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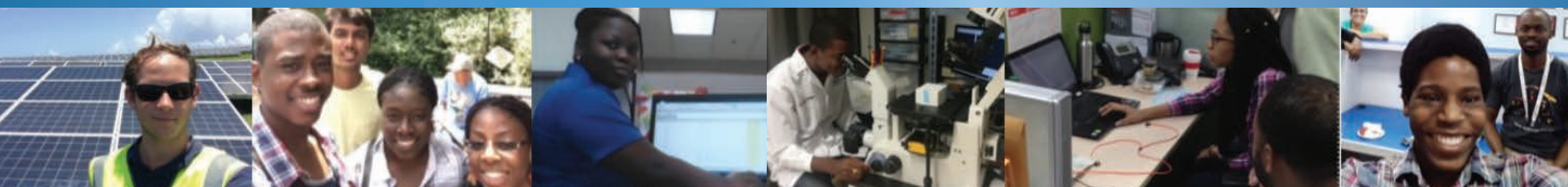
# CADSTI-NE

## Newsletter

'Promoting science and technology for Caribbean youth'

November 2017

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## President's Message



**Dinah Sah - President**

Dear Friends and Supporters  
of CADSTI-NE,

It's a great pleasure to share with you the highlights of the 2017 CADSTI-NE summer internship program which was a tremendous success. We served the highest number of SPISE graduates yet – 15 student interns working at 7 companies in Massachusetts, Connecticut, Florida, Barbados, Trinidad

and Calgary, as well as conducting research in California! The CADSTI-NE organizing committee worked tirelessly throughout the year, meeting nearly every Sunday morning to raise funds for, plan, coordinate and implement this program. We could not have done any of this without your support. Thank you for sharing in our vision to provide these amazing opportunities in science and engineering for our very gifted Caribbean students! ■

Sincerely yours,

Dinah Sah, PhD, CADSTI-NE President

### CADSTI-NE Leadership Team

Karen-Leigh Edwards, PhD, MBA  
Richard Fauconier, PhD  
Lori Fitz, PhD  
Paul McLean, PhD

Tony Rossomando, PhD  
Dinah Sah, PhD  
Joshua Sheldon, MBA  
Cardinal Warde, PhD

## About CADSTI-NE

The Caribbean Diaspora for Science, Technology and Innovation - New England (CADSTI-NE) is a non-profit 501 (c) (3) organization focused on promoting science and technology for Caribbean youth.

Our overall mission is to assist in diversifying the economies of the Caribbean by harnessing science and technology for economic development, and in doing so help raise the region's standard of living. CADSTI-NE's major projects are to:

(1) Organize and sponsor internships for Caribbean students at biotech and high technology companies in the U.S. and the Caribbean, and (2) Support the Student Program for Innovation, Science and Engineering (SPISE), an intensive four-week enrichment residential summer program for gifted Caribbean high school students.

These projects are made possible through generous donations from organizations and individuals in the Diaspora and the Caribbean. ■

## 2017 Internship Program

CADSTI-NE created internship opportunities for 15 students from the Caribbean, who are studying STEM subjects ranging from biochemistry, chemistry, applied math, electrical and mechanical engineering to physics. These opportunities were made possible due to generous donations from supporters in the Diaspora and Caribbean, and partnerships with US, Canadian and Caribbean companies. ■

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# Biotechnology and Chemical Engineering

- **Biochemistry major at Trent University, Canada**
- **Voyager Therapeutics, Cambridge, Massachusetts, USA**

Shamone's internship at Voyager Therapeutics served a dual purpose in furthering her career aspirations in biotech: (1) validation of her chosen career path, and (2) improvement of her skill sets and understanding of drug discovery. Through rotations in different departments at Voyager, Shamone was able to learn many new techniques such as DNA extraction and droplet digital PCR which enabled quantification of vector genome levels, and immunohistochemical staining. She observed direct application of her genomic work to interpreting results from experiments as well as designing subsequent experiments.

