Machine
Learning

UNIVERSITY CANADA WEST

MACHINE MARKET

University Canada West (UCW)
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BUSI 651 Machine Learning Tools and Techniques

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Vancouver House: Room: E-405: On Campus

Professor Sarah Gholibeigian

Due before 11:59 PM (PT) on
Sunday, July 28th, 2024..

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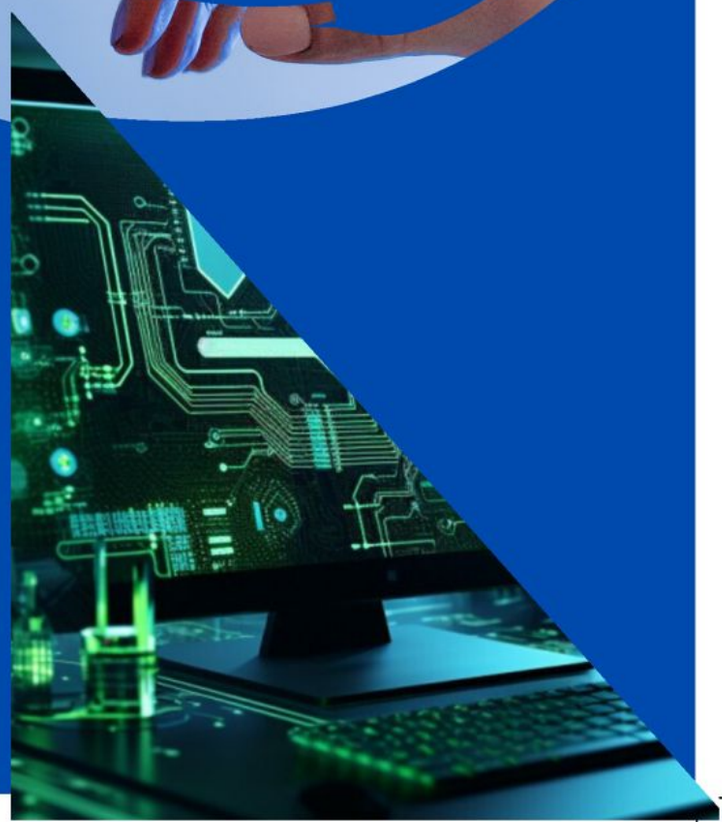
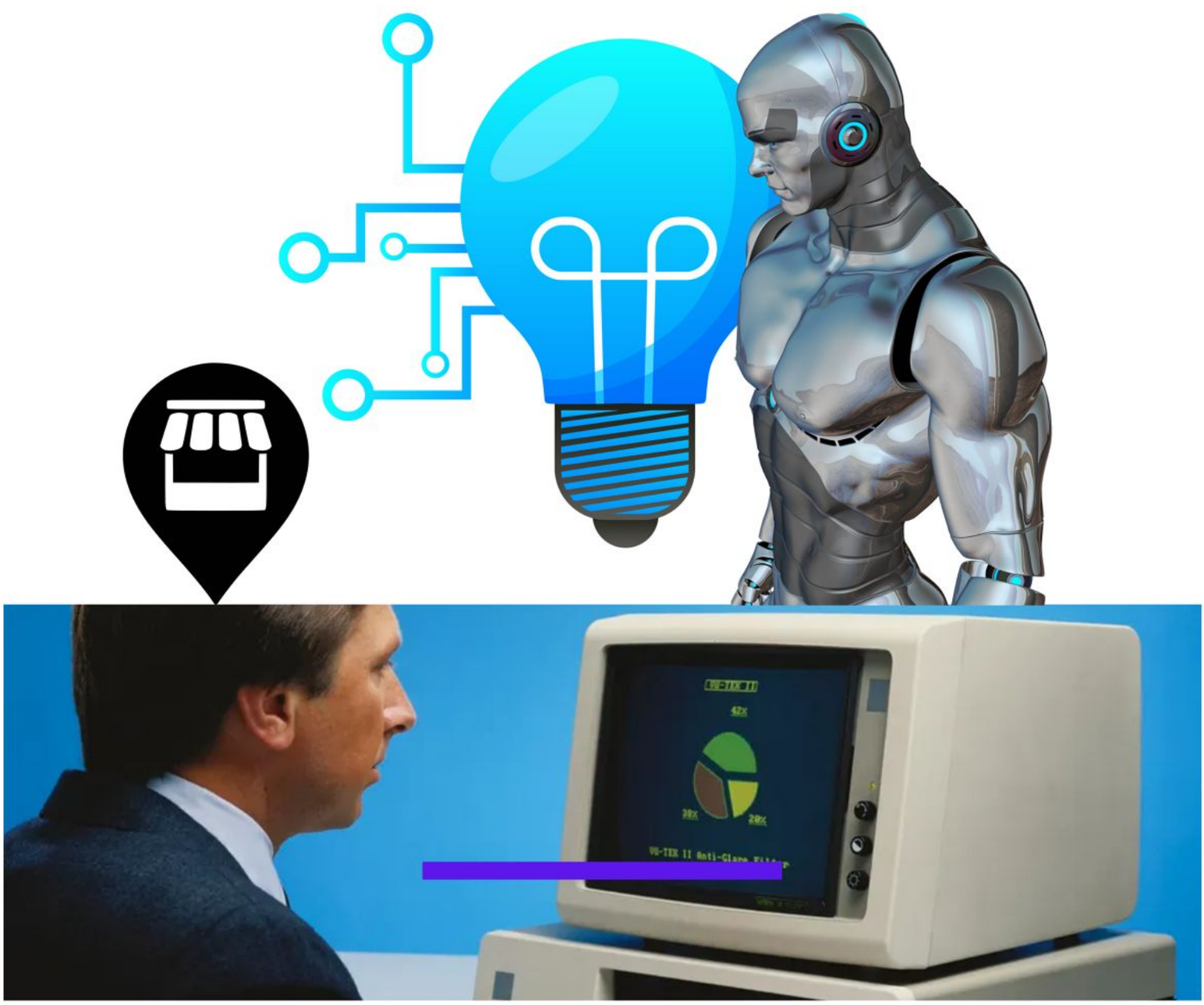


