



# Computer Science Academy Africa



A report on CSA Africa 2022, which took place from 18 July – 03 August 2022, in partnership with the NITDA IT Hub (NitHub), University of Lagos, Nigeria.

Photos: <https://www.csafrica.org/csafrica-2022>

Videos: <https://www.youtube.com/channel/UCXm5CchVnKjLK9IsHDnKdrA>

Two activities were delivered during our time in Nigeria: (i) a Python programming workshop; and (ii) a one-day conference for women in tech.

## Programming workshop



The programming workshop ran physically, and it consisted of seven team members from the University of Glasgow, eight local volunteers, and 194 participants from across Nigeria (selected from a pool of 2024 applications received from 18 different African countries). About 47% of the selected participants were women<sup>1</sup>, childcare support was provided for three mothers who came to the workshop with their children, travel support was provided for 36

participants who travelled from outside Lagos, accommodation provision on the University campus for 126 participants, and daily lunch for all.

*Participants' demographics:* From the 194 selected participants, 52.5% were affiliated with the University of Lagos, with the remaining participants from other Universities in Nigeria, including: University of Ibadan (8%); University of Ilorin (6.7%), University of Nigeria (3.6%), Federal University of Technology Akure (3%), Federal University of Agriculture Abeokuta (2%); Lagos State University (2%); Obafemi Awolowo University (2%); Federal University of Technology Minna (2%), and others. In addition, about 3.6% of these participants were professionals working in the industry. Also, as expected, majority of our participants are studying either a Science or an Engineering related subject. However, we also had participants studying Law, Economics, Accounting, Medicine, Pharmacy,

---

<sup>1</sup> We were intentional about increasing the gender balance by emphasising everywhere during the application process that women are strongly encouraged to apply, as well as reinforcing our aim to provide childcare support for those with children.

Psychology, Nursing, English, Philosophy, Zoology, Botany, Dentistry, Business Administration, and Anatomy.

The workshop learning outcomes were divided into six different tracks as outlined below, with two parallel tracks in the first week and four in the second. For more information on the concepts covered, see <https://www.csafrica.org/csafrica-2022>.

- Week 1 Track 1: Introduction to Python Fundamentals (120 participants)
- Week 1 Track 2: Further Programming (60 participants)
- Week 2 Track 1: Introduction to Python Fundamentals cont'd (110 participants)
- Week 2 Track 2: Data Structures and Algorithms (18 participants)
- Week 2 Track 3: Introduction to Machine Learning (20 participants)
- Week 2 Track 4: Introduction to the Internet of Things - IoT (15 participants)



The workshop adopted a mix of live lectures, live-coding, and hands-on problem-solving session by participants, in no fixed order, all with the help of tutors. For getting materials across to participants as well as for communications, we made use of Moodle. The workshop culminated in a team-based project that spanned two days in the final week, with an average of five to seven participants per group, and with gender and diversity factored into the clustering. For the first time, participants were allowed to brainstorm project ideas, and we were blown away by how creative they got with constructing problems, the solutions they came up with, and how they were able to pull together everything they learnt in two weeks and more.

Some of their amazing projects include: a simulation of Simon Says; a medical bot that predicts diseases based on symptoms; a simulation of Tetris game; a shopping cart; a web app that uses machine learning to predict what crop is best suited to plant based on soil composition; a smart home and a smart farm with IoT. On the last day of the workshop, each team presented the big picture of their projects in the morning, adopting a slides style format. This was followed by demos in the afternoon with the volunteer team moving around, inspecting their codes, and asking lots of questions.

## Conference for women in tech

The aim of this one-day conference was to inspire the women attending our programming workshop with the stories of other trailblazing women in tech. In addition, we wanted to identify barriers stalling their growth in the field. The conference was organised by a group of women who have benefitted from one of our previous activities, and it was initially supposed to run as a physical event; but thanks to resources provided by our host, we were able to run it as a hybrid event with 10 virtual and about 110 physical attendees. The conference featured an engaging panel session with four Nigerian women in tech, a lively and entertaining Kahoot quiz competition, identifying barriers session, and kindness session. Photos at <https://www.csafrica.org/women>.