In addition to her laboratory work, Shamone attended group meetings, seminars, journal clubs and an all company meeting where she was introduced to the entire staff. The diverse hands-on experience, techniques and group meetings have prepared Shamone for her research project this fall. As Shamone put it: "I really enjoyed the interactive feel of the small company and how involved all team members were on projects. Their dedication and value placed on teamwork were definitely highlights of my tenure." ■



**Shamone Fine (Jamaica)**



**Terrikia Benjamin (Antigua)**

- **Biochemistry major at University of Rochester, USA**
- **Vape Manufacturing Laboratories (VML), Branford, Connecticut, USA**

Terrikia spent her 2017 summer interning at VML where she had the opportunity to learn various aspects of the vape product development process through rotations in formulation, manufacturing and analytical quality control. She was also able to gain an understanding of the regulatory standards around vape products and associated sales practices. In addition, this internship enabled Terrikia to have a unique view into the entrepreneurial approach and business principles involved in a startup company.

Overall, Terrikia's internship enabled her not only to understand the role of science in the manufacture of a product but also its purpose as part of a business venture and application in a newly developing industry. In her own words: "I took away a lot of lessons about operating a startup and skills that I will be able to apply to my future professional interactions. Everyone was very friendly and welcoming to me and they made me

feel like part of the organization so I also feel like I have gained a VML family." ■



# Biotechnology and Chemical Engineering

- **Mechanical Engineering major at Howard University, USA**

- **Foursquare Rum Distillery, Barbados**

Melissa has an interest in mechanical engineering and approached her internship at Foursquare Distillery with this perspective. Her internship included hands-on experience in each of the departments that work together to produce the final products at Foursquare Rum Distillery.

"Although the work itself was not always relevant to mechanical engineering, I learned about building soft skills and professional skills, and working in a new geographical and cultural setting. I was able to work in several areas of the plant, such as the lab, the control room, and bottling, thereby getting a full understanding of the overall process. The highlight of my last week was learning to drive a forklift. After my first lesson, I was made to carry a human passenger up about 2 stories as well as through narrow gates (which I did successfully). I'm proud that I made a good impression and was able to explore the island during the weekends. I am glad to say that I achieved the goals that I set at the beginning of this internship." ■



**Melissa Douglas (Jamaica)**

*Pictured is Melissa working with the barrels included labeling, recording, and painting the date. The only thing left to do was to make a barrel from scratch!*



**Fitzroy Wickham (Jamaica)**

- **Neuroscience major at Wesleyan University, USA**

- **Foursquare Rum Distillery, Barbados**

"I quickly fell into my daily routine of collecting and testing samples in the lab before lunch and working in the control room in the latter portion of the day. I learnt how to test for alcohol strength and empty the barrels. I collected and tested samples from the boiler, still, cooling tower and white stillage in the mornings and made my way to the control room after lunch, where I took Brix samples from the fermenters. On several occasions, I would make visits to the Bottling Plant and assist with packaging the rum bottles." ■

*Pictured is Fitzroy (on right) with Foursquare staff.*

# Energy Industry

- **Electrical and Biomedical Engineering major at McMaster University, Canada**

- **Peloton, Calgary, Canada**

Ryan interned at Peloton to gain a better understanding of the application of mechanical and chemical engineering software to the oil and gas industry, to become knowledgeable in all of Peloton's software, and to become trained in their flagship product, WellView (which is used by over 70% of the world's oil companies). His project was to convert 264 paper well files into accurate down-hole digital schematics by entering data into their database. He also tested Peloton's Cloud solution, as he carried out his project on their new online interface.

"Peloton is wonderful place to work and the staff are friendly and helpful. This particular internship got tedious at times but I am glad to be able to speak to the programmers and support staff and observe their activities when I am allowed to."

"I believe that someone seeking a future in Petroleum Engineering would find this internship ideal. WellView is used by over 70% of the world's oil and gas companies. Also, the accommodations are nice and I enjoyed the Stampede festivities." ■



**Ryan De Riggs (Grenada)**

*Pictured above is Ryan on a site visit.*



**Jacob Smith (Barbados)**

- **Mechanical Engineering major at University of Bath, UK**

- **Emera Barbados**

"This was my first exposure to the internal workings of a large corporation and I was very impressed by its structure and how well the independent sections integrated with their counterparts all over the island. The systems in place were clear and all the staff members I encountered seemed conversant in what needed to be done and able to operate effectively with minimal supervision."