Executive Summary

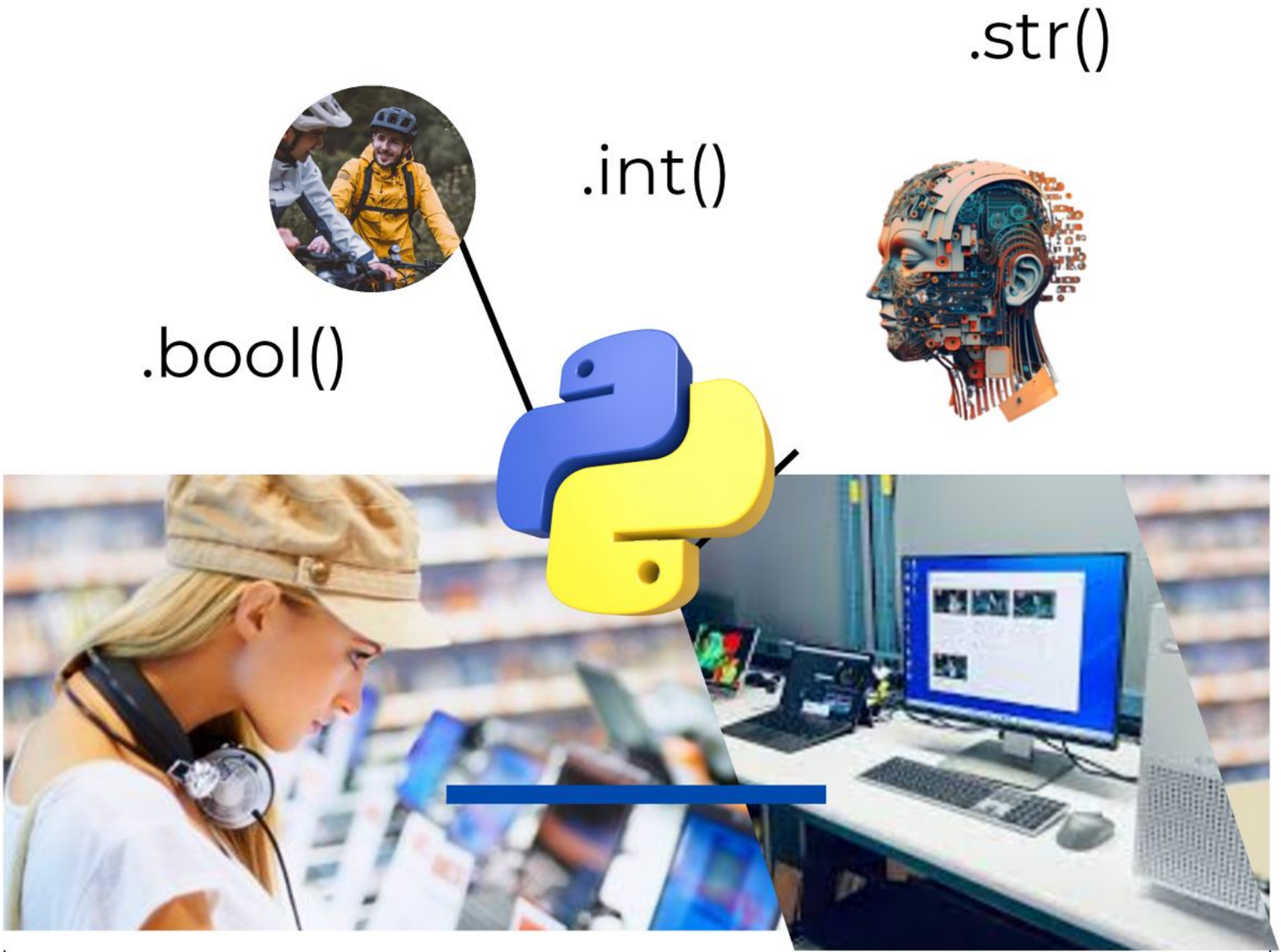
In the following report has been carefully stated how Machine Learning (ML) delves into a technological sector of a circumstantial change for the human kind in its options for the searching upon better answers seeking a brighter future from the process of learning a simple command to indicate the systems on how to solve an issue or giving the proper guidance through snippets for the computers to replicate ideas and continue the process of automatization into the writing of a code and the help of languages such as Perl, R, Ruby, SQL or even Python for the consulting of datasets or just for a simple computing of operations delivering the dissection of any complex situations and the content which will be taken into descriptive, predictive and prescriptive analysis for the idealization of a business model or a planning for the campaign management taken into consideration the scientifical method and the discoveries of the example shown inside of the project with a "Decathlon in Burnaby, British Columbia (BC) in Canada" with a Python amazing solution.



Introduction

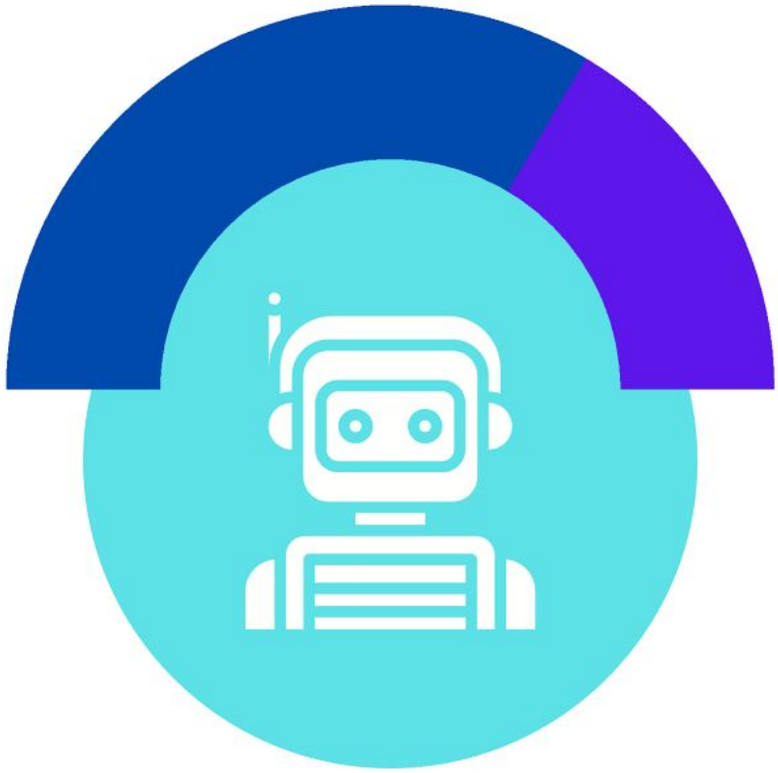
Assessing business trends and patterns is an essential part in Business Analytics (BA) and Machine Learning (ML) conducts research and involvement into the supporting corporate solutions coming out of the insights generated from Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL) and the concept of optimizing algorithms whether there is coding or just the point of view of visualizations. However, this is not the only narrative behind the business environment must recognize the need for the complex bonding within a solution for the addressing of any conflict with a specific guidance from data. Thus, any company must rely on Data Science (DS) and the growth for revenues, sales, business operations and the opportunities for any business model.