The identifying barriers session was a tearjerker, intimate, and uplifting, as participants shared barriers anonymously via Padlet and reflected on their experiences of being bullied by the opposite gender that STEM is only for men, not having access to resources, a stimulating environment, proper mentoring, imposter syndrome, family pressure, etc. We had a nursing mother with a five-month-old baby share her story of how she is striving for more and needed to leave her baby at home with her supportive husband, only to be bullied by some men that she is bad mother!

We all recognised that there is a massive movement regarding closing the gender gap in STEM; yet, we still have a long way to go, most especially by sensitising men and women alike towards being better advocates. The conference ended on a high note with attendees writing kind words to someone in the room, everyone gathered their notes in a big pile that was shuffled, and they all picked a note on their way out with big smiles on their faces as they absorbed the message.



## Outcomes and Impact

At the end of the workshop, majority of the beginner learners were able to code solutions to simple problems from scratch by pulling together the basic concepts of Python programming, while the advanced learners were able to demonstrate good understanding of the learning outcomes in their specialisation track. This success was measured via their engagements with the teaching team, their attempts during the hands-on session, and the impressive outputs of their group projects. Out of the 194 selected participants, 163 of them fully participated during the two weeks of teaching and made it to the project phase of the workshop with 46% being women, which we are very proud of. Moreover, participants reported improved confidence, teamwork, communication, and problem-solving skills. It was moving to see these young learners feeling more confident with their goals, striving for more, and reaching for higher grounds – like a fire had been ignited in them.

We also had a post-workshop survey for which we received 133 responses. We asked our participants how satisfied they were with different aspects of teaching (materials, exercises, content delivery, and one-to-one help), rating each item with a score between 0 (extremely dissatisfied) and 100 (extremely satisfied). The average satisfaction across all respondents was above 90 for the various aspects of teaching. The welfare support was also reviewed by the participants, with an average satisfaction score of 95 for the NitHub facilities, 91 for the University of Lagos provided accommodation, 85 for the daily lunch provision, and 81 for the childcare support.

While the primary goal of our workshop was to empower our participants with Python skills, we have also had the chance to work closely with eight local volunteers from across Nigeria who are going to deliver activities in the next few months. Some of their proposed activities include careers' event, outreach to local schools, and further programming training for people in their community who are beyond our reach.

## Challenges



Donations from our generous sponsors and the enabling environment provided by the University of Lagos made it possible for us to select more participants (than in previous years) who would otherwise not have been able to attend our workshop for several reasons, including, lack of personal laptop, lack of funds to cover accommodation, travel, and childcare. However, this large pool of participants led to new set of challenges, chief among them being that we were unable to fit all the introductory learners into one room. In addition, about 30% of our learners did not come to the workshop with a personal laptop. So, they were assigned to a computer lab that was equipped with 45 desktop computers, the NitHub provided temporary laptops for some, and everyone with a laptop was assigned to another room. As a result, the track lead in charge of the introductory learners was having to shuffle between two rooms (repeating the same lesson twice, every day). Thanks to the help of the volunteers and the NitHub team, we were able to manage this challenge. Another persistent challenge was the problem of feeding about 200 people every day – it was a logistical nightmare which sometimes cuts into teaching time especially when lunch is served late.

## Acknowledgment



We would like to acknowledge individuals at the University of Glasgow and the NitHub, University of Lagos, for their tireless effort which led to the success of CSA Africa 2022. In addition, we would like to thank the University of Lagos management for their impressive leadership, generosity, and for making everyone involved in CSA Africa 2022 feel right at home in their institution. Finally, our sincere gratitude to our sponsors. Thank you very much for your support and donations<sup>2</sup>, which enhanced the delivery of our activities, impacting the lives of 163 young Africans.



Morgan Stanley



World's  
Smallest  
Projection  
Display



---

<sup>2</sup> We remark that all funds were transferred to the University of Glasgow pocket, and the University's finance team checked all receipts tied to our workshop expenses before approving claims.