## English Version

The following questionnaires were attachments to the research project “Experiences from the V Python Workshop for Biological Data” and were subsequently drafted in Google Forms online format.

1. **ATTACHMENTS: Data Collection Instruments (Questionnaires)**

**Attachment 1 - Registration Form - V Python Workshop for Biological Data (2022)**

"*This is the registration form for the 'V Workshop on Python for Biological Data - 2022 edition.*’

The guidelines for the Selection Process are available on the event's website (<https://wpdb2022.netlify.app/>).

The list of selected participants for the event will be announced in August 2022.

*Good luck!”*

Fill-in details:

1. Email address (Option: provide a valid and frequently used email address)
2. Full name
3. Preferred name (if different)

DEMOGRAPHIC CHARACTERIZATION:

1. Gender identity (cisgender woman, cisgender man, transgender woman, transgender man, non-binary, Other, Prefer not to classify, Prefer not to answer)
2. Year of birth (4 digits)
3. Race/Ethnicity (Yellow, White, Indigenous, Brown, Black, Other, Prefer not to classify, Prefer not to answer. \* If answering "Other," please specify.)
4. State of birth in Brazil (options) or country if not Brazilian (in others)
5. State in Brazil where currently residing (options) or country if not in Brazil (in others)
6. Person with Specific/Special Needs, PwD, or other condition (No, Low vision or subnormal vision, Blindness, Deafness, Physical disability, Intellectual disability, Developmental global disorder, Other. \*If answering "other," please specify.)

CURRENT ACADEMIC AND PROFESSIONAL BACKGROUND

1. Institution
2. Degree (options)
3. Course
4. Field of expertise (if applicable) \*Select one option below

**2.00.00.00-6 Biological Sciences:**

2.02.99.00-1 Genetics

2.05.99.00-5 Ecology

2.10.99.00-6 Pharmacology

2.11.99.00-0 Immunology

2.12.99.00-5 Microbiology

**4.00.00.00-1 Health Sciences:**

4.01.99.00-2 Medicine

4.02.99.00-7 Dentistry

4.03.99.00-1 Pharmacy

4.04.99.00-6 Nursing

4.05.99.00-0 Nutrition

**5.00.00.00-4 Agricultural Sciences:**

5.01.99.00-5 Agronomy

5.02.99.00-0 Forest Resources and Forest Engineering

5.04.99.00-9 Animal Science

5.05.99.00-3 Veterinary Medicine

5.06.99.00-8 Fisheries Resources and Fisheries Engineering

**9.01.99.00-6 Interdisciplinar**

Biotechnology

*To justify participation, we consider the candidate's need to analyze biological data. It is important to note that candidates are not required to provide the title, hypotheses, or summaries of their research projects if they are confidential; however, we encourage them to use the space provided for "Summary of Research Project" to justify the need for data analysis in a similar context.*

1. Title of research project (if applicable and not confidential)
2. Hypotheses of research project (if applicable and not confidential)
3. Summary of research project (if applicable and not confidential)
4. Funding agency or company (if applicable) (Options: CNPq, CAPES, FAPESP, other)
5. Name of Advisor or Supervisor (if applicable)
6. Institutional affiliation of the advisor or supervisor (if applicable)
7. Link to the candidate's Lattes Curriculum
8. Link to the candidate's LinkedIn profile (and Other)

Objective question about Programming Experience. Options (1 = None; 2 = Limited, 3 = Moderate, 4 = Extensive; 5 = Advanced):

None: No previous contact.

Limited: Variable assignment, Use of simple functions, Arithmetic operations.

Moderate: Writing functions, Use of loop structures, File manipulation.

Extensive: Development of some complete programs and applications.

Advanced: Proficiency in developing complete applications to solve problems.

Essay questions (Option: text response)

1. Have you had previous experience with other programming languages? (Yes or No) If the answer is positive, which languages? (Yes or No, \*if yes, specify by selecting an option - Python, R, Bash, C++, C, Java, Perl, Other)
2. Have you had previous experience with biological data analysis/manipulation? (Yes or No) If yes, what types of data? (e.g., Omics data, Epidemiological data, Biodiversity data (Fauna and Flora), Phenotypic data (Biometrics...), Georeferencing, Other). Describe briefly your experience with challenges and issues related to analyzing this data type.

Objective question about main expectation regarding the course. Options (one choice): become a programmer, develop bioinformatics tools, run bioinformatics tools, and analyze data.

Essay questions (Option: text response)

1. Justification for participation (Letter of motivation)

**\*Suggested structure for the letter of motivation:**

**I. Introduction: Briefly introduce your academic background and research project, and discuss your data and programming experience.**

**II. Motivation: Explain the purpose or the challenge involved in your current research and the problems that demand computational solutions;**

**III. Contribution: Describe how the workshop will aid in the development of your project and data analysis;**

Invitation to participate in a brief presentation during the event (Flash Talks):

*"We will allocate time during the event for brief oral presentations (15 minutes) of three chosen works. This is an opportunity to showcase your work, achievements, and challenges that still need to be solved to facilitate interactions with other professionals attending the event."*

Options: I want to participate, I do not want to participate.

**Attachment 2 – Final evaluation of the V Python Workshop for Biological Data**

*“Send us your feedback about the course you have just completed, including comments about the structure, content, and instructors.”*

Multiple choice regarding the level of effort and contribution to the course (Follow: 1 = Terrible, 2 = Weak/Poor, 3 = Satisfactory/Average, 4 = Good, 5 = Very good/Excellent).

1. Level of effort: your level of dedication to the course.
2. Contribution of the course to skill/knowledge.

Multiple choice regarding the level of learning (Follow: 1= None; 2 = Little, 3 = Fair, 4 = A lot; 5 = Advanced).

*None: Never had contact.*

*Little: Assigning variables, Using simple functions, Arithmetic operations.*

*Reasonable: Writing functions, Using structures of repetition, Data manipulation.*

*A lot: Development of some programs and complete applications.*

*Advanced: No difficulty in complete applications to solve problems*

1. Level of skill/knowledge at the beginning of the course.
2. Skill/knowledge level at the end of the course.

For Multiple choice regarding the instructors' ability and receptivity (Follow: 1 = Totally disagree, 2 = Partially disagree, 3 = I don't know how to answer, 4 = Partially agree, 5 = Completely agree).

1. The instructors were efficient.
2. The presentations were clear and organized.
3. Instructors stimulated student interest.
4. The instructors used their time well during classes.
5. The instructors were accessible and helpful.

For Multiple choice regarding the instructors' ability and receptivity (Follow: 1 = Totally disagree, 2 = Partially disagree, 3 = I don't know how to answer, 4 = Partially agree, 5 = Completely agree).

1. The objectives were clear
2. Course content was organized and well planned
3. Course load was appropriate
4. The course was organized to allow all students to participate
5. The teaching material was well designed
6. The tools were adequate to carry out the course

Multiple choice and discursive essays about the course (Alternatives or long answer text)

1. What aspects of this course were most useful or valuable to you? Explain.
2. Did the Workshop spark your interest in delving deeper into the Python programming language? (Options: Yes, No)
3. Was the content presented in the Workshop useful for your research? (Options: Yes, No)
4. How can the content presented during the event be applied to your research? Explain.
5. (Optional) How would you improve this course? Is there anything you would like to include?
6. What was the experience of participating in the remote learning course? (Options: 1 = Terrible, 2 = Weak /Poor, 3 = Satisfactory/Average, 4 = Good, 5 = Very good /Excellent)
7. Would you take another course in the same format? (Options: Yes, No)
8. (Optional) Do you have any other comments, criticisms or suggestions about the course?
9. (Optional) Would you like to write a personal story? Please use this space.