The model presented of a fiction scenario with a store from Decathlon and the sports industry conveys into a market sales chance for analysis of variables, engineering prompts through the usage of Python Notebook's (.ipynb). Furthermore, many industries take the implementation of technologies for the better determination of any procedures and operative insights showcasing the further visualization of any information and a helpful innovation for the considerations of any future predictions among the organization of a business (Decathlon, 2024).



Background Analysis

The industrial qualifications for the business model generation in the Python engines and languages such as the usage for the retail market and the sales management operations is part of the new crowded solutions which are currently studied by Information's Technology (IT) and the intermission of many developers for the performance of a business and corporate identification through the programming of datasets for the proper studies of high quality data and the "Data Pipeline" or the identification of new outcomes regarding the stages of converting data into a rare but useful basis for the transformation of the sales and sports market for fanatics, practitioners of exercises for aesthetics, health or just for relaxation to transport their desires of positivity into a helpful business with all the needed customer's behaviors and knowledge of their request through good story telling (Dunlea, J., 2024).



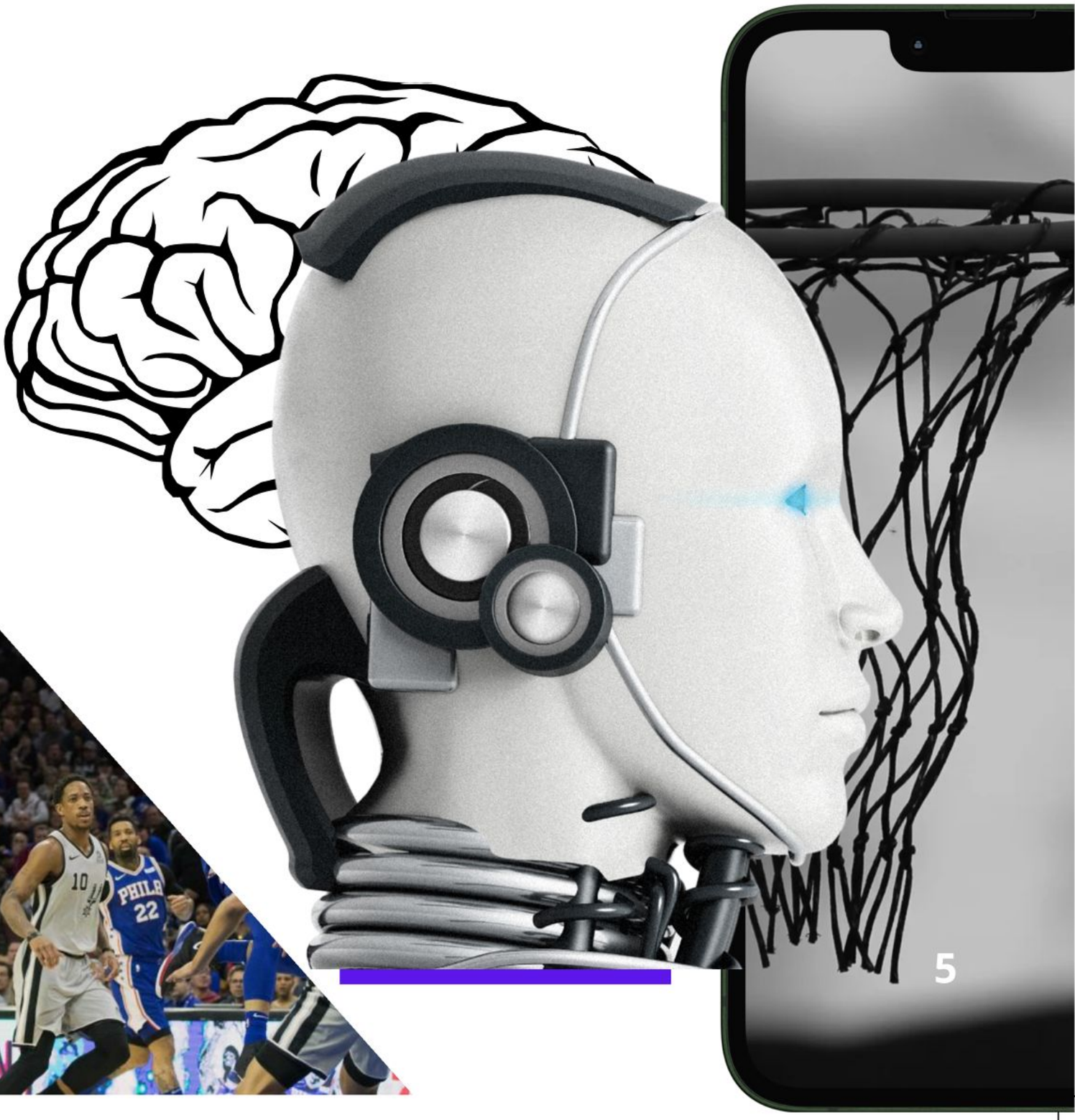
Vancouver by City of Vancouver

Relevance
of the Industry

Many of the movements done in monetary terms everyday are thanks to the constant market's growth in the retail-in-store purchases where many interest comes from the development of any task and needs with the usage of tools such as digital equipment and Cloud Computing (CC) solutions giving an in-bound resolution towards any continuous process of research for the idealization of any conversations going to any client's recommendations from a predictive, descriptive and prescriptive conceptualization. Thus, the retail stores are involved heavily inside of the Data Analytics (DA) process and the place of this science for the delivery of possible keys with arguments for any inquiries and tasks from an advancement.

Purpose of the Investigation (POTI)

The main purpose of the investigation is to have a real experience with the conviction of not perfectly knowing the operability behind the the language, Python. Nevertheless, the usage of the language as the help of a proper detailing into what may happen out of an specific situations and how to be prepared for any possible tasks in the future while bringing not only technical skills to the stage but also establishing a linking point with a creative side inside of every Data Analyst (DA) for the good of the story telling as mentioned before (Microsoft, 2024).



Objectives

- Describe the changes in the usage of various lessons and applications for Python as a language for Data Analytics (DA) and Business Analytics (BA).

- Develop insights about the usage of Python notebooks for the analytics of information delivering sources of solutions.

- Conduct analysis tools usage for key measurements when maintaining positive management and considerations.

