

## QUESTION:

### PART 1: Programming

In the programming part, you are to create a Python - based program that can be useful for **Human Resources department**. This program is a prototype and proof - of - concept to path the **subsequent implementation, development to desktop/kiosk, internet, or mobile platforms.**

Some ideas are listed below for your reference:

- **Onboarding process:** Onboarding is a process within business organization to get new employees started and be more familiarized with the organisation. A good onboarding process reduces turnover of the organization. Some of these processes involve repetitive task like filing up forms after forms. You can create a program to move away from paper works to a program that prompts new employees to enter information into the system. **The program allows different roles of user to login:** HR personnel, different departmental managers, etc. It then allows customization on what can each user sees from the HR system. It could also have features allowing HR personnel to create some onboarding exercises or quizzes, create a series of process for new employees to complete (to-do list), or gather feedback after the employee has completed the on-boarding exercises.
  - Employee orientation - smth like ntulearn acct (elearning, etc) things that don't have to be taught directly
  - Mini quizzes & videos to intro the different departments
  - Portal to have updates ion info and processes in the company, i,e intro to announcement system
- **Claims or leave management system:** Have a centralized system to submit different types of claims, check, process and route to the corresponding manager of cost centres for approvals. Leave management system that allocates leave entitlements according to job's grade. You can think of some useful features like computing the leave balance at the end of each month, provide corresponding message or alerts to report if leave has been under or over utilized.
  - Smth like a form to fill in to send into the system (One-stop interface)
  - Hr system will be able to see what ppl are applying for, what they have already collected(leave) , how much will be left aft they collect, etc.
- **Rewards and recognition system:** Develop a platform that encourages co-workers or superiors to nominate or recognise good works' done by employees. Or a recognition system that keeps track of the performance of workers closely or provide interim incentives or awards recognition. The objective is to retain and motivate staffs.
  - Boss do & ownself do to see if it is equal? Or about equal
  - A way of giving feedback
  - See how the company can improve itself

- Kind of open ended + self rating (will not prompt for a response)
- **HR chatbot:** Create a program that can handle basic enquiries by staffs. You could start with creating a set of questions and answers. Load the Q&A into the program and start to have some conversation with employees. The chatbot could be targeted at a specific part of HR function like automating first round of interview process, advising employees on how to make insurance claim, or procedures to clear for staff leaving an organization.
  - Q&A: to deal w the diff queries: smth like saq, unless its a v complicated qn (HR to follow up)
- Attendance: clocking in attendance, system to
- Tracking different training records: Performance management & skills development
  - Learning directory
    - See which lvl staff is at
    - Sent for course
    - Evaluate after to see if there are improvements

You are not limited to the above ideas and are highly encouraged to find inspiration from people/organization you know. Design a useful and unique program for them.

## OUR PROJECT: **MARKETING DEPT**

(Assuming that the supervisor will enter the page and enter their position in the company i.e. select marketing supervisor.)

Assume the hr dept have already classified the learning directory by different skill set

Assume that under the different skillset, there are various levels to it.

Disclaimer: HR personnel cannot fill up their own particulars in the system

Only 1 HR personnel will input the data at one time. The system will have only 1 output about the employee in the supervisor's department to decide which course to send them too.

First prompt:**System asks for identity:**

HR dept: aaaa

Supervisor: bbbb

Other (everyone else): cccc

If the identify matches **aaaa**,

Proceed this set of instruction:

1. Key in name
  2. Key in employee id
  3. HR rept assign a level to every employee
    - L1: Frontline workers
    - L2: behind the scenes intern
    - L3: Specialists
    - L4: Manager
    - L5: Director
  4. System will show a list of all the skills existing in the company and HR personnels are to choose those relevant to that employee (can choose more than 1)  
(e.g. competency list)
    - Critical Thinking/Problem Solving.
    - Oral/Written Communications.
    - Teamwork/Collaboration.
    - Information Technology Application (digital skills)
    - Leadership.
    - Professionalism/Work Ethic.
    - Career Management
    - Marketing and advertising
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5. System will run through each skill and ask for appraisal. This step continues until all the appraisal scores for all the skills chosen have been given.