**Attachment 3 – Daily Feedback (Form applied at the end of each day of the course).**

*"The purpose of this form is for you to help us improve the course. Please inform us if something is unclear so we can plan a small review in the following lecture. In addition, participation in the Workshop will be recorded based on the daily feedback forms."*

**Objective and general questions about the course** (1 = Strongly disagree, 2 = Partially disagree, 3 = Don't know how to answer, 4 = Partially agree, 5 = Strongly agree)

1. **(Objective)** Today's lecture increased your perception of the application of programming in analyses involving biological data.
2. **(Objective)** The Workshop member well taught the content presented today.
3. **(Objective)** The content presented today was easily understood by the workshop participants (students).

**Open-ended and general questions about the course (Open answers)**

1. **(Open-ended question)** Are there topics that need to be revised? (Yes or No) Which ones? (If yes, please mention to which topic the subject belongs, for example, a particular type of variable, a specific library, figures and graphs, etc.)
2. **(Open-ended question)** What criticisms and suggestions from today can enhance the workshop in the future?
3. **(Open-ended question)** How can the topics discussed today be applied to your research project?

**Specific questions about the course** (related to daily contents)

**Day 1 (Python Introduction)**

1. **(Objective)** I understood well the concept of variables, types of variables, and their manipulation.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** I understood well the usage and use cases for conditional statements (if, elif, and else).

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** I understood well the concept of sequences, lists, and their manipulations.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** The inclusion of possible errors that can be generated in each topic helped me learn how to deal with language error messages, and I will feel confident when encountering messages of this type in the future.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** Did the use of animations and exercises answered together with the professor help/facilitate the understanding of the topics covered? Please express your opinion.
2. **(Open-ended)** Which part of the explanation during the day caused the most difficulty?

**Day 2 (Pandas, Numpy, and Matplotlib)**

1. **(Objective)** The content of Pandas presented is or will be useful for your research.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** I understood well the use of Pandas library functions for the manipulation and preparation of biological tabular data for practical analysis.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** The content of Numpy presented is or will be useful for your research.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** The content of Matplotlib presented is or will be useful for your research.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If your answer to the previous question was affirmative, which Matplotlib library functions will be explored in your work?
2. **(Open-ended)** What other types of graphics would you like to have been presented?
3. **(Objective)** I understood well the application of Matplotlib for creating scientific graphics and for visualization of biological data analysis.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** I can transfer the concepts and adapt the codes I learned in the workshop so far to the context of my scientific research.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If your answer to the above question was different from 4/5, briefly describe which concepts were unclear or were not addressed and that limit you from applying the knowledge acquired from this day to the context of your scientific research.

**Day 3 (Individual and Group Exercises)**

1. **(Objective)** I feel confident in solving individual exercises in Python.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that cause insecurity in solving individual exercises.
2. **(Objective)** The time provided for solving individual exercises was adequate.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that prevented you from solving individual exercises within the provided time.
2. **(Objective)** I feel confident in solving group exercises in Python.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that cause insecurity in solving group exercises.
2. **(Objective)** The resolution of group exercises was done uniformly and homogeneously by all members of my group.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that prevented the resolution of group exercises from being uniform and homogeneous among all members of your group.

**Day 4 (Pandas and Seaborn)**

1. **(Objective)** I feel confident in exploring unknown datasets in Python.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that make you feel insecure about exploring unknown datasets.
2. **(Objective)** I find it easy to plot graphs with the data from a dataset.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** I find it easy to calculate basic statistics from a dataset.

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Open-ended)** If applicable to your case, briefly describe the factors that make it difficult to find suitable graphs and statistics to answer your questions.

**Day 5 (Datasets and Biopython)**

1. **(Objective)** Did you understand well the use of functions presented from the Biopython library?

*1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree*

1. **(Objective)** Were you familiar with the Biopython library?

1 = Yes, 2 = No

1. **(Objective)** How do you consider the use of Biopython and its functions for manipulating biological data?

1 = Useless, 2 = Little useful, 3 = Don't know how to answer, 4 = Useful, 5 = Very useful

1. **(Objective)** Can you transfer the concepts and adapt the codes you learned to the context of your scientific research?

1 = Strongly Disagree, 2 = Partially Disagree, 3 = Don't know how to answer, 4 = Partially Agree, 5 = Strongly Agree

1. **(Open-ended)** Did you have any doubts related to the use of the library? Which ones?