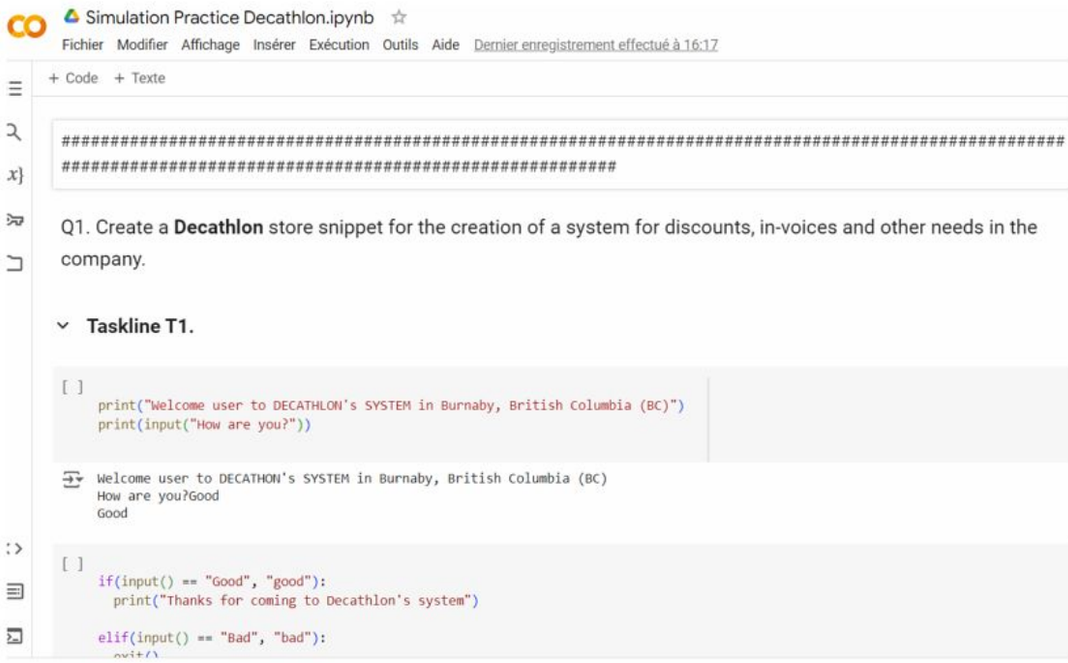
Scope

Benefits of working with these languages and desire to learn new ways to process high data calibers seen on a dataset as it conveys into a vast opportunity of improvement due to the process of keeping up businesses with differential technologies delivering the conflict solving solutions based on data driven decisions.

Results and Investigation

Python as a Language:

Key measurements such as variables to give unique forms of address to an instruction while keeping logical statements with the usage of commands such as “Print”, “Variable Definition”, “Limiting Variables (LV)”, “ Type (Indicator of Type of Variable (String(Str.), Boolean (Bool.), Integer (Int.)(+-), For, If, Elif, Else, Or, among many other sub-processes for the ideal measuring of a proper software program generated in Python language).



Snippet with “Simulation of Store in Python for Decathlon Burnaby, Canada”.

Results and Investigation

Simulation:

The programming language allows Data Analysts (DA) the option to decide which subsets to choose based on different modes of cleaning, preparing and analyzing data. Nevertheless, for a start it is necessary to import any data from an external folder to a Python Notebook into Google Collaboratory or the selected API used for the data projections or program done.

```
1]  from google.colab import drive
    drive.mount('/content/drive/')

    Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=947318989803-6bn6

    Enter your authorization code:
    ··········
    Mounted at /content/drive/
```

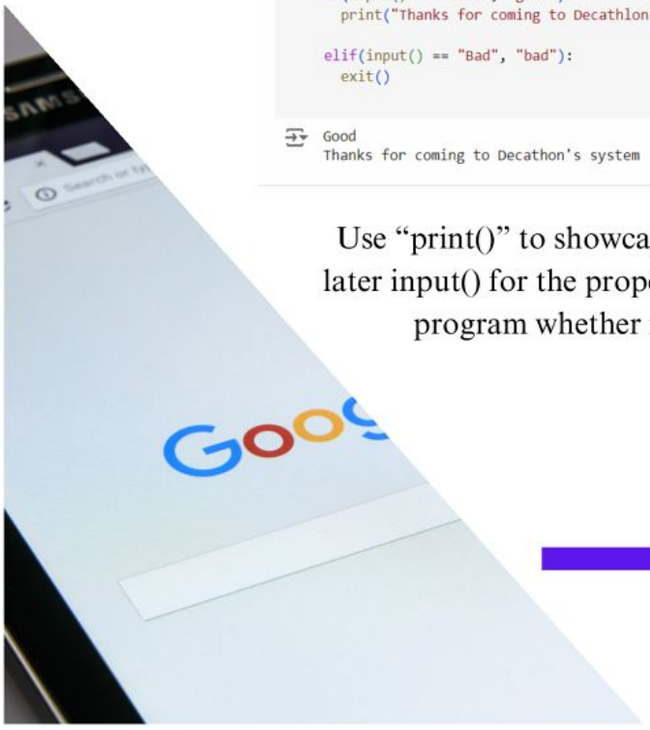
import from Google Drive (Folder) to Collab with a mounting of data and confirmation of retrieval

Q1. Create a **Decathlon** store snippet for the creation of a system for discounts, in-voices and other needs company.

Taskline T1.

```
[ ]
    print("Welcome user to DECATHLON's SYSTEM in Burnaby, British Columbia (BC)")
    print(input("How are you?"))

    Welcome user to DECATHON's SYSTEM in Burnaby, British Columbia (BC)
    How are you?Good
    Good

[ ]
    if(input() == "Good", "good"):
      print("Thanks for coming to Decathlon's system")

    elif(input() == "Bad", "bad"):
      exit()

    Good
    Thanks for coming to Decathon's system
```

Use “print()” to showcase any strings or text into the program and later input() for the proper input of any orders, strings or data into a program whether it is manually or through a database.



Results and Investigation

The concept of “Slicing” helps us Data Analyst’s tracking of data into a robust but easier procedure dividing any .find values with the usage of [:} or a starting point or end point.

From [5:10] means from the fifth slot to the tenth slot excluding the last slot and the first one, two, three, four and the zero slot values in a word or dataset inside an array or group of numbers.

```
email_1.find('m')
```

```
2
```

```
[ ] my_email[3:]
```

```
'@gkjg'
```

```
[ ] email_4[4:]
```

```
'@ak.com'
```

```
[ ] my_email[:-8]
```

```
'jairom@g'
```

Results and Investigation

Simulation Practice Decathlon.ipynb ☆

Fichier Modifier Affichage Insérer Exécution Outils Aide Dernier enregistrement effectué à 16:17

+ Code + Texte

Taskline T2. Insert the Product to be purchased by today's customers.

```
[ ] list_of_products = list()
    for i in range (0,5):
        list_of_products.append(input("Please, enter the product's name into Decathlon's Database (DDB)"))
    print(list_of_products)

    print("Thanks")
```

```
Please, enter the product's name into Decathon's Database (DDB)Socks
Please, enter the product's name into Decathon's Database (DDB)Socks
Please, enter the product's name into Decathon's Database (DDB)Socks
Please, enter the product's name into Decathon's Database (DDB)Tee
Please, enter the product's name into Decathon's Database (DDB)Pants
['Socks', 'Socks', 'Socks', 'Tee', 'Pants']
Thanks
```

```
[ ] print("Enter the product name: ")
    product = input()
    list_of_products.append(product)
    print(list_of_products)
```

```
Enter the product name:
Socks
['Socks', 'Socks', 'Socks', 'Tee', 'Pants', 'Socks', 'Avion', 'Tee', 'Socks']
```

The list or "Listing" process is a manner of compressing data and giving a referential value to a specific group of articles, data, products or any category with the input manually or based on a dataset for the growth of possibilities in manipulation of an enlarged scalar dataset for the transformation of itself into rich and valuable insights.

