

INTERNSHIP PROGRESS REPORT

Submitted in the partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING IN CSE-MOBILE_COMPUTING

Submitted by:

HARDIK CHAUHAN

19BCS4325

**AT
HIGHRADIUS CORPORATION**

Under the Supervision of:



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

APEX INSTITUE OF TECHNOLOGY

CHANDIGARH UNIVERSITY, GHARUAN,

MOHALI - 140413, PUNJAB

APRIL-2023

MONTHLY INTERNSHIP REPORT

A. Internship Contact Information

Student Name	HARDIK CHAUHAN
Student UID	19BCS4325
Student Email (@cuchd.in)	19BCS4325@CUCHD.IN
Student Contact No.	7906862186
Internship Organization Name	HIGHRADIUS CORPORATION
Organization Address	BHUBANESHWAR, ODISHA, INDIA
Internship Supervisor	ROHIT
Internship Supervisor Phone	
Internship Supervisor Email	rohit.burman@highradius.com
Report period (start date)	01-06-2022
Report period (end date)	22-04-2023

B. Distribution of hours:

Orientation **NA**

Observing **NA**

Meetings (e.g., staffing, working with the team, etc) **NA**

Lectures, Seminars, Conferences **NA**

Assessment **NA**

Planning (activity analysis, goals and objectives, etc) **NA**

Studying/Researching **NA**

C. Implementation (in hours which so ever is applicable. Otherwise mention Not Applicable):

a. Leadership **NA**

b. Counselling **NA**

c. Supervision **NA**

d. Evaluation **NA**

e. Documentation **NA**

f. Discharge/Transition Plans **NA**

g. Other (Please specify) **NA**

OFFER LETTER

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Internship Offer Letter

Dated: 28th May, 2022

HighRadius Technologies Private Limited

HighRadius Technologies Pvt. Ltd
4th Floor, Campus-3, KIIT
Bhubaneswar, Khordha, Odisha- 751024,
hereinafter referred to as "HighRadius"

AND

Chandigarh University

Punjab - 140413
hereinafter referred to as "CU"

AND

Name: Hardik Chauhan
Location: Bhubaneswar
Roll Number: 19BCS4325
Graduation Year: 4th Year
enrolled as a student in the B.Tech Programme offered by CU hereinafter referred to as "Candidate"

The above-named parties have agreed to the following:

1. Introduction:

The Hghako program is an industry-institute partnership initiative of HighRadius for engineering undergraduates. Candidates offered participation in this program shall be trained at the Centre of Excellence established at KIIT's premises at Bhubaneswar, and, based on the internship programme for which such Candidates are eligible, shall be paid a fixed stipend for the duration of their internship. Upon successful completion of their engineering qualification and satisfactory performance during the training period, HighRadius may, at its sole discretion, further employ these candidates in accordance with HighRadius' existing terms and conditions of employment. The Hghako program shall be considered by CU for giving academic credit to the Candidates, in accordance with the guidelines determined by HighRadius and CU.

2. Terms of the Training Program conducted by HighRadius

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2.1. HighRadius Internship Programme:

- Term of Full Internship Programme: The Candidate shall commence the full internship on **01-04-2022** and shall be on training for a period of 1 (one) year from the date of commencement of the paid internship at the Centre of Excellence at KIIT's premises at Bhubaneswar.
- The Internship Period of one year can be extended as per the Business Requirement.

2.2. Internship Work

- The work timings during the training period, as set out in article 2.1 above, shall be from 9:30 a.m. to 6:30 p.m. on weekdays (Monday to Friday). Working days and times are subject to changes based on the need and urgency of a project and HighRadius' requirements, which shall be duly communicated. The Candidate may be required to come to work during the weekend based upon schedules of training, as per the availability of trainers.
- During the internship, the Candidate shall be required to work on complex and specialized projects for the clients of HighRadius. The Candidate understands and acknowledges that he/she is required to receive training, which shall be imparted directly or indirectly by HighRadius to enhance his/her skills, and also to be properly equipped with the necessary technical and practical training, without which the Candidate cannot effectively perform his/her duties and responsibilities.
- Towards this end, the Candidate will be required to work closely with a trainer who will guide the Candidate and equip the Candidate to perform his/her duties and responsibilities effectively. During the term of the internship, the Candidate shall follow the directions of the trainer.
- Post the internship, HighRadius may at its sole discretion, make an offer of employment to the Candidate, based on his/her performance and conduct both academically and during the internship. In the event the Candidate accepts the offer of employment made by HighRadius, then the Candidate and HighRadius shall execute a separate employment agreement which will (in addition to HighRadius' policies) govern his/her terms of employment. It is hereby clarified that prior to being offered employment, the Candidate will be evaluated and assessed, amongst other things, on his/her performance, communication skills, attitude to work, satisfactory references and background checks.
- HighRadius reserves its right to decide the place and kind of training to be imparted to the Candidate.

3. Compensation and Other Benefits

- During the full internship, the Candidate shall be entitled to a monthly stipend of Rs. **24,500/-** per month (which is inclusive of Rs 500 towards entertainment allowance) subject to TDS, and other statutory deductions. The stipend shall be paid in accordance with HighRadius' policies.

- The Candidate shall be entitled to 1 (one) day of leave per month on use it or lose it basis. However, the management of HighRadius shall review any specific requirement of leave for emergency, medical or other necessity.

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- The Candidate will not be entitled to any benefits and/or payments from HighRadius, except as specifically mentioned herein.

4. Performance during training period

The Candidate will be evaluated on his/her work performance based on assessment & interim reviews and other factors determined by HighRadius. Satisfactory performance during the training is necessary for the Candidate's participation in the internship program being considered successful. Upon successfully completing the internship, the Candidate will be given a certificate of completion by HighRadius.

5. Code of Conduct

5.1. During the Internship, the Candidate shall:

- maintain discipline, confidentiality, be punctual and follow the non-disclosure norms, not disparage HighRadius and serve honestly, faithfully, diligently and efficiently for the growth of HighRadius;
 - conduct himself/herself in consonance with the Policies & Guidelines and the Code of Conduct of HighRadius, as in force from time to time;
 - carry out the instruction in letter & spirit given by his/her superiors and not disobey any instructions given nor rebuke or use offensive language;
 - not indulge in any unethical practices like "go slow" or non-cooperation etc;
 - apply and maintain the highest standards of professional and personal conduct and integrity;
 - in case of illness and absence on account of the same, the Candidate shall immediately inform the trainer and HighRadius; and
 - Code of conduct of university will be applicable apart from the conduct called out here.
- In case the Candidate wishes to take a leave for any reason other than illness, then the Candidate shall make an application for the same to HighRadius at least 15 (fifteen) days prior to the date on which the Candidate wishes to take a leave.

5.2. Prevention of Sexual Harassment at work place:

The Company will have zero tolerance towards sexual harassment, if engaged in by Interns:

The workplace includes, but is not limited to:

- All offices, University or other premises where the Company's business is conducted.
- All company-related activities performed at any other site away from the Company's premises, including transportation provided to undertake such journey.
- Any social, business or other functions where the conduct or comments may have an adverse impact on

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the workplace or workplace relations.

Sexual Harassment at the workplace includes:

- Unwelcome sexual advances (verbal, written or physical),
- Demand or request for sexual favours,
- Showing pornography,
- Any other type of sexually-oriented conduct,
- Verbal abuse or 'joking' that is sex-oriented,
- Impplied or explicit promise of preferential treatment in employment,
- Impplied or explicit threat of detrimental treatment in employment,
- Impaired or explicit threat about present or future employment status,
- Interferences with work,
- Creating an intimidating or offensive or hostile work environment,
- Humiliating treatments likely to affect an individual's health or safety.

Note: If any of the interns are found to be involved in violation of code of conduct or sexual harassment as stated above or anything which implies so, it would result in termination with immediate effect.

6. Confidential Information and Non-Disclosure

- The Candidate is aware that, during the course of his/her internship with HighRadius, information related to HighRadius or its client may be disclosed to him/her and all such information in relation to this letter, including, without limitation, information relating to HighRadius' or its clients' products and services or to its research and development projects or plans, information relating to HighRadius' or its clients' business, marketing and sales plans, strategies, operations, finances, plans or opportunities, including the identity of, or particulars about HighRadius' or its clients' employees, contractors, customers or suppliers, information not limited to technology, tools, processes, methods, business, data, pricing methods, software code, vendor and customer information and lists, employee lists, data handling methodology and processes, and research processes and strategies, business process and any other information related to any project information marked or otherwise identified as confidential, restricted, secret, or proprietary, including information acquired by inspection or oral or visual disclosure or disclosure through electronic media, any other information disclosed under circumstances in which a reasonable person would understand that such information is confidential and proprietary to the disclosing party ("Confidential Information").

- In addition to this, Confidential Information shall also include all the work created and/or all the services provided by the Candidate during the course of the Internship, and/or any part thereof, the affairs of HighRadius, its subsidiaries, its affiliates and/or its parent company and any and all information, whether written or oral, which directly or indirectly relates to internal controls, computer or data processing programs, algorithms, electronic data processing applications, techniques or systems, or information concerning the business or financial affairs and methods of operation or proposed methods of operation, accounts transactions, proposed transactions, security procedures, trade secrets, research and

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development activities, know-how, or inventions of HighRadius and/or its subsidiaries, affiliates, associated companies, parent company or any client, agent, contractor or vendor, or any other information that comes to the Candidate's knowledge by reasons of his/her internship with HighRadius.

HighRadius may disclose its own Confidential Information as well as that of its affiliated companies to the Candidate and the Candidate may also be privy to information pertaining to the clients of HighRadius. All such information shall be protected under this Article 6.

6.3. Confidential Information is the sole and exclusive property of HighRadius or its client and shall be used only as expressly permitted in this letter and for the purposes of creating work and/or providing services to HighRadius or its clients. Confidential Information shall not be disclosed or revealed by the Candidate to any third party at any time, even post completion of the Internship, without the prior express written consent of HighRadius.

6.4. The Candidate is aware that, during the course of his/her internship with HighRadius, Confidential Information, as defined above, related to HighRadius or its Client would be disclosed to him. The Candidate agrees that:

- any Confidential Information, including but not limited to, written, audio, electronic or visual embodiments thereof, is the property of HighRadius and/or its client and is to be held by him/her in trust solely for the benefit of HighRadius and shall not be used or copied for purposes not specifically provided herein or disclosed to others at any time;
- all original material, including programs, disks, cards, decks, tapes, listings, including notes, extracts, copies, summaries or other reproductions of any kind and other programming documentation originated and prepared for or by HighRadius or its client is material deemed to contain Confidential Information;
- he/she shall undertake to protect the Confidential Information disclosed to him/her, using the same degree of care as the Candidate uses to protect his/her own comparable confidential and proprietary information to prevent its unauthorized use, disclosure, dissemination or publication, but no less than a reasonable degree of care;
- he/she may disclose Confidential Information only to authorized persons who have a need to know and are bound by obligations of confidentiality;
- any permitted reproduction of Confidential Information shall contain all confidential or proprietary legends which appear on the original;
- upon the termination of his/her services with HighRadius or at the request of HighRadius, whichever is earlier, the Candidate shall return to HighRadius all documents and property of HighRadius or its client, including but not limited to: laptops, drawings, blueprints, reports, manuals, correspondence, customer lists, computer programs, and all other materials and all copies thereof relating in any way to HighRadius' or its clients' business, or in any way obtained by him/her during the course of the Internship. The Candidate further agrees that he/she shall not retain any copies, notes or abstracts of the foregoing;
- he/she shall not during or any time after the termination of his/her services with HighRadius, use for himself/herself or others, or disclose or divulge to others any trade secrets, Confidential Information, or

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gain. Further, the Candidate shall not disclose any intellectual property rights in the work created and/or the services provided by him/her during the course of the Internship, and/or any part thereof to any third party and shall be bound by the provisions of Article 7 of this letter.

7.5. The Candidate shall immediately return to HighRadius any and all of the intellectual property of HighRadius in his/her possession or under his/her control upon termination of the Internship. Without the prior written consent of HighRadius, the Candidate shall not retain any copies or records of the intellectual property of HighRadius.

8. Restrictive Covenants

8.1. Non-Disparagement.

8.1.1. At all times during the Candidate's Internship, and upon and at all times following the cessation of the Internship for any reason whatsoever, the Candidate, whether for his/her own benefit or the benefit of any other person or entity, shall refrain from making any adverse communications, disseminations or statements, whether in writing or oral or any other form (including electronic, mail or online disseminations or statements), directly or indirectly, which the Candidate knows or reasonably should know to be disparaging, negative or capable of causing harm to the reputation of HighRadius and/or any of its affiliates, subsidiaries or its parent company, employees or the business endeavours of the HighRadius and/or any of its affiliates, subsidiaries or its parent company.

8.1.2. The Candidate shall also refrain from suggesting or urging anyone to make any adverse communications, disseminations or statements, whether in writing or oral or any other form whatsoever, concerning HighRadius or any of its affiliates or subsidiaries or its parent company or employees or the business endeavours of HighRadius or any of its affiliates or subsidiaries or its parent company.

8.2. Non-compete.

During the Internship and for a period of one year following the termination of the Internship for any reason whatsoever, the Candidate shall not, directly or indirectly, individually or in combination or association with any other person or entity, whether as an officer, director, employee, shareholder, member, partner, joint venture, sole proprietor, agent, independent contractor, consultant, advisor or otherwise, whether or not for pecuniary benefit, engage in or own (in whole or in part), manage, loan money to, operate or otherwise carry on any business which competes with the business of the HighRadius.

8.3. Non-Solicitation of Clients and Prospects

During the Internship and for a period of one year following the termination of the Internship for any reason whatsoever, the Candidate shall not, directly or indirectly, for his own benefit or the benefit of any third party (a) hire or contract for the services of any employee of HighRadius, (b) call upon any of HighRadius' clients for the purpose of soliciting, selling, or both, any product or service that can or may be used in substitution for or replacement of services or products offered by HighRadius, (c) solicit or have any discussion with HighRadius' clients or any employee of HighRadius concerning any assignment or

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any other proprietary data of HighRadius in violation of the confidentiality obligations under this letter; and

h. he/she shall promptly advise HighRadius in writing of any unauthorized use or disclosure of Confidential Information of which the Candidate becomes aware and shall provide reasonable assistance to HighRadius to bring about the cessation of such unauthorized use or disclosure.

6.5. Breach of this Article 6 shall be treated as a gross violation of the terms stipulated herein and may be treated as serious offense resulting in prosecution, in addition to the Candidate's services being liable to be terminated forthwith.

6.6. In the event that disclosure of any Confidential Information is required under any applicable laws or at the direction or in accordance with any order of any governmental authority or of any court of competent jurisdiction, the Candidate shall, upon becoming aware of such requirement, direction or order, promptly inform HighRadius of the same.

7. Ownership of Intellectual Property:

7.1. The Candidate agrees and acknowledges that all the intellectual property rights in any form of work done or services provided by the Candidate during the Internship, or any part thereof, will at all times belong to HighRadius. The Candidate agrees that all the work created and all the services provided by him/her during the course of the Internship, and any part thereof, shall be deemed to be 'work for hire' at the instance of HighRadius in accordance with the Copyright Act, 1957.

7.2. The Candidate hereby agrees and acknowledges that neither by virtue of any provisions contained herein nor by participation in the Internship programme shall the Candidate obtain any rights of any kind whatsoever over any work created and/or all the services provided by him/her during the course of the Internship. The Candidate agrees that he/she shall not lay any claim over any work created and/or all the services provided by him/her during the course of the Internship.

7.3. The Candidate shall sign all documents related to his/her Internship, including: (a) non-disclosure agreements, (b) agreements for assignment of intellectual property rights in work created and/or all the services provided by the Candidate during the course of his/her Internship, and/or any part thereof, (c) consent forms, (iv) release letters, (d) letters appointing HighRadius as his/her attorney and representative, (e) any other documents, as may be required to perfect the title of HighRadius over intellectual property rights in work created and/or all the services provided by the Candidate during the course of the Internship, and/or any part thereof. In the event HighRadius does not get ownership or any other right over the work created and/or all the services provided by the Candidate during the course of the Internship and any part thereof, by virtue of this provision, then the Candidate shall sign such documents as may be required to assign all rights over the work created and/or all the services provided by the Candidate during the course of the Internship and any part thereof to HighRadius. The Candidate shall waive all moral rights in the work created and/or all the services provided by him/her during the course of the Internship, and/or any part thereof.

7.4. The Candidate shall not use any of the intellectual property rights in the work created and/or the services provided by him/her during the course of the Internship, and/or any part thereof for his/her own

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independent contracting with any other entity, and/or (d) induce or attempt to influence HighRadius' clients or any employee or any other person working for HighRadius to terminate any assignment or other contractual arrangement with HighRadius.

8. Social Media and Use of HighRadius Name/Logo

During the Internship, and upon and at all times following the cessation of the Internship for any reason whatsoever, without the prior written consent of HighRadius, the Candidate shall not make use of or otherwise mention HighRadius' name or logo on any social media platform in connection with the Candidate's Internship, including but not limited to LinkedIn, Facebook, Instagram, or YouTube.

8.5. The provisions of this Article 8 shall continue to operate and apply after the termination of the Candidate's Internship without limit in time.

9. Data Protection

9.1. The Candidate consents to HighRadius collecting, recording, holding, processing and sharing and transferring to associated companies (whether in India or outside) the information pertaining to him/her for the purposes of the Internship programme and possible employment of the Candidate.

9.2. HighRadius hereby agrees and acknowledges that it shall use the abovementioned information for the sole purpose stipulated in this letter. HighRadius undertakes that the above-mentioned information shall not be used by it for any other purposes without the prior consent of the Candidate.

9.3. Notwithstanding the above, HighRadius may share information pertaining to the Candidate with governmental authorities mandated under the law to obtain information for the purpose of verification of identity, or for prevention, detection, investigations of any cyber incidents, prosecutions, punishment of offences, etc. It is further clarified that HighRadius may also disclose the information pertaining to the Candidate to any third party pursuant to applicable law or an order passed by a governmental authority.

9.4. The Candidate undertakes to inform HighRadius of any change in the information pertaining to the Candidate within five (5) working days of such change taking place.

9.5. Violation of any of the clause called out would be liable for legal course of action.

10. Representations of the Candidate

10.1. The Candidate represents to HighRadius that:

- all information and documents furnished by the Candidate in support of his/her educational qualifications and professional experience are correct and true;
- the Candidate has never been convicted of any offence;
- the Candidate has never, at any time in the past, been found guilty of moral turpitude nor convicted by any court of law; and
- the Candidate will be governed by HighRadius' code of conduct and policies and if there is any breach committed, or non-performance of contractual obligations on the part of the Candidate, including but not limited to the obligations relating to confidentiality, compliance with HighRadius' policies, unethical or unprofessional conduct, his/her services may be terminated by HighRadius

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immediately and without any notice or payment in lieu of notice, notwithstanding any other terms and conditions stipulated herein. HighRadius further reserves its right to invoke other legal remedies as it deems fit, to protect its legitimate interests.

11. Indemnity

- 11.1. The Candidate agrees to indemnify and at all time keep HighRadius, and/or its affiliates and/or its subsidiaries and/or its parent company, fully indemnified from and against all actions, proceedings, claims, demands, infringements, costs and damages (including reasonable attorney's fees) suffered by HighRadius on account of or in connection with the internship or any breach of the terms of this letter.
- 11.2. The Candidate hereby agrees to indemnify, defend, save and hold harmless HighRadius, its affiliates, subsidiaries and/or its parent company from and against all claims, losses, damages, fees, including without limitation reasonable attorneys' fees, costs and expenses (including reasonable attorney's fees, costs and expenses incurred in establishing HighRadius' right to indemnify hereunder) incurred by or on behalf of HighRadius arising out of or in connection with any infringement or alleged infringement of the intellectual property rights owned by HighRadius over the work created and/or all the services provided by the Candidate during the course of the internship.
- 11.3. The maximum aggregate amount of monetary damages for which the Candidate may be liable to HighRadius, resulting from any cause whatsoever, shall be limited to the actual damages suffered by HighRadius. In no event shall the Candidate be liable to HighRadius for any indirect, punitive, special, incidental, consequential, or equitable damages, including but not limited to, loss of income, profits or savings (whether under contract, strict liability, or tort, including negligence) arising out of or in connection with the internship or this letter.
- 11.4. The limitation under Article 11.3 shall not apply to any loss arising on account of (a) fraud on part of the Candidate, (b) willful negligence on part of the Candidate, (c) willful misrepresentation on part of the Candidate, and/or (d) loss, damage, expenses or claims for infringement arising on account of misuse of intellectual property rights in the work created and/or all the services provided by the Candidate during the course of the internship.
- 11.5. In the event the Candidate is unable to indemnify, or unable to fully indemnify HighRadius, then CU, to the extent that HighRadius is not indemnified by the Candidate, shall indemnify HighRadius.

12. Termination

- 12.1. This letter shall expire on the last day of the internship period, as set out in Article 2.1 above.
- 12.2. This letter may be terminated through mutual approval of the parties.
- 12.3. This letter may be terminated by providing a written notice of 10 (ten) days, if:

- a. after consultation with the Candidate, CU is convinced that HighRadius does not fulfill or insufficiently fulfills its duties arising out of or in relation to the internship;
- b. such circumstances arise that it cannot reasonably be demanded of the Candidate or CU to continue his/her internship;

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- c. during the internship, the Candidate's performance or conduct is not up to required standards, then HighRadius may choose to terminate his/her internship with HighRadius after giving 10 (ten) days' notice or payment of stipend in lieu of the notice period along with taxes as applicable;
- d. during the internship, the Candidate breaches any of his/her contractual obligations, or fails to perform his/her contractual obligation, including but not limited to the obligations in relation to confidentiality, non-disparagement, compliance with HighRadius' policies, or acts in an unethical or unprofessional manner, his/her services may be terminated forthwith without any notice or payment in lieu of notice. HighRadius further reserves its right to invoke other legal remedies as it deems fit, to protect its legitimate interests.

12.4. Notwithstanding the above, HighRadius reserves the right to terminate, forthwith, the internship, if the Candidate is found to have absented himself/herself for 5 (five) days without prior permission, misbehaved, committed financial irregularity, has acted in a manner inconsistent with the Policies of HighRadius and/or in a manner prejudicial or harmful to the interest of HighRadius.

13. Assignments/transfer/Deputation

- 13.1. The initial place of work of the Employee will be at Bhubaneswar. However, Employee services are transferable, and the Employee may be assigned, after reasonable notice and mutual consultation, to any location in India or abroad where the Company or any of its subsidiaries conduct business;
- 13.2. Company also reserves its right to assign the Employee training /deputation/ secondment/ transfer/ assignment to its subsidiaries, affiliates or associate companies, to its sub-contractors, and its Client's locations, and the Employee shall have no objection to the same;

14. Notices

All communications between the parties hereto shall be deemed to have been effectively served if addressed to the respective addressee, i.e., the Candidate, CU, HighRadius, respectively, at the address mentioned on the first page of this letter. Any change in the addresses shall be intimated to the other Party. Within a period of 7 (seven) days of such change and in the absence of such intimation, the addresses mentioned on the first page of this letter shall be deemed to be the addresses of the concerned Parties.

15. Successors and Assigns

This letter shall be binding on the successors and permitted assigns of HighRadius and shall insure to the benefit of and be enforceable by and against its successors and permitted assigns. This letter is personal in nature and the Candidate cannot assign this letter. The Candidate however agrees that HighRadius may assign all rights under the letter along with the sale of all or substantially all of the assets of the business, or merger, or a change of control.

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Name:
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16. Severability

If any one or more of the provisions of this letter shall be invalid, illegal, or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby. There shall be substituted for any such provision held invalid, illegal or unenforceable, a provision of similar import reflecting the original intent of the parties hereto to the extent permissible under law.

17. Dispute Resolution

Any dispute arising out of or in relation to this letter between the Candidate and HighRadius shall be resolved amicably between the parties hereto.

18. Governing Law and Jurisdiction

It is hereby agreed between the parties hereto that this letter shall be governed by, construed in accordance with and interpreted under and consistent with the laws of India without regard to the choice of law provisions thereof. Subject to article 16 above, in the event of any claim or liability arising out of the terms and conditions contained herein, the Courts at Hyderabad, Telangana shall have jurisdiction to the exclusion of all the other courts.

On behalf of the parties, signed in triplicate by

HighRadius Technologies Private Limited	Chandigarh University	Candidate
Signature:	Signature:	Signature:
Name:	Name:	Name: Hardik Chauhan
Date:	Date:	Date: 5/29/2022



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LAST SALARY BANK STATEMENT:

30-03-2023	UPI/345561922372/Oid202303302038/paytm-63322615@/Paytm Payments /PTM@192251141b5845ac51ca887e007	20.00	22.72
31-03-2023 CMS TRANSACTION	CMS/ 15469 BYSTIPEND/HIGHRADIUS TECHNOLOGIES PRIV	22,914.00	22,936.72
31-03-2023	UPI/309076364414/NA/Hardik Chouhan/Paytm Payments/PTM3ebabe5689194cc3b5fa5e358627dc18/	8,050.00	14,886.72
31-03-2023 MOBILE BANKING	MMT/IMPS/309021445865/Family/Vimlesh/SBIN0010558	1,000.00	13,886.72
Total:		22,959.00	9,564.05

NOC APPROVAL:

SELF UNDERTAKING

I, Hardik Chauhan, D/ S/O Mr. Rajeev Chauhan bearing UID No. 19BCS4325 PROGRAM B.E/B.tech BRANCH CSE(Mobile Computing) have received an offer on Placement from HighRadius Corp. (Name of the Company) and have likely to be joined 01/06/2022 (date of joining) hereby agree to undertake that:-

1. That I will submit my Attendance/ Salary slip/Bank Statement issued by the employer on account of proof on or before 10th of every month.
2. That I will communicate regularly with the assigned faculty **MR. VARUN LUTHRA** at official E-mail address **ibmcse.coordinator@cumail.in** during the Internship/Training.
3. That I will submit the monthly progress reports and other documents on time and according to the prescribed form and content.
4. That I further undertake all the responsibilities for undergoing this Internship/ project training at my cost.
5. That I will return all the reading books, material issued to me by the University before proceeding to Training.
6. That I shall abide by the rules and regulations issued from time to time by the University during the training.
7. That I will appear in the 7th/8th Semester final examination of the University on the specified dates as intimated by the Department.
8. That I will appear in the End Semester evaluation of the University on the specified dates intimated by the Department.
9. In case if He /She shifts to another company/Organization, He/She will again seek permission.



(Signature of the Student)

Declaration by the Parent/Guardian:

1. We, the undersigned parents/guardian shall ensure that our son/daughter uphold the good name of the University and abide by the code of conduct of the University, the Company, the industry and any other relevant rules and regulations at all times during the course of training/internship.
2. We, the undersigned parents/guardian shall ensure that our son/daughter shall not breach the terms and conditions of the contract for industrial training.



Signature of the Parent/Guardian

Note: a. *The University reserves the right to withhold the degree OR cancellation of the semester, for the non-fulfillment of above mentioned conditions.*
b. *In any case, if the student drops his Internship/Training, he/she will report back to his respective Department.*
c. *The Undertaking will be retained by the Department in original.*

DEPARTMENT/ INSTITUTE CERTIFICATE

The Department of APEX Institute of Technology (AIT) hereby permits the above said student to carry out their job work at HighRadius. Mr. Aman Kaushik is identified as the (Name of the In-Charge) staff member to coordinate with HighRadius (Name of the Company) for the project work on academic matters.



Approved.
[Signature]

Hand Signature of HOD Apex Institute of Technology Chandigarh University, Gharau Mohali, Punjab	Signature of Placement Coordinator	Signature of Principal/Director
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— Date:

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1. Introduction:

The organisation in which we are currently working as an intern is the **HIGHRADIUS** Corporation founded in 2006 co-founded by **Mr. Sashi Narahari** and brings a unique combination of business management expertise and technical knowledge to his leadership of the HighRadius team and corporate strategy. Sashi co-founded HighRadius and brings a unique combination of business management expertise and technical knowledge to his leadership of the HighRadius team and corporate strategy.

This focus on business process improvement is the driving philosophy behind HighRadius' offerings and results in our customers achieving peak financial performance through improvements such as reduced Days Sales Outstanding (DSO), greater operational efficiency, and increased deduction recovery. He has worked with many Fortune 1000 companies in implementing credit management, collections management, dispute management, and invoicing and payments solutions. Prior to HighRadius, Sashi served as the CEO of Riversand Technologies, a provider of Master Data Management (MDM) solutions. Sashi holds a Master's Degree in Mechanical Engineering from the University of Maryland, College Park, and a Bachelor's Degree in Mechanical Engineering from Indian Institute of Technology (IIT) Madras.

HighRadius is a Fintech enterprise Software-as-a-Service (SaaS) company that leverages Artificial Intelligence-based Autonomous Systems to help companies automate Accounts Receivable and Treasury processes. HighRadius is an Integrated Receivables platform reduces cycle times in your order-to-cash process by automating receivables and payments processes across credit, electronic billing and payment processing, cash application, deductions, and collections.

HighRadius Credit Software automates the credit management process, enabling credit managers to make highly-accurate credit decisions 2X faster and enable faster customer onboarding with 4 primary components: configurable online credit application, customizable credit scoring engines, credit agency data aggregation engine, and collaborative credit management workflow. Along with that, there are a lot of key features

that should definitely be explored some of which are online credit application, credit information aggregation, automated credit scoring & risk assessment, credit management workflows, approval workflows, and automated bank & trade reference checks. The result is faster customer onboarding, better internal collaboration, higher customer satisfaction, more targeted periodic reviews, and lower credit risk across the company's customer portfolio. It headquarters is in Houston, USA.

Autonomous Software is data-driven software that continuously morphs its behaviour to the ever-changing underlying domain transactional data. It brings modern digital transformation capabilities like Artificial Intelligence, Robotic Process Automation, Natural Language Processing and Connected Workspaces as out-of-the-box features for the finance & accounting domain. Finance business stakeholders have been led to believe that they have only two choices: pick an application software vendor that digitizes a paper or Excel-based process to an electronic system of record, or, choose a middleware platform for AI or RPA to build and maintain in-house, domain-specific capabilities. In contrast, HighRadius Autonomous Software combines the best of both worlds to deliver measurable business outcomes such as DSO reduction, working capital optimization, bad-debt reduction, reduce month close timelines and improve productivity in under six months.

HighRadius Treasury Management Applications assist teams to achieve touch-less cash management and accurate cash forecasting. HighRadius is powered by the Rivanna Artificial Intelligence Engine purpose-built for finance and the Freedom Digital Assistant, and it allows teams to leverage machine learning for predicting future outcomes and automating routine, labour-intensive tasks. The complexity of business environments constantly grows, both with regard to the amount of data relevant for making strategic decisions and the complexity of included business processes. Today's dynamic and competitive markets often imply rapid and accurate decision making. Relevant data are stored across a variety of data repositories, possibly using different data models and formats, and potentially crossed with numerous external sources for various context aware analysis. A data integration process combines data residing on different sources and provides unified view of this data for a user.

HighRadius solutions deliver an increased operational efficiency through automation, accurate cash flow forecasting, optimized cash management, lower days sales outstanding, and bad debt, to help companies achieve strong ROI. Its products provide value to a wide range of customers and are especially relevant to industries like consumer products, manufacturing, distribution, energy, and others that sell products or provide a service to other businesses.

Executives & Designation:

Name	Designation
Mr. Sashi Narahari	President/CEO
Mr. Urvish Vashi	CMO
Mr. Shayne Higdon	General Manager
Mr. Pankaj Jagtap	Global VP of Professional Services
Mr. Bhanu Bobba	Managing Director

Key Highlights of HighRadius:

- HighRadius estimated annual revenue is currently \$388.2M per year.
- HighRadius AI-powered platform surpassed \$2.23 trillion in annual receivables processed
- Grew to over 2500 HighRadians across six office locations across the US, EMEA, and Asia
- Registered 47% YoY growth in Annual Recurring Revenue
- Exceeded 600 customers, including over 200 from Forbes Global 2000
- HighRadius estimated revenue per employee is \$105,800
- HighRadius total funding is \$475M.

Customer & Revenue Growth

- Despite a challenging 2020, HighRadius registered a 47% growth in Contracted ARR (Annual Recurring Revenue) compared to the previous year.
- As of today, HighRadius has grown to 600 customers, including over 200 customers from Forbes Global 2000.

- 2020 saw the Annual Receivables Processed by the HighRadius AI-powered Integrated Receivables Platform exceed \$2.23 Trillion. This is the equivalent of the GDP of France, and the transaction volume grew by 74% compared to the prior year.

Product & Technology Leadership

- Received numerous awards and recognition, including being named to Forbes Cloud 100 and the CB Insights Fintech 250
- The IDC MarketScape for Accounts Receivable Software (Enterprise and Mid-Market editions) identified HighRadius as a Leader, the second time in a row.
- Significant product expansion led by the launch of the RadiusOne and HighRadius AI-powