CoGrammar

DS PORTFOLIO SESSION 1

SKILLS FOR LIFE
SKILLS BOOTCAMPS

Department for Education

Data Science Lecture Housekeeping

- The use of disrespectful language is prohibited in the questions. This is a supportive, learning environment for all – please engage accordingly. **(FBV: Mutual Respect.)**
- No question is daft or silly – **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Open Classes. You can submit these questions here: **Open Class Questions**

Data Science Lecture Housekeeping cont.

- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**
- Report a **safeguarding** incident: **www.hyperiondev.com/safeguardreporting**
- We would love your **feedback** on lectures: **Feedback on Lectures**

Reminders!

Upcoming deadlines, GLH requirements, etc.

Guided Learning Hours

By now, ideally you should have 7 GLHs per week accrued. Remember to attend any and all sessions for support, and to ensure you reach 112 GLHs by the close of your Skills Bootcamp.

Progression Criteria

✅ Criterion 1: Initial Requirements

- Complete 15 hours of Guided Learning Hours and the first four tasks within two weeks.

✅ Criterion 2: Mid-Course Progress

- Software Engineering: Finish 14 tasks by week 8.
- Data Science: Finish 13 tasks by week 8.

✅ Criterion 3: Post-Course Progress

- Complete all mandatory tasks by 24th March 2024.
- Record an Invitation to Interview within 4 weeks of course completion, or by 30th March 2024.
- Achieve 112 GLH by 24th March 2024.

✅ Criterion 4: Employability

- Record a Final Job Outcome within 12 weeks of graduation, or by 23rd September 2024.

How do you define a variable in Python?

A. x = 1
B. int x = 1
C. x == 1
D. x: 1

Which of the following options is NOT a logical operator?

A. >
B. <=
C. =
D. =!

What is the type of the following value: True

A. String
B. Long
C. Condition
D. Boolean

Recap of Week 1: Beginning Programming

Input and Output

- Using input() to get input from the user
- Using print() to display output to the user

Variables

- Naming and defining variables
- Accessing and changing variables

Types

- Identifying types in Python
- Converting values from one type to another

String Manipulation

- Manipulating strings using slicing and indexing
- Using string functions and operations

Recap of Week 1: Beginning Programming

Control Structures

- Using If, Else and Elif statements for flow control
- Boolean values and their role in conditional statements

Operators

- Using comparison operators to compare values and logical operators to combine conditional statements
- Understanding assignment and arithmetic operators

While Loops

- Create and use while loops in Python
- Using break and continue statements

Personalised Chatbot (UniBuddy)

- **Background:** Imagine the first day of university for a freshman named Alex. Alex is excited but also overwhelmed by the vast campus, numerous courses, and the sea of new faces.

- **Challenge:** You are tasked with developing a personalised chatbot. This chatbot, named "UniBuddy", is designed to make the transition smoother for freshmen.

- **Objective:** Develop a program to:
  - Collect personal information from new students like their name, favourite colour and age.
  - Give personalised responses based on the entered information.
  - Answer predetermined questions from users.

Code Toolbox

- **Managing User Inputs**

```
# Getting and storing user input
name = input("What is your name? ")
country = input("Where are you from? ")
```

- **Formatting Output Strings**

```
# Use stored input to create personalised responses
print("Hello {}!".format(name))
print("You're from {}, that's a great place.".format(country))
```

Code Toolbox

- **Control Structures and While Loops**

```
done = False
my_num = 24
while (not done):
    guess = input("Try and guess my number: ")

    if (guess == my_num):
        print("You've guessed my number! Well Done!")
        done = True
    else:
        print("That's wrong try again.")
```

Demo: Example Output

```
Hi! My name is UniBuddy and I am here to help you through your university journey :)
I'm going to ask you a few  questions so I can get to know you a little better.

What's your name? Alex
Hi Alex!

How old are you? 17
Wow! You're starting university at a young age! You must be really talented.

What faculty do you belong to? Science
The Science faculty is really great. How exciting!
What are your majors? Computer Science and Math
Ah, Computer Science and Math. A friend of mine studied that.

I think those are all the questions I needed to ask...
Oh wait! I have one more.

What's your favourite colour? Green
I like Green, but my favourite colour is Blue, like our soccer team's colours.

Thank you for telling me more about yourself! It's so lovely to meet you Alex.
The Science faculty is lucky to have you!
You can ask me whatever questions you need answers to and I'll do my best to answer them.
When you're done asking questions, you can just say "Bye".

Do you have a question to ask me?
Who is my student mentor?
You can find out who your student mentor is by reporting to Room 100 in the Pink building further down this road.

Do you have a question to ask me?
bye
Thank you for chatting with me! I hope the rest of your uni journey goes well!
```

Demo: Storing Questions and Answers

Using variables

```
# Store questions in variables
question1 = "where is the fees office"
question2 = "who can help me with my curriculum form"
question4 = "which courses should i take"
question5 = "who is my student mentor"

# Store answers in variables
answer1 = "The fees office is located in the Blue building on Camp Lane.",
answer2 = "You can speak to your course advisor or an Orientation Leader."
answer4 = "You can talk to an Orientation Leader or your course advisor."
answer5 = "You can find out who your student mentor is by reporting to Room 100."
```

Using lists

```
# Store questions in variables
questions = [
"where is the fees office",
"who can help me with my curriculum form",
"where can i find out more about student accommodation",
"what clubs does the university offer",
"which courses should i take",
"who is my student mentor"
]

# Store answers in variables
answers = [
"The fees office is located in the Blue building on Camp Lane.",
"You can speak to your course advisor or an Orientation Leader.",
"The SRC can help you with that.",
"The university offers a wide range of clubs.",
"You can talk to an Orientation Leader or your course advisor.",
"You can find out who your student mentor is by reporting to Room 100."
]
```

Demo: Using Conditionals for Personalised Responses

```
# You can use conditionals to allow for personalised and contextual responses
# Remember to typecast correctly where necessary
age = int(input("How old are you? "))
if age < 18:
    print("Wow! You're starting university at a young age! You must be really talented.")
elif age > 25 and age < 35:
    print("Hmm, you're much older than I expected.")
elif age > 35:
    print("That's fantastic! It's never too late to learn and grow.")
else:
    print("{} is a fun age to start university at! I started when I was 18 years old :P".format(age))
```

Demo: Using While Loops for Continuous Engagement

```
# Continuously prompt the user for questions
done = False
while not done:
    question = input("\nDo you have a question to ask me?\n")

    question = question.strip("?")
    question = question.strip()
    question = question.lower()

    # If the question is known, find the right answer.
    # If not, check if the entered input was bye.
    # If not, say that the input was not recognised.
    if (question in questions):
        question_num = questions.index(question)
        print(answers[question_num])
    elif (question == "bye"):
        done = True
        print("Thank you for chatting with me! I hope the rest of your uni journey goes well!")
    else:
        print("I don't understand your response. Please try again.")
```

UniBuddy: Your University ChatBot

Create a ChatBot to help new students navigate university. The ChatBot should offer personalised responses and should answer some commonly asked questions.

Some examples of questions the ChatBot could answer:

1. Who can help me with my curriculum form?
2. Where can I find out more about student accommodation?
3. What clubs does the university offer?

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Step-by-Step Tasks

1. **Personalised responses:** Decide on what personalised responses the program will offer and what information will be needed from the user.
2. **Question formulation:** Decide which questions your program will be able to answer and their answers.
3. **Continuous engagement:** Implement a way for users to have a continuous conversation with the bot.

Advanced Challenge

- Try adding in functionality to your program that will offer users personalised suggestions, based on information they've provided and questions they've asked.

Tips

- To avoid cluttered code, store the predetermined questions in variables at the beginning of your program.
- Decision Trees are a very helpful tool to plan out your code.

Summary

Develop a ChatBot

- ★ Collect personal information from new students like their name, favourite colour, and age.
- ★ Offer personalised suggestions based on the entered information.
- ★ Answer predetermined questions from users.

Tips for solving problems

- ★ Use input and output functions to prompt users for their information.
- ★ Store user information in variables to create personalised responses.
- ★ Use conditional loops to check for pre-programmed questions.
- ★ Use while loops to allow the Bot to continuously engage with the user until they have satisfied an exit condition.

Which of the following functions would you use to remove trailing and leading whitespace from a String?

A. remove(“ ”)
B. replace(“ ”, “”)
C. split()
D. strip()

What is one of the purposes of a while loop?

A. To execute a block of code a specific number of times.
B. To create an infinite loop that runs continuously.
C. To iterate over elements in a list or array.
D. To repeatedly execute a block of code as long as a specified condition is true.

Questions and Answers

Questions around the Case Study