"I very much enjoyed the hands-on elements of my internship. I felt a heightened sense of accomplishment and thoroughly enjoyed the camaraderie of the staff members I worked alongside."

Jacob worked with the engineers and company software to optimize the performance of the grid steam generators and maintenance, energy demand computer modeling, transformer installation, renewable energy photovoltaic plant. ■

# Computer Sciences



**Josh Henry (Grenada)**

- ***Mechanical Engineering major at University of the West Indies, St. Augustine, Trinidad***
- ***Trinidad Systems Limited, Trinidad***

The goals of this internship were to enable Josh to learn different types of programming languages, networking, firewall security as well as the other intricacies of being IT support for a large company.

Josh worked with another intern, Abigail Scott, to learn and work on Python code both separately and together. He stated: "This was a learning experience, not only because I had not used Python before, but because it exposed me to a method where a team works both together and separate to accomplish coding projects in industry. The project in this case was the creation of a Tic Tac Toe game from base code using no libraries and utilizing permutations to find the solutions." ■

- 
- ***Chemistry, Biology, Math and Physics major at St. Vincent and the Grenadines Community College***
  - ***Trinidad Systems Limited, Trinidad***

"This internship gave me firsthand experience in the many areas of ICT at TSL. These areas include network security, structured cabling, networking, wireless communications, audio/video technology, RFID, cloud computing, software development and support. The programming in C and Python that I was able to do at TSL helped to rekindled my love for programming and allowed me to integrate mathematical knowledge and logic in code. I was exposed to the critical thinking required for troubleshooting problems as well as how tedious the entire process can be. The employees at TSL were extremely friendly; they welcomed us in their closely knitted family which made group work even more collaborative." ■

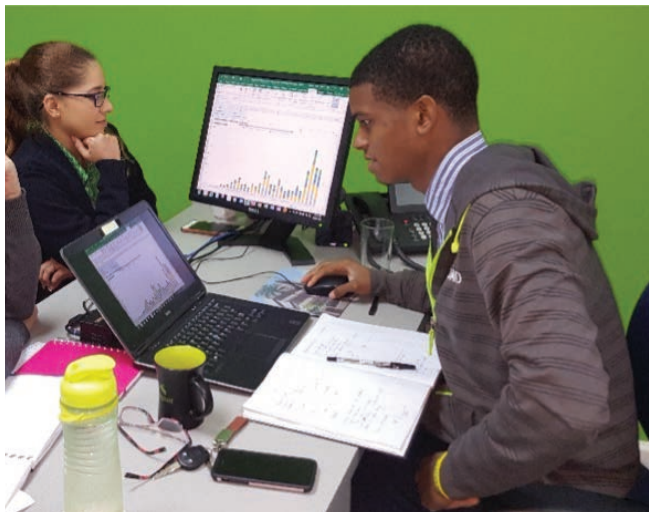


**Abigail Scott (St. Vincent)**

*Pictured is Abigail installing and configuring OneDrive at TSL.*



# Computer Sciences



**David Serrant (Trinidad)**

- **Mechanical Engineering major at University of the West Indies, St. Augustine, Trinidad**

- **Sagicor Life Insurance, Trinidad**

David spent his time at Sagicor in the Operations Optimization and Analysis Department, where much of his work required the use of proprietary company procedures and specialized software. He spent a lot of time practicing to become proficient in the use of the company's software tools, and made sure to complete his assignments on time. Asking questions to clarify his tasks and focus his performance were crucial to his success at the job. He gained an appreciation for the rigorous requirements of operations optimization and analysis, and took the time to understand how that department's activities were coordinated with those of the other departments.

"The company had a very hospitable environment and working facilities that were very orderly and well taken care of.