6. System will generate whether the applicants are a **beginner/intermediate/advanced learner** for the respective skills.
    - a. If the aggregate score for that skill set is 0 to 3, **beginner** course
    - b. If the aggregate score for that skill set is 4 to 6 , **intermediate** course
    - c. If the aggregate score for that skill set is  $\geq 7$  , **advanced** course
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7. System will generate all the courses relevant to the *various skills chosen + the proficiency level they are at*
  8. System ask HR rept will indicate the different courses already attended (that is on the existing list of courses)
  9. System will generate a list of courses recommended to that specific employee based on the current levels of the various skillset
  10. Export data to CSV file/ via panda and upload it to cloud.
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If the identify matches **bbbb**,

Proceed this set of instruction:

1. Supervisor will download the same csv file from that cloud and import the csv
  1. System asks supervisor to indicate the employee's id
  2. System will automatically generate a list of courses recommended to that specific employee based on the current levels of the various skillset
  3. Function to print out the information regarding the course WHEN PROMPTED- additional information for the hr personnel to decide on the course to send the staff to: qualitative analysis to be done by human
  4. System to ask supervisor to indicate what is the final course chosen for the employee
  5. Export data to CSV file/ via panda
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If the identify matches **cccc**,

Proceed this set of instruction:

1. System asks employee to indicate their ids
2. System to show the relevant courses that the employees will attend

**>>> maybe system can prompt for an email to be sent to the employees to check**

**\*panda → import panda and use panda to create a dataframe function (one shot trnf data out)**

**--> df.to\_csv()**

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Moving from here.

1. Add more dimensions (have more roles using this process - employees, supervisors and HR managers)
2. To identify the job role of the login user → can ask directly for job role/level or can ask for the login user employee id and the system can pull out the specific data

Eg

If HR manager, show the HR manager menu

<Year-end evaluation/half-yearly evaluation> [KIV]

1. Read it in the first csv file created in phase 1
1. Key in name
2. Course that was previously attended will show up \*\* need to take out the previously attended course at this stage (??)
3. Attain the aggregate score for each skill set previously chosen
  - If the aggregate score for that skill set is 0 to 3, beginner course
  - If the aggregate score for that skill set is 4 to 6 , intermediate course
  - If the aggregate score for that skill set is  $\geq 7$ , advance course  
(define it as a new function, DONT repeat code)
4. System to generate the current level for each skill set the person is at
5. System will generate all the courses relevant to the various skill set alr chosen

\*\* If the candidate has already completed all the courses at that stage, system gives the option to the HR rept if they want to advance that candidate to the next level (if/else)

6. Function to print out the information regarding the course WHEN PROMPTED-  
additional information for the hr personnel to decide on the course to send the staff to:  
qualitative analysis to be done by human
  - **Must substantiate** our decision that humans should ultimately be the last person to make the decision rather than a computer
7. HR rept to indicate what is the final course chosen for the employee

Traits	Performance	
Analyses and evaluates problem and recommends appropriate solution (Group)	<b>Not Yet</b> No analysis of problem and no solution is provided. Contradicting analysis is given.	<b>Substantially Developed</b> Excellent analysis of problem and propose well supported solution. Solution illustrates coherent understanding to solve the problem. Provides convincing analysis and solution.
	Evaluation: Not Yet <a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> Substantially Developed	
Identifies and source for appropriate data and provides additional analysis related to the issue. (Group)	<b>Not Yet</b> Merely repeats information provided, taking it as truth, or denies evidence without adequate justification. Inadequate analysis and lack of understanding on data.	<b>Substantially Developed</b> Examines the data and source of evidence; questions its accuracy, precision, relevance, and completeness. Carefully examines data with substantiated analysis supported by evidence.
	Evaluation: Not Yet <a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> Substantially Developed	
Relevant Content (Group)	<b>Not Yet</b> Content is erroneous or irrelevant; references and supporting materials are absent. Lacks of depth in content and little insights are exhibited. Presentation falls outside set time parameters. Lack of appropriate visualization.	<b>Substantially Developed</b> Content is accurate, thorough, and directly on point; strong support and references are provided. Exhibits depth and insight in content. Effective use of time and stays within time parameters. Excellent use of visualization to present data.
	Evaluation: Not Yet <a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> <a href="#">6</a> <a href="#">7</a> <a href="#">8</a> <a href="#">9</a> <a href="#">10</a> Substantially Developed	
Communication Outcome (Individual)	<b>Not Yet</b> Central message is not explicitly stated in the presentation. Main points are not clearly identified, audience unsure of the direction of the message.	<b>Substantially Developed</b> Central message is precisely stated; main points are clearly identified. Effectively communicate the ideas.
	Evaluation: Not Yet <a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> Substantially Developed	
Communication Structure (Individual)	<b>Not Yet</b> No clear structure, no explanation for solution. Organizational pattern (specific introduction and conclusion, sequenced materials within the body, and transitions) is not observable.	<b>Substantially Developed</b> Organizational pattern is clearly and consistently observable and makes the content of the presentation cohesive.
	Evaluation: Not Yet <a href="#">1</a> <a href="#">2</a> <a href="#">3</a> <a href="#">4</a> <a href="#">5</a> Substantially Developed	