

APSC 1001 & CS 1010- Fall 2021:

Final Raspberry Pi and Python Group Project

Select a project idea and
implement a Raspberry Pi-based
application

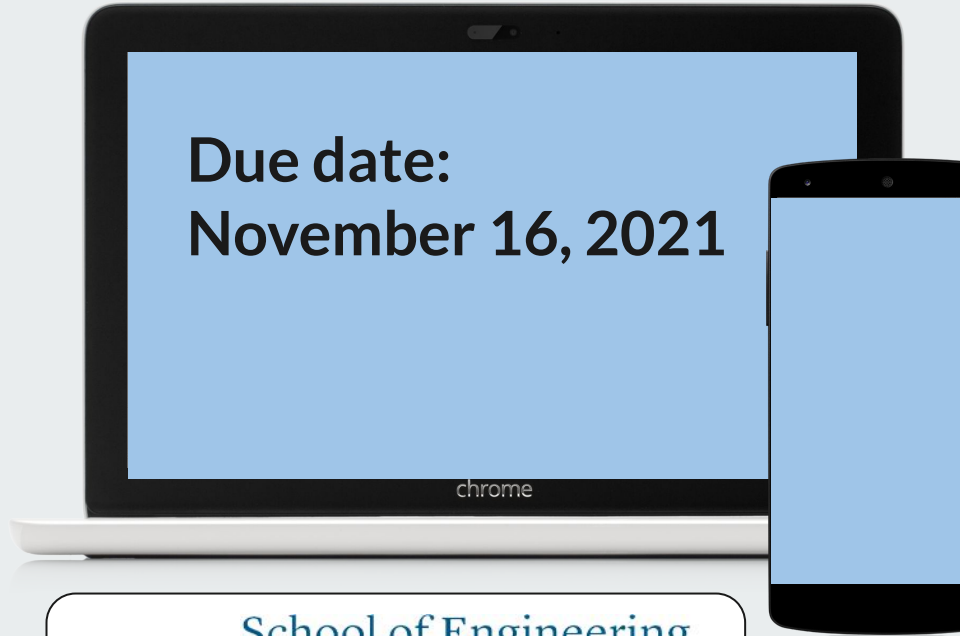
Prof. Kartik Bulusu (MAE Department)

Teaching Assistants:

Katya Karpova & Sara Tenaglio (BME Department)
Zachary Stecher (CEE Department)

Learning Assistants:

Ethan Frink & Alexis Renderos (MAE Department)
Jon Terry, Jack Umina & Olivia Legault (CS Department)



School of Engineering
& Applied Science

THE GEORGE WASHINGTON UNIVERSITY



Teamwork

Throughout classes and career, you will need to work in small teams to complete a product or a solution

- **Come up with a teamwork plan**
 - **Create a workflow** over a virtual or in-person meeting
 - **Designate one person to be a “scribe”**
 - DeepNote allows to **collaborate in real-time**
 - Instruction team can help you with the **Raspberry Pi Hardware**
 - You can contact us during office hours
 - Or make an appointment if it works better
- **Using Slack to communicate with your team and instructors is essential**
- Each person can make small updates individually and meet to decide on one
 - Your methods are up to you! **But we need to see a contributions from each group member.**
- **In the end, we just want to see a completed project**

Be communicators and let the instruction team mentor you!

Group 3: Henry Ryan, Seeam Khan, Patrick Burke
Group 4: Adrene Navare, AnnaMaria Vargas, Sebastian Cole Driskell

Project mentor: Jon Terry (Learning Assistant)
Email: terry82@gwmail.gwu.edu;

Option 1:

Web scraping sports data using Python

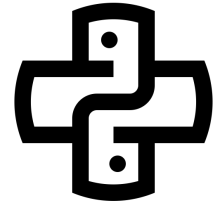
*“Web scraping, web harvesting, or web data extraction is **data scraping** used for **extracting data** from **websites**.”*

Source: https://en.wikipedia.org/wiki/Web_scraping

- Write a Python program to web scrape a popular sports web page
 - Fetch data and extract from it some basic statistics.
 - Plot your data to show trends
 - Discuss your findings graphically
- This project involves only Python programming
- **Software:** DeepNote
- **Hardware:** no requirements (porting on Raspberry Pi is optional)



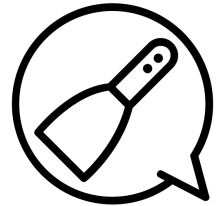
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Group 15: Leen Al Rajih, Emily Garcia, Dahab Amen
Group 16: Khalid Hamzah, Liu Schmid Matias, Michael Yoo
Group 17: Nyema Lindsay, Scott Pettyjohn, Oscar quintanilla