... When I was in need of assistance with respect to software issues their designated IT worker or qualified persons responded in a very kind manner. I was pleasantly surprised to see that the company also takes interest in ensuring that their workers maintain a good healthy exercise lifestyle as this increases productivity among workers." ■

- **Teaching science and applying to university during gap year**

- **Sagicor Life Insurance, Barbados**

"My internship was an amazing experience and prepared me for the work force as it was my first job and I planned to work this year. It truly prepared me for work life and university life since I lived on my own for the first time both on dorm and in an apartment. It gave me the opportunity to manage money and fend for myself. I want to thank SPISE and the CADSTI for the opportunity and hope to be able to benefit from such an experience again." ■



**Kyra Richards (Dominica)**

*Pictured right is Kyra giving a speech.*

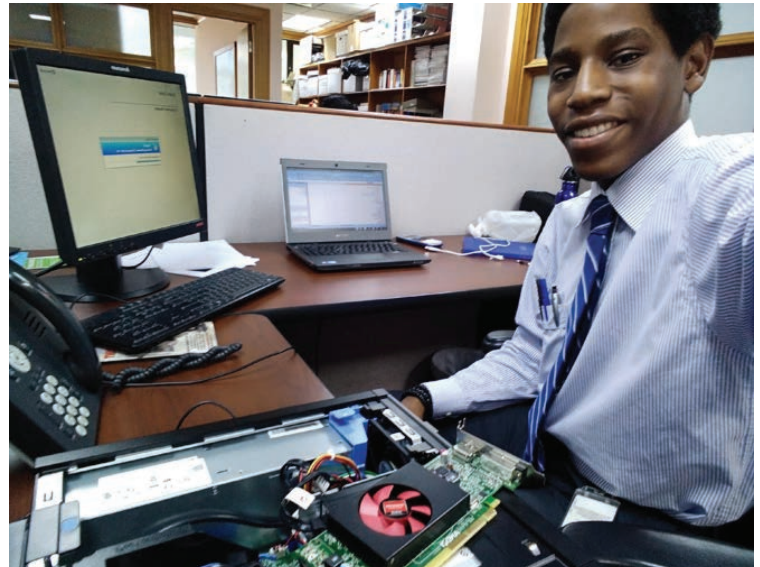
# Computer Sciences

- **Electrical Engineering major at University of Toronto, Canada**
- **Sagicor Life Insurance, Barbados**

Kamau worked in the IT Services Department on large-scale projects in both IT support and server administration. He learned two entirely new programming languages on the job (C+ and SQL), and he acquired “a whole lot of practical skills working with servers, computer hardware and software as well as database creation and management”.

During the internship Kamau used system-centred computer management (SCCM) automation to build or refresh desktops and laptops for end users. Other projects included large-scale server upgrades, and using his knowledge of database programming languages such as SQL (Structured Query Language) to organize data from the Help Desk to create reports and charts. He also used his programming skills to produce reports that provided useful insights for root cause analysis. He was able to work directly with customers to offer technical aid and services, and to resolve computing problems from Help Desk requests.

“This has been an immensely rewarding experience, I have gained a lot in my time at Sagicor. ... Working with the Server Administration on the Disaster Recovery exercise required that I integrate into their team and work smoothly with a team which had already been functioning as a unit for several years, it seemed daunting at first but turned out fairly easy as they were very happy to work with me. With IT support, on the WAN/LAN infrastructure upgrades on the branch; this was the most fun of the three projects. We spent two very late nights wiring in the server room and database centre and I learnt a great deal about how the network’s hardware side functions to deliver service to the entire Barbados branch as well and communicate with the outside internet.” ■

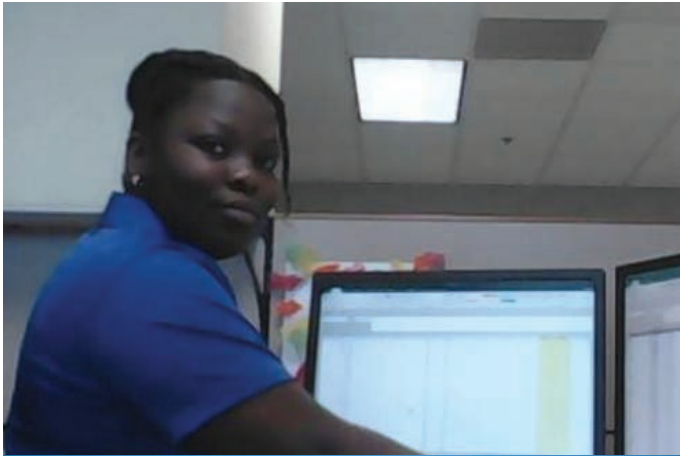


**Kamau Bridgeman (Barbados)**

*Pictured above is Kamau imaging a tower to be used to test his plan.*



# Actuarial Science



**Obe Joseph (Dominica)**

*Pictured above is Obe designing Excel workbooks to compare field information from 3 files in preparation for an experience study.*

