ANL252

Python for Data analytics

Tutor-Marked Assignment

July 2023

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SUSS PI Number: B2010698

Name: Ong Chiew Ling

Submission Date: 15 September 2023

Answer to Question 1

a) As technology advances, generative AI is developed, ChatGpt was released in November 2022 that is capable to generate human-like language given a context in seconds and for free. It has received record-breaking welcome, it’s users grow parabolically – surpassed 1 million in 5 days and over 100 million by Jan 2023 (Duarte, 2023).

However, it raises concerns on plagiarism that undermines academic integrity.

Why plagiarism happens:

1. Knowledge and skills take time and effort to acquire, through repetitive practice, trial, and error, making us feel defeated at some point in time. When there is a less-resistant path to access to comprehensive and relevant information readily, there is no need to go through the hard work to learn them.
2. Falling behind academic expectation while facing pressure of meeting multiple assignments deadlines – conveniently.
3. Oversight or negligent – omitting proper citation to credit source.
4. Outright cheating

How to avoid the issue:

1. Pursue course of study according to passion and strength– willing and able
2. Discover joy and drive to master principles and skills
3. Plan and manage schedules effectively
4. Affirm and reward progress or achievements
5. Seek help when needed
6. Attribute and credit external sources

b) Create a simple retirement calculator using python (ChatGpt):

# This is a retirement calculator

def retirement\_calculator(current savings, annual\_contributions, annual\_interest\_rate, retirement goal):

year = 0

while current\_savings < retirement\_goal:

current\_savings += annual\_contributions

current\_savings \*= (1 + annual\_interest\_rate / 100)

years += 1

return years

if \_name\_ == “\_\_main\_\_”:

current\_savings = float(input(f“Enter your current retirement savings: $ ” ))

annual\_contributions = float(input(“Enter your annual contributions: $” ))

annual\_interest\_rate = float(input(“Enter your assumed interest rate (as a percentage): ” ))

retirement\_goal = float(input(“Enter your retirement savings goal: $” ))

years\_to\_retire = retirement\_calculator(current\_savings, annual\_contributions, annual\_interest\_rate, retirement\_goal

print (f “\n It will take you approximately (years\_to\_retire) years to reach your retirement saving goals.”))

This piece of code helps people to find out how long does it take for them to work and save before they can retire using the formula of time value of money, based on users’ input according to their current financial situation or present value to project the future value and the duration it takes. By varying the inputs such as annual contributions, assumed annual interest rate or rate of return, user could get a different output, instantaneously.

To illustrate:

#1 An user wants to know when can she retire:

Enter your current retirement savings: $100000

Enter your annual contributions: $10000

Enter your assumed annual interest rate (as a percentage): 5.0

Enter your retirement savings goal: $500000

It will take you approximately 17 years to reach your retirement savings goals.

#2 should she feels that 17 years is still too long, she could either double the annual contribution or increase the rate of return to 8% which bring outcome to 12-13 years.

Planning and saving for retirement is a long term process, knowing what it takes early would definitely help us to start the preparation sooner rather than later and approach the subject as well as life more confidently.

c) Modifying the regeneration from ChatGpt

# This is a monthly retirement income calculator

def retirement\_calculator(current savings, annual\_contributions, annual\_return, years\_to\_retirement):

future\_value = current\_savings

total\_contributions = 0

for year is range (1, years\_to\_retirement +1):

future\_value += annual\_contributions

interest\_earned = future\_value \*= (1+annual\_return/100)

future\_value += interest\_earned

total\_contributions += annual\_contributions

print(f“ Year {year}:”)

print(f“ Contributions: $ {annual\_contributions:,.2f}”)

print(f“ Interest Earned: ${interest\_earned:,.2f}”)

print(f“ Total Savings: ${future\_value:,.2f}”)

print()

return future\_value, total\_contributions

if \_name\_ == “\_\_main\_\_”:

current\_savings = float(input(f“Enter your current retirement savings: $ ” ))

annual\_contributions = float(input(“Enter your annual contributions: $” ))

annual\_return = float(input(“Enter your expected annual return on investments (as a percentage): ” ))

years\_to\_retirement= int(input(“Enter the number of years to retirement: ” ))

print(f “\nTotal Contributions: ${total\_contributions:,.2f}”)

print(f“Estimated Retirement Savings: ${future\_value:,.2f}”)

print(f“The estimated monthly retirement income is :${round(future\_value/300)} for 25 years)

A close-up of a text

Description automatically generated

Rationale behind modification/rewriting code:

1. The best approach is certainly to rewrite the code starting from scratch. I am not confident that I can do that, hence I modify the code by varying the subject, instead of calculting the number of years, I calculate the future value.
2. It will be encouraging to see Total Saving grows over the years, hence, they are listed out.
3. There are a lot of debate on how much is enough for retirement. It is not a straight forward question to answer. We see that every few years, the retirement age is raised. In 2016, only 53% of active CPF members age 55 in Singapore meet their full retirement sum requirement (MOM, 2018). So we know, majority of the people do not have enough resources for retirement. Hence, it is imperative to start planning and saving early so the journey of wealth accumulation is less steep. To do that, we need to help people to visualise the numbers.
4. While ChatGpt has high computing power and can generate information must faster, it does not know what is which information is most relevant or the biggest concern of most people unless it is input as an instruction. After working with many clients, client centric servicing agents would know what to share to address their concern, even without them mentioning it. Knowing how much to save in what timeframe is only the first half of the equation – the accumulation phase. It is incomplete. The second half of the equation is the distribution phase – how does this sum of money benefit them specifically? Therefore, it is important to show the estimated monthly retirement income and how long would that last them, based on the general rule of thumb of 4% drawdown, conservatively assuming no return on investment.

Answer to Question 2

products =[‘laptop’, ‘mouse’, ‘webcam’, ‘keyboard’, ‘speaker’]

print(f “We have a listof products here: {products}.”)

item = str(input(f“Hello! What do you want to buy?”)

if item not in products:

print(f “Wrong product! Please try again.”)

else:

price\_of\_items = int(input( “How much is it (in SGD)?))

print(f “Thank you for shopping with us!)

To enhance reliability, readability, maintainability, and overall quality, we shall:

1. Keep coding simple and neat, break section into modular and avoid long functions
2. Use descriptive and meaningful variable name that is easy to relate as well as add comment to indicate the objectives
3. Test run vigorously to optimize where necessary

References:

Duarte F. (July 13, 2023). *Number of ChatGPT Users (2023)*. Retrieved on 13 September 2023 from Exploding Topics https://explodingtopics.com/blog/chatgpt-users

Ministry of Manpower (July 10, 2018). *Written Answer by Mrs Josephine Teo, Ministry of Manpower, to Parliament Question on CPF Withdrawal at age 55*. Retrieved on 15 September 2023 from MOM website https://www.mom.gov.sg/newsroom/parliament-questions-and-replies/2018/0710-written-answer-by-mrs-josephine-teo-minister-for-manpower-to-parliamentary-question-on-cpf-withdrawals-at-age-55

Wu, K. Y., & Zhu, S. (2023). *ANL252 Python for data analytics*. Singapore University of Social Sciences.