Results and Investigation

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Taskline T4.

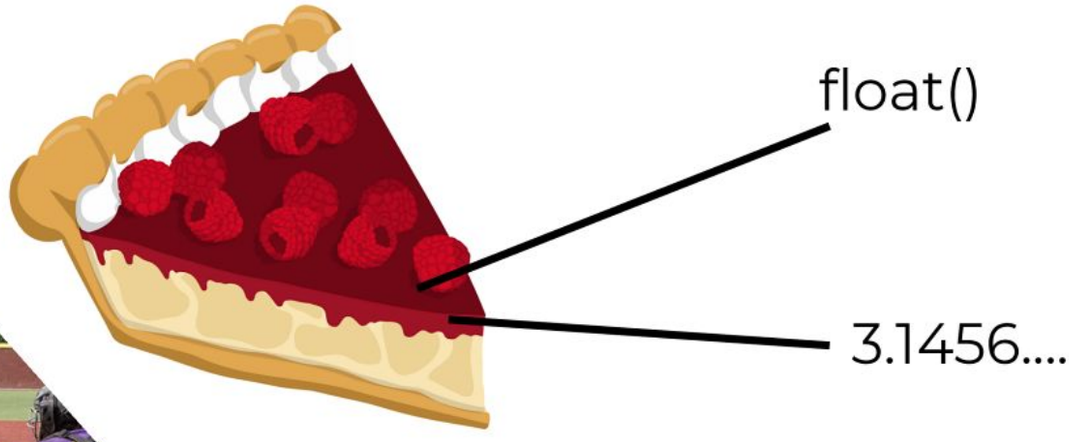
```
[ ]  'Pants'=='40.99'
     print("The type of 'Pants' is:") , type('Pants')
```

```
The type of 'Pants' is:
(None, str)
```

```
[ ]  price_of_pants = 40.99
     type(price_of_pants)
     print("The type of the Price of Pant's due to the error presented before is:"), type(price_of_pants)
```

```
The type of the Price of Pant's due to the error presented before is:
(None, float)
```

The process of matching variables with available connotations is also import as an Data Analyst (DA) as you must use int() for any numerical values or float() which means a number "Floats" between two numbers as a decimal such as the PI number or 3.1456 in mathematics. On the other hand, "type()" allows us to describe or recognize the type of data being analyzed as something Python does eventually is to interpret data as various types of data mentioned in the introduction of the report.



Results and Investigation

Q5. How many of each articles are you taking today?</b?

Taskline 5 T5.

```
[ ] print("Insert which product you are taking and the amounts please")

    # Use a dictionary to store product prices
    product_prices = {
        "Socks": 1.50,
        "Tee": 24.99,
        "Pants": 40.99,
        "Toques": 16.29,
        "Hats": 19.99,
        "Trainers": 29.99
    }

    product_1 = input()
    amount_1 = int(input()) # Convert amount to an integer

    if product_1 in product_prices:
      total_cost = product_prices[product_1] * amount_1 # Calculate total cost
      print("Total cost: ", total_cost)
    else:
      print("not available")
```

Assignation of variables is a crucial activity for the determination of proper values to a unique instruction for the Machine Learning (ML) procedures to become organic inside of a program or dataset analysis.

```
product_1 = input()
amount_1 = int(input()) # Convert amount to an integer

if product_1 in product_prices:
  total_cost = product_prices[product_1] * amount_1 # Calculate total cost
  print("Total cost: ", total_cost)
else:
  print("not available")

product_2 = input()
amount_2 = int(input()) # Convert amount to an integer

if product_2 in product_prices:
  total_cost = product_prices[product_2] * amount_2 # Calculate total cost
  print("Total cost: ", total_cost)
else:
  print("not available")

product_3 = input()
amount_3 = int(input()) # Convert amount to an integer

if product_3 in product_prices:
  total_cost = product_prices[product_3] * amount_3 # Calculate total cost
  print("Total cost: ", total_cost)
else:
```

Results and Investigation

Conditionals are also a huge part of giving the stablishing of limits for the Machine Learning (ML) to become effective as the variables are handed inside of delimitated area or logic for a follow-up of information. Stating if an external value inside the restrictions is present the outcome should definitely showcase an error.

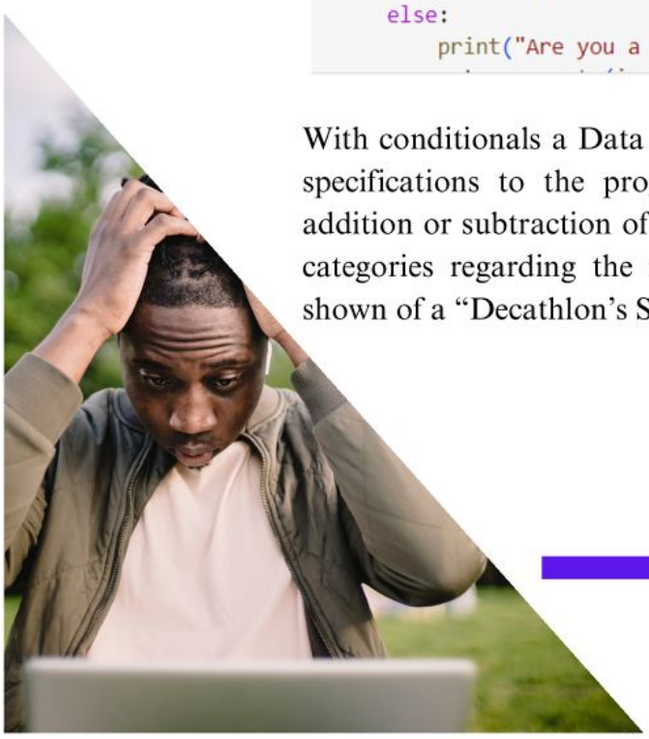
```
    else:
      print("not available")
```

```
Insert which product you are taking and the amounts please
Socks
1
Total cost:  1.5
Socks
1
Total cost:  1.5
Socks
3
Total cost:  4.5
```

Q6. Are you a retired veteran or over the age of 65 years old?