Group 18: Yuchen He, ZiyangYou, Jake Anselowicz
Group 19: Olamide Treasure Oluwalade, Paul Bianco, Claire Moore
Group 20: Kidist Bekele, Mark Parrish, , Matthew Rosica
Group 21: Adriana Vidal, Marvin Lennart Martens, Warren Nguyen
Group 29: Liza Mozolyuk,, Oliver Krisetya, Lauren Schmidt, Renaud Fred Noubieptie Kamgang

Project mentors: Katya Karpova (Learning Assistant) and Prof. Kartik Bulusu

Email: katyakarpova@gwmail.gwu.edu; bulusu@gwu.edu

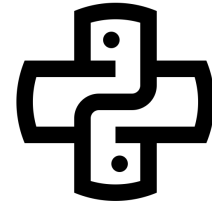
Option 2:

Sense HAT-based personal weather station for the SEH Greenhouse

- Use a senseHat to build a Raspberry Pi-based weather station
 - Fetch pressure, temperature and humidity data.
 - Plot your data to show trends
 - Discuss your findings graphically
- **Software:** Thonny Python IDE
- **Hardware:** senseHat, Raspberry Pi 3B+
- **Location:** SEH Greenhouse or Tompkins Hall 4th floor



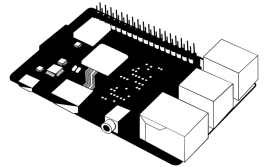
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Group 6: Victor Nin, William Mai, (Q) Kweku Awuah

Group 12: Jawad Hanif, Quinton Tang, Theresa Le

Group 13: Charlotte Ketterson, Zachary Rahbar, Ozzy Simpson, Steven Harari

Group 22: Elaine Ly, Onur Coban

Project mentor: Jack Umina (Learning Assistant)

Email: jumina@gwmail.gwu.edu

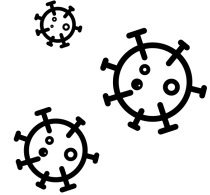
Option 3:

Web scraping COVID19 data using Python

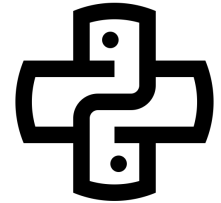
“Web scraping, web harvesting, or web data extraction is [data scraping](#) used for [extracting data](#) from [websites](#).”

Source: https://en.wikipedia.org/wiki/Web_scraping

- Write a Python program to web scrape a COVID19-data from a reliable website
 - Fetch data and extract from it some basic statistics.
 - Plot your data to show trends
 - Discuss your findings graphically
- **Software:** DeepNote
- **Hardware:** no requirements (porting on Raspberry Pi is optional)



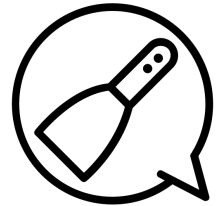
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Group 7: Stephanie Berthin, Will Huizinga, Mazen Saadi

Group 8: Brendan Jarmusz, Georgette Encinas, Ferehan Ibrahim

Group 9: Mariam Abou El Maali, Yusef Jawad, Sheila Garrity

Group 11: Arman Naseh, Jacob Ifrah, Benjamin Clair

Group 28: Adam Binder, Tharun Saravanan, Chloe Truong

Group 30: Rhys Chambers, Shantao Xu, Joshua Kweon

Group 33: Faris Maan, Joseph Beach

Project mentors: Alexis Renderos (Learning Assistant) and Olivia Legaul (Learning Assistant)

Emails: alexisrenderos@gwmail.gwu.edu; olegault@gwmail.gwu.edu

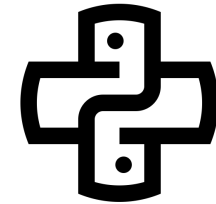
Option 4:

Raspberry Pi-based security camera

- Use a Pi NoIR camera to build a Raspberry Pi-based security camera
 - Track motion of objects
 - Save images
 - Send an alert
 - Discuss your findings
- **Software:** Thonny Python IDE
- **Hardware:** Pi NoIR Camera, Raspberry Pi 3B+, Sense HAT (Optional)
- **Location:** TBD in SEH or Tompkins Hall



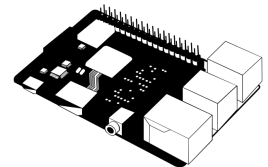
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Group 5: Marcos Aguiar, Nicolo Krueger, Mudrakat Durosinmi, Jonny Ciccerio

Group 32: Daniel Hillenburg, Nanah Wasserman

Project mentors: Katya Karpova (Learning Assistant) and Prof. Kartik Bulusu

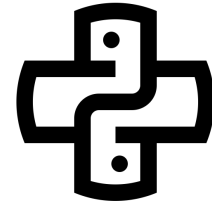
Email: katyakarpova@gwmail.gwu.edu; bulusu@gwu.edu

Option 5: Sense HAT-based personal weather station for any SEH location

- Use a senseHat to build a Raspberry Pi-based weather station
 - Fetch pressure, temperature and humidity data.
 - Plot your data to show trends
 - Discuss your findings graphically
- **Software:** Thonny Python IDE
- **Hardware:** senseHAT, Raspberry Pi 3B+
- **Location:** TBD in SEH



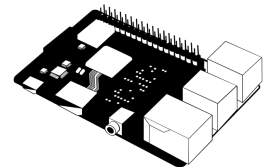
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Group 24: Felipe Garcia, Lowell Pioquinto, Alast Samimi-Darzi

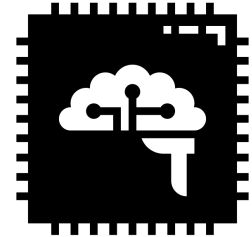
Group 25: Alessandra Williams, Dominique Lynch, Arnur Maratov

Project mentor: Jon Terry (Learning Assistant)

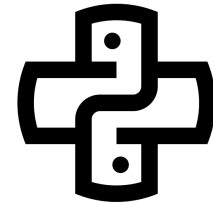
Email: jterry82@gwmail.gwu.edu

Option 6: Monitor CPU performance of the Raspberry Pi 3B+

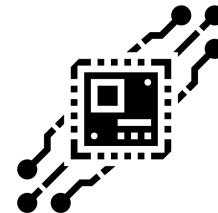
- Monitor the CPU usage on the Raspberry Pi
- Write a Python program
 - using *psutil* library
 - to get CPU & memory usage,
 - create live graph results
 - Discuss your findings graphically
- Software: Thonny Python IDE
- Hardware: Raspberry Pi 3B+



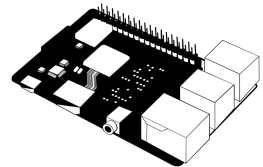
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Group 1: Grissell Barajas, Talia Novack, Andy Amaya-Otero

Group 2: Matthew Ostin, Mateo Flores, Maya Bardin

Group 10: Amanda Scoville, Jeana Joo, Christian Friedrich Tarrasch



Group 14: Issouf Diarrassouba, Sameen Ahmad, Solomon Ace Drucker

Group 23: Massimo Pavan, Ivan Yu

Group 26: Aarifah Ullah, Hoai Son Nguyen, Gustavo Pedraza Jr

Group 27: Jordan Yee, Thomas Riffe, Dominique Porte, Enzer Kurshid

Group 31: Diana Zepeda-Benitez, Yuqi (John) Zhang, Khoi Nguyen Su

Project mentors: Sara Tenaglio and Zachary Stecher (Teaching Assistants)

Email: sara_tenaglio@gwmail.gwu.edu; zstecher@email.gwu.edu



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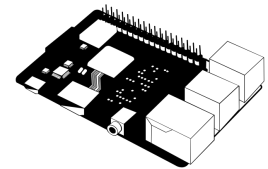
Option 7:

Raspberry Pi-based motion detection in the SEH greenhouse

- Use a Pi NoIR camera to build a Raspberry Pi-based motion tracker
 - Track motion of objects next plants such as venus fly traps
 - Save images
 - Send an alert
 - Discuss your findings
- **Software:** Thonny Python IDE
- **Hardware:** Pi NoIR Camera, Raspberry Pi 3B+, Sense HAT (Optional)
- **Location:** SEH Greenhouse



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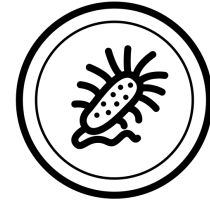
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Project mentors: Prof. Kartik Bulusu and Sara Tenaglio (Learning Assistant)

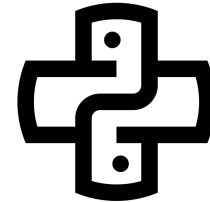
Email: bulusu@gwu.edu; sara_tenaglio@gwmail.gwu.edu

Option 8: Sense HAT-based incubator climate monitoring system

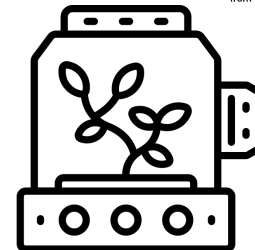
- Use a Sense HAT to build incubator climate monitoring system for tissue cultures for biomedical research
 - Fetch pressure, temperature and humidity data.
 - Plot your data to show trends
 - Discuss your findings graphically
- **Software:** Thonny Python IDE
- **Hardware:** Sense HAT, Raspberry Pi 3B+, Pi NoIR Camera (optional)
- **Location:** TBD in SEH



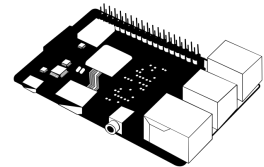
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