic](#) Course
 - Web: [Web](#) / [Web](#) / [CS50](#) / [Video](#)
 - Cross Platform (e.g. Flutter, React Native)

Stage 3: Market Track - Backend

- Backend: **Core**(OOP, database, SWE design) + Technology Track
 - Database: Learn SQL very well, then later NoSql
- Several Technology tracks - Search & decide as varies over time
 - [Guide](#)
 - [Php & Laravel](#)
 - [Ruby on Rails](#)
 - Python, Flask & Django
 - Java EE (web services, JMS, JPA, ...)
 - Node.js
 - [Course](#)

Stage 3: Market Track - Full Stack

- Full Stack = Can handle both front and backend
 - Maybe better select first one area to be good at first
- [Full Stack](#)

Stage 3: Enhancing Skills

- Don't rush in the core part - moving from technology stack to another easy
- Whatever track: Build 3 projects of big size. This is your **CV** Core
 - Apply SWE concepts as much as you could
 - Well documentation for your project
 - Upload on github with screenshots and/or demos
- Then, build linkedin account and find job

Find a job

- Send CVs to companies. Attend job fairs. Your first job will be hard to find
- In parallel, start to do freelancing: such as [upwork](#) or others
 - It takes time to understand the process
 - It takes time to get your first customer
 - You can be 15-20 dollar per hour
- Salaries
 - Some companies make use of guys without certificates or weak graduates
 - Might be paid 2000-3000
 - Proper salaries are 5000-6000 ... some companies a bit more
 - Anyway. Get your 'good' job. Good here in terms what you will learn not the money
 - Later move to the right opportunity

Stage 4

- Now you got a job. Work in parallel to enhance your background
- Learn several other programming languages (e.g. Python, Go, Javascript)
- For every CS subject, go deeper. Do a project
- Good in several OS: E.g. Windows and Linux (ubuntu)
- Soft skills: Presentation / Communication / Writing skills ...

Challenges

- Self-discipline
- Time availability: being a student in another college
- No provided assignments/projects
- No TA to help/mark assignments/projects
- Weak connections
- No internships
- Difficulties in the first job

Concerns

- Certificate
 - No / Online / Some institute
 - Working abroad
- Age
- Tools
 - Office tools (microsoft or google ones): Word, Power Point, Excel
 - [Git](#) / Github
 - Command lines
 - Management tools: Trello.com

Notes

- You can't learn 1-2 courses and find a job or freelance!
 - A lot of effort must be put
- You can be bad in math and still be very good software engineer!
- Learning programming in the first 2-3 weeks might be hard! But after that, normal.
- It is better to attend online courses for Programming and OOP
 - You may also attend for data structures and algorithms
 - You don't need to attend in other

Got lost?

- The first 2 targets are fundamental and when you are good, you will understand remaining Easily (**Programming language + OOP**)
- 1- Learn programming language such as Java or C#
 - Learn from online/onsite course
 - But, Read it later from a book, page by page.
- 2- Do 2 console projects (See example [here](#))
- 3- Learn OOP
- 4- Do 2 OOP projects (better new ones)
- 5- Learn github tool. Upload your projects with screenshots
- Now, after that read the roadmap again

Anticipating the future

- One property in this field is its dynamicity
 - Today languages/technologies will die at some time
 - Search about Javascript/Machine Learning in market size
- Few things to do
 - Keep your eyes on the new things - try them out
 - Try to understand the trends.
 - Don't wait till something be so clear as part of the next 5 years.
 - More importantly, be a graduate with strong basics
 - Being strong in basics = Fast learner = More confidence
 - Don't fully depends on what faculty gives. Do your homework. Go beyond that
- Skills & Responsibilities for my next career steps

Links

- 7asebat [playlist](#)
- My [ask.fm](#)
- [OSSU](#)
- [ITI](#)

تم بحمد الله

علمكم الله ما ينفعكم

ونفعمكم بما تعلمتم

وزادكم علماً