Taskline 6 T6.

```
[ ] print("Print your age please")
    age = int(input())
    if age >= 65:
        print("Yes there is a discount for you")
    else:
        print("Are you a veteran?")
```



With conditionals a Data Analyst (DA) has the power to include new specifications to the program or dataset's accounting such as the addition or subtraction of any limits, discounts, any categories or sub-categories regarding the needs for creating invoices in the example shown of a "Decathlon's Store at Burnaby, BC in Canada".

Results and Investigation

```
print("Print your age please")
age = int(input())
if age >= 65:
    print("Yes there is a discount for you")
else:
    print("Are you a veteran?")
    veteran = str(input()) # Remove extra indentation here
    if veteran == "Yes":
        print("Yes there is a discount for you")
    else:
        # pass  # Remove or comment out unnecessary 'pass'
        print("No there is no discount for you") # Remove extra indentation here
```

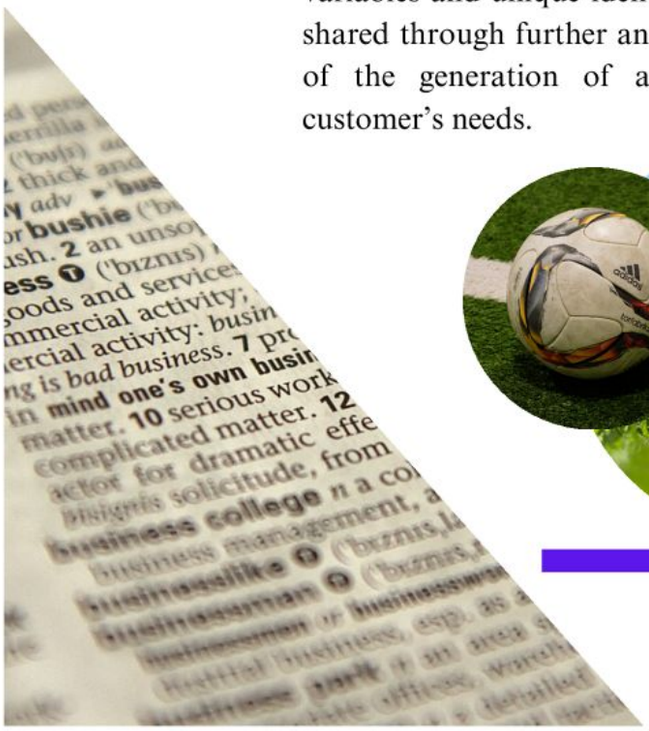
```
Print your age please
65
Yes there is a discount for you
```

```
if age >= 65 or veteran == "Yes":
    print("Your discount is 20%")
else:
    print("Your discount is 0%")
```

```
Your discount is 20%
```

```
# Calculate the cost of each product type
cost_1 = product_prices[product_1] * amount_1
cost_2 = product_prices[product_2] * amount_2
```

Any other instructions must be defined in variables and acquired processes out of additions for taxes, discounts and classes such as the assignation of each value with the options of printing a final outcome for the clerk to be able to determine a total or subtotal. In the case of a Data Analyst (DA) he or she could use this information for the variables and unique identification of any categories or segments been shared through further analysis for the insights building in the process of the generation of any visualizations later on regarding the customer's needs.



Results and Investigation

```
# Calculate the cost of each product type
cost_1 = product_prices[product_1] * amount_1
cost_2 = product_prices[product_2] * amount_2
cost_3 = product_prices[product_3] * amount_3

# Calculate the total cost before discount
total_cost_before_discount = cost_1 + cost_2 + cost_3

# Apply the discount
total_cost = total_cost_before_discount * 0.8

print("Total cost: ", total_cost)
print("Your final purchase with the available discount is on:",total_cost)
```

```
Total cost:  6.0
Your final purchase with the available discount is on: 6.0
Thanks for shopping with us
```

```
[ ]  ###Print the customers final cost - 15% Tax on Sale (TOS), please
     # Use a dictionary to store product prices
     product_prices = {
         "Socks": 1.50,
         "Tee": 24.99,
         "Pants": 40.99,
         "Toques": 16.29,
         "Hats": 19.99,
         "Trainers": 29.99
     }
```

Every consideration must be defined with time for any customization inside of the learning from Python to compute any calculations based on the training by variables of the system.

Results and Investigation

```
}
print("Insert every product and amount in the shopping cart, please!")
product_1 = input()
amount_1 = int(input()) # Convert amount to an integer

product_2 = input()
amount_2 = int(input()) # Convert amount to an integer

product_3 = input()
amount_3 = int(input()) # Convert amount to an integer


# Calculate the cost of each product type
cost_1 = product_prices[product_1] * amount_1
cost_2 = product_prices[product_2] * amount_2
cost_3 = product_prices[product_3] * amount_3

# Calculate the total cost before discount
total_cost_before_discount = cost_1 + cost_2 + cost_3


print("Now your final Sale with a 15% Tax on Sale (TOS) is of: Canadian Dollars (CAD) $.")
total_cost = total_cost_before_discount * 0.8
(print(total_cost))

###Total Cost (total_cost) minus the 15% Tax on Sale (TOS) insertion.
total_cost = total_cost * 1.15
print(total_cost)
```

Eventually, the code and the computer's capacity to learn a logic is built through a large series of input(), print() for text operations and the variable designations where many restrictions can get into the need for desirable instructions to cover the suggested instructions such as the addition of taxes and discounts if applicable for the customer's sale.

Results and Investigation

+ Code + Texte

```
[ ] ###Total Cost (total_cost) minus the 15% Tax on Sale (TOS) insertion.
    total_cost = total_cost * 1.15
    print(total_cost)
```

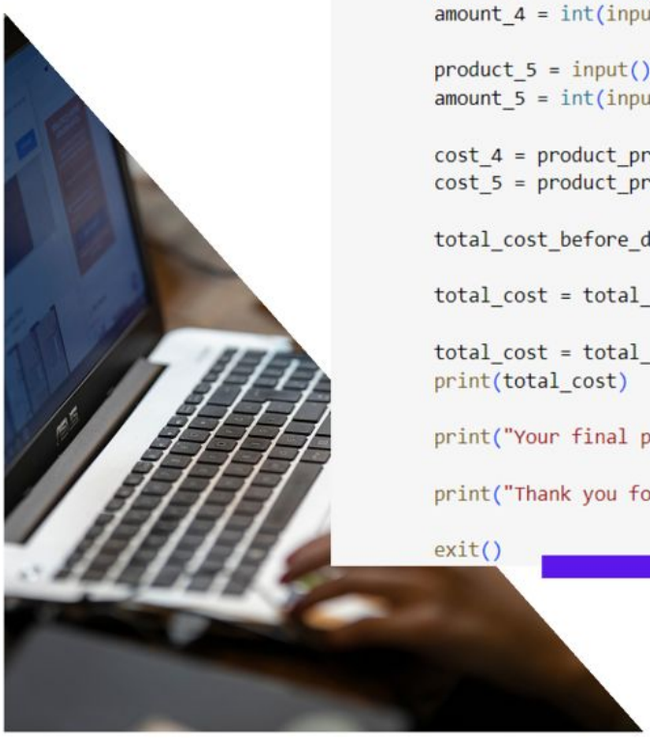
```
Insert every product and amount in the shopping cart, please!
Socks
2
Toques
2
Trainers
33
Now your final Sale with a 15% Tax on Sale (TOS) is of: Canadian Dollars (CAD) $.
820.2
943.23
```

Q7. Are you done with the any purchases?

Taskline 7 T7.

The closing of a program or dataset's analysis can be done as final modifications to variables, restrictions and potential needs for a system can become eased by the ideal usage of any possible variables.

```
[ ] print("Are you done with all your purchases?")
    if input() == "Yes":
        print("Thank you for shopping with us!")
        exit()
    else:
        print("Please continue shopping")
        print("Please enter more articles and amounts for your purchases!")

        product_4 = input()
        amount_4 = int(input()) # Convert amount to an integer

        product_5 = input()
        amount_5 = int(input()) # Convert amount to an integer

        cost_4 = product_prices[product_4] * amount_4
        cost_5 = product_prices[product_5] * amount_5

        total_cost_before_discount = cost_1 + cost_2 + cost_3 + cost_4 + cost_5

        total_cost = total_cost_before_discount * 0.8

        total_cost = total_cost * 1.15
        print(total_cost)

        print("Your final purchase with the available discount is on:",total_cost)

        print("Thank you for shopping with us!")

        exit()
```

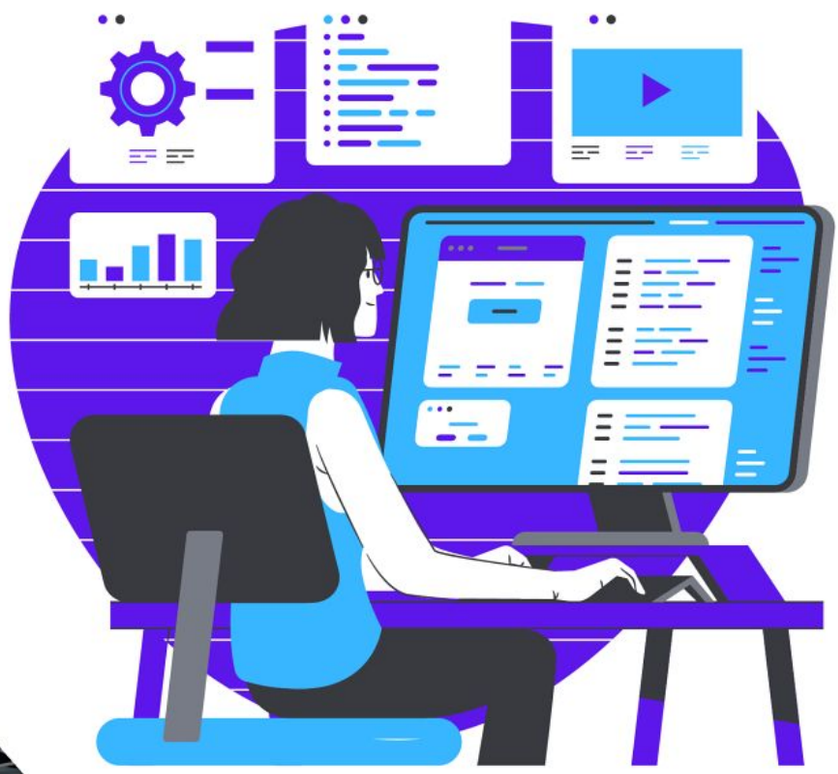


Results and Investigation

```
Are you done with all your purchases?
No
Please continue shopping
Please enter more articles and amounts for your purchases!
Socks
2
Socks
33
991.53
Your final purchase with the available discount is on: 991.53
Thank you for shopping with us!
```

--END--

Any Data Analyst (DA) or programmer can always come back to establish any possible missing points or any changes to the final closing of the code.

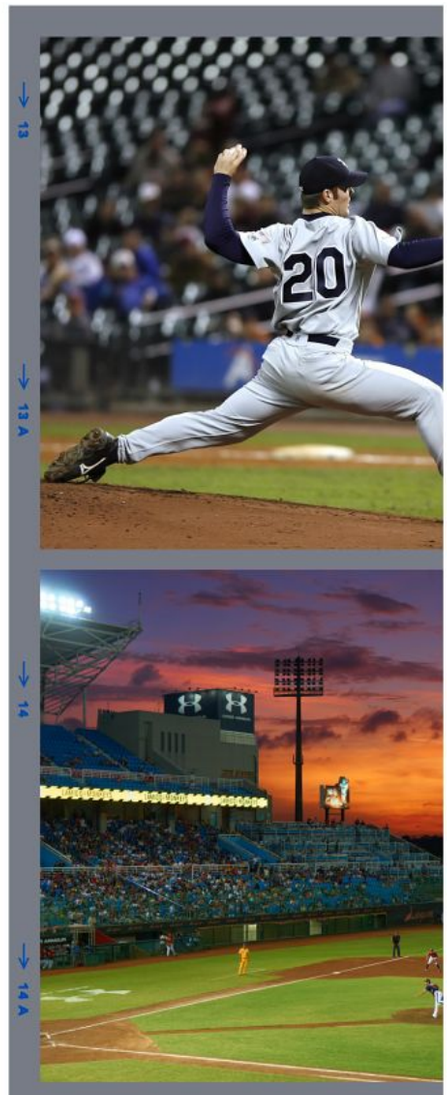


Results and Investigation

Observations:

- Another manner of listing and previously filtering specific data or information is through the usage of “index()” for the selection of a specific article from an array or group of data.

- However, an amazing discovery I could make based on the summary from experimentation with the values and the commands used in Python is how many libraries and sets of data re conveyed and transformed into a whole variety of different sets of instructions like the recognition of a unique variable such as “product_cost=(product_1*amount_1 + product_2*amount_2+...)”, nevertheless, it is essential to also set some questions before any process from our perspective such as “Why are making this Data Analysis Process (DAP), program or any calculations for the processing of units inside of an established situation?, Who is our target for the usage of the data or computing of processing units?, How will any issues impact our inventory as a retail-store in the case of Decathlon Burnaby, British Columbia (BC), Canada?, Is the mapping of data and the research process being taken in the meeting of requirements?, How can the process management be improved within the analyzed or introduced data?, What works for us Data Analysts or Business Analysis Managers or Business Analysts for the role of determining a proper solution? Can we mix Python with other languages and scripts such as Perl, Ruby or R / Matlab?, Is everyhting explainable to people with no mathematics background or Machine Learning (ML) knowledge? How to bring feedback six months later for better solutions?” and many more search tasks for better process management in general.



Results and Investigation

Observations:

- As a Data Analyst (DA) or Business Analyst (BA) role the most important matter in Python is to have a glance at what can be done and coming up with innovative solutions. On the other hand, being afraid of coding can be tough but never impossible as all the systems engineers make-up many mistakes upon the process of coding or even ask to fellow classmates / workers in the field with sources like Chat GPT if used with caution or even Stack Overflow. This means if someone is "Bad" at mathematics and coding will never success? Well, the answer is no, there is no such thing as bad in those fields as the applications and the spectrum for the learning curve are huge. Where many jobs require in various manners to know about these topics, nevertheless, more in general terms for any solutions. Is Artificial Intelligence (AI) a menace to any Python or analyst jobs? Absolutely no, these are tools for the ease of mankind in daily tasks. They must be used responsibly.

- An, "AHA!" moment for any Data Analyst (DA) or just Python aficionado to coding and improving skills is when the code finally runs giving summary to all the process which the learner is exposed to as the feeling of accomplishment is magic for the learning curve.

Brief Summary

Summary:

- Python gives an entire opportunity set for the logic command management regarding the generation of any programs or any script towards the massive data analysis as it can help us approach samples of “Data Lakes” for the optimization of the procedures of generative answers into the data needs and filtered suggestions including the creation of a better expansion towards the usage of unique variables and facing challenges with the environment development out of a Python learning process with the notebooks and codes.
- The ideas which can come out of the imagination of any Data Analytics Team (DAT) is wide as many brainstorming process is also an essential part of the change management and the market needs visualization help for the insight and possibilities with a “What-If Analysis?” and the partitioning of any conflicts into smaller questions delivered by teams for the final product a company or customer may be needing in a specific time or for a contingency planification before any catastrophe.

Conclusion

Conclusion:

- Foremost, Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL) and other trends regarding Big Data (BD) give insights for the generation of conflict management out of technological innovation for the productive answering of questions in a rapid but optimal manner regarding the implications of variables, tasks, commands, specialized fields for the massive dataset's analysis and converting all this data into rich mines of new ideas projected into the future for possibilities out of millions scenarios.

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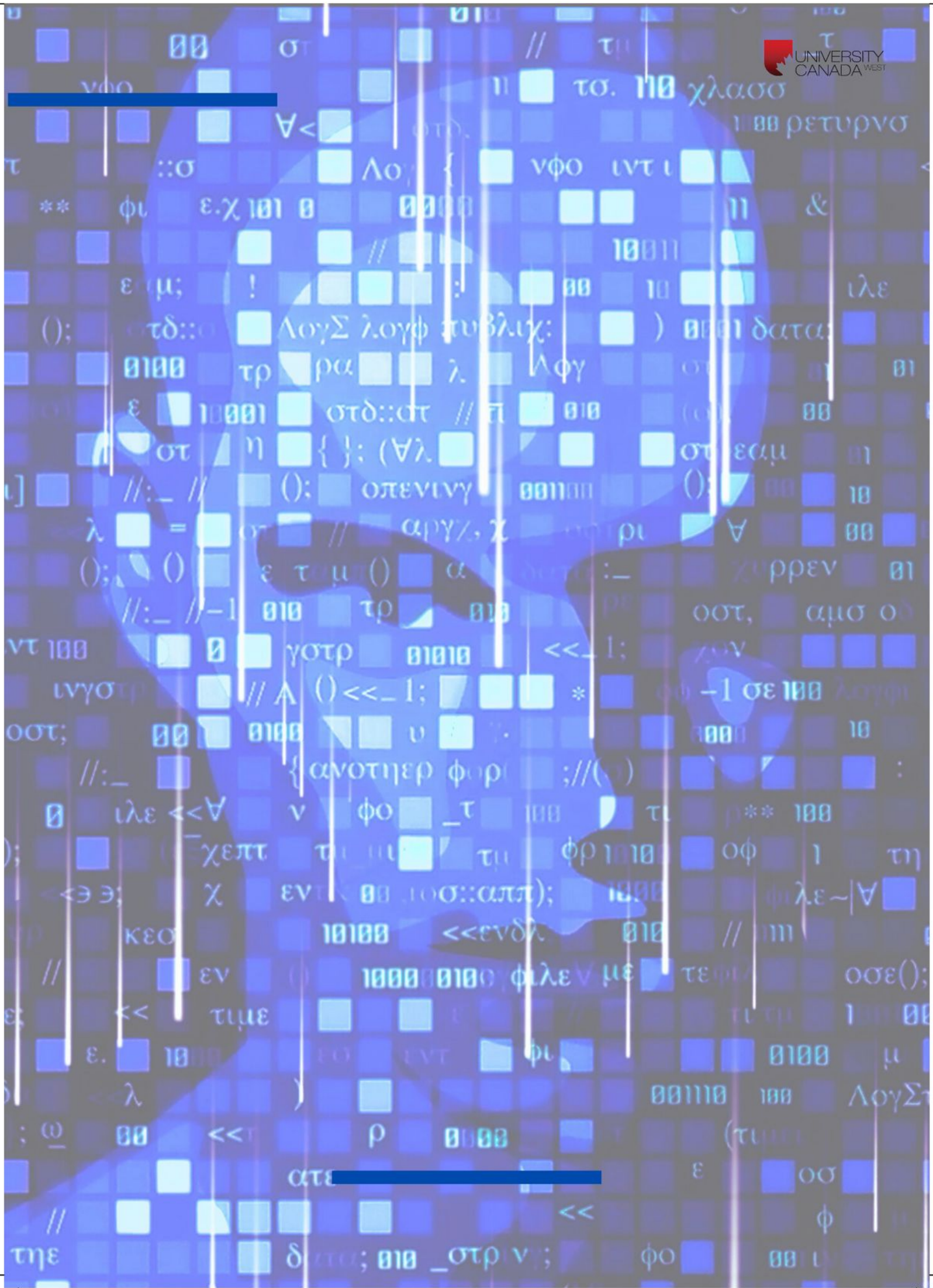
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