- **Industrial Engineering major at University at Buffalo SUNY, USA**

- **Sagicor Life Insurance, Tampa, Florida, USA**

Obe created spreadsheets for reinsurance rates by the actuaries at Sagicor. She also compared model information coded in AXIS to pricing assumptions on file, identifying inconsistencies, using GGY Axis, Access and Excel to compare rates. She also modified a workbook to compare Valuation Basic Tables (VBT) Relative Risk (RR) information from the SOA website, to the model in GGY Axis and created two Reinsurance Commission Tables based on quotes from two reinsurance companies. Her designated task for the internship was to work on a partial withdrawal experience study. She started managing company data using Access and Excel, for analysis.

For some fun on the job, Obe attended a baseball game with her colleagues at the Tropicana Field.

"This was a well-rounded experience. Most, if not all, of the learning was hands-on. The employees are enthusiastic about their work and always willing to offer an explanation, or guidance in the right direction. The tasks given were fun and challenging. The skills I acquired are invaluable, and I can easily build on them. The enrollment in the LOMA course kept me occupied when activity slowed down for me. Also, I spent some time with workers from other departments. This surpassed my expectations." ■



**Quilee Simeon (St. Lucia)**

- **Applied Math and Neuroscience major at MIT, USA**

- **Sagicor Life Insurance, Barbados**

Quilee first spent time in the Death Claims department, where he updated one of the company's death logs. In carrying out his responsibilities in the department, he learned a lot about common causes of death in the region and a great deal of medical terminology and other technical terms associated with the end of life.

Subsequent to Death Claims, Quilee worked in the Reinsurance Department, where he expressed a desire to be involved in something more analytical and was assigned his mentor's entire workload for the billings period! His supervisor noted that he had made no mistakes with the premium calculations.

Quilee also had time for fun outside the office, hanging out with friends from SPISE who lived in Barbados, as well as SPISE alumni friends from other islands who were doing internships in Barbados. "My internship at Sagicor was overall very pleasant". ■



# Academic Research

***STARS (Summer Training Academy for Research Success) is an 8 week residential program at the University of California at San Diego (UCSD) which offers a rigorous research opportunity with UCSD faculty, and graduate school preparation workshops.***



**Benedict Sukra (Guyana)**

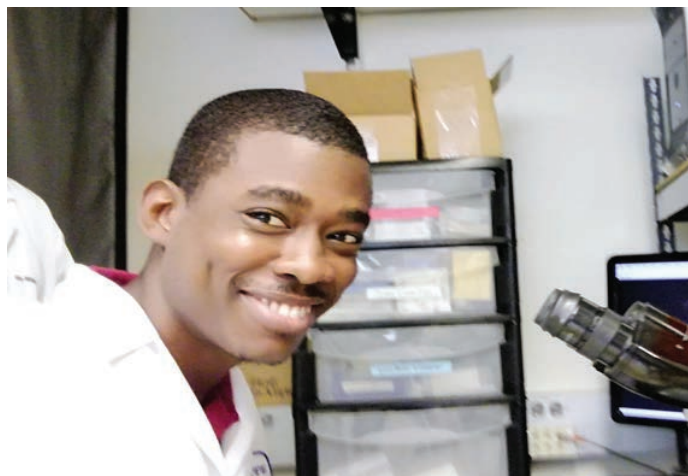
• ***Physics major at University College London & STEM coach at CADSTI-UK Caribbean STEM Coaching Club***

Benedict studied dark matter and his research project included analyzing data from the state-of-the-art XENON dark matter detector at the Laboratori Nazionali del Gran Sasso in Italy.

Benedict constructed machine learning algorithms (Artificial Intelligence) using Google's open source Tensorflow software to develop and train a neural network to optimize spatial resolution of the signals from the detector.

This research requires proficiency in several computer programming languages and Benedict was able to learn ROOT- a programming environment developed by CERN that is designed for analysis for particle physics experiments. TensorFlow is a Python machine learning module and both ROOT and the Python version (pyROOT) were needed to advance his project.

"I'd like to continue to work on this after the internship. STARS was a tremendous opportunity to get involved in academic research." ■



**Shaquielle Dias (Jamaica)**

• ***Medicine major at University of the West Indies, Mona, Jamaica***

Shaquielle has strong interests in biomedical engineering research and jumped right into working on a research project in the field of cartilage repair. Some of the specific laboratory skills that Shaquielle learned for this project included image processing using DataViewer and MATLAB imaging techniques and laboratory documentation.

Results from his project have been submitted as an abstract for presentation at an international scientific conference. He is the first author as an acknowledgement of his contributions.

"I wholeheartedly recommend the STARS to any student who is contemplating a future in research. It has been a comprehensive summer in not only providing research experience but also preparing me for applying for graduate school and thriving while in a program. The STARS team also ensured that we developed outside the academic setting which influenced my ability to interact across cultural boundaries." ■

# SPISE Summer Program



Group shot of SPISE 2016 students.

**The Student Program for Innovation in Science and Engineering** (SPISE) is an annual 4 week summer residential program in Barbados for Caribbean high-school students who are gifted in Science, Technology, Engineering and Mathematics (STEM), and interested in studying and exploring careers in these disciplines. SPISE is modeled after the well-known and highly successful MITES program at MIT for which Professor Cardinal Warde also serves as the Faculty Director. SPISE students are totally immersed (24/7) in university-level calculus, physics, biochemistry, entrepreneurship, one-Caribbean studies, and hands-on projects in robotics or renewable energy, and computer programming. The SPISE environment discourages rote learning and teaches students how to focus on understanding and applying the fundamentals so as to achieve mastery of the material, and thus be able to solve complex problems. The value of teamwork (learned in the hands-on projects) is yet another essential skill that is emphasized, along with proactive time-management skills. Instructors in the SPISE include university professors from the Caribbean and the Diaspora (including MIT), and senior

management professionals from leading biotechnology and pharmaceutical companies in the Diaspora. The program culminates with student project competitions in which each team first gives an oral presentation of their hands-on project before demonstrating the workings of their project to the public.

To date, SPISE has served 109 students from 16 Caribbean countries. SPISE graduates from the 2012-2016 classes are now enrolled at the world's top science and engineering universities including MIT, Stanford, Harvard, Columbia, Dartmouth and UWI. Most of these students have substantial financial aid packages, and some have full scholarships. *Further details can be found at <http://caribbeanscience.org/projects/spise.php>.*

Since its inception, the CADSTI-NE summer internship program has served a total of 28 SPISE graduates, including 4 student interns in 2014, 3 in 2015, 6 in 2016 and 15 in 2017. ■

# 2017 Internship Hosts and Sponsors

Sincere thanks to our partner organizations, who devoted time and resources to planning for, on-boarding and mentoring the student interns.

Internship Host Organization	Company/Program Focus
 <b>Emera Caribbean Barbados</b>	Energy company providing electrical power for several Caribbean islands, including renewable energy.
 <b>Foursquare Rum Distillery Barbados</b>	Manufacturing rum with state-of-the-art equipment.
 <b>Peloton Calgary, Canada</b>	Bringing the world's best well data and drilling software to small, mid-size and large oil and gas companies.
 <b>Sagikor life Insurance Barbados, Trinidad, Tampa, FL, USA</b>	Providing multiple products to improve the lives of its customers.
 <b>STARS program, University of California, San Diego, USA</b>	Summer research academy with UCSD faculty, and graduate school preparation workshops.
 <b>Trinidad Systems Limited Trinidad</b>	Providing end to end solutions in all fields of Information and Communication Technology.
 <b>Vape Manufacturing Laboratories Branford, CT, USA</b>	Applying high manufacturing quality standards to e-liquids.
 <b>Voyager Therapeutics Cambridge, MA, USA</b>	Developing life-changing gene therapies for people living with severe neurological diseases.

*We also thank our numerous individual and corporate donors who made these internships possible.*

## SUPPORT CADSTI-NEW ENGLAND!

To make a U.S. tax-deductible donation to CADSTI-NE, please go to:  
<http://cadsti-ne.org/donations.html>



# **Caribbean Diaspora for Science Technology & Innovation New England**



**Promoting science and technology for Caribbean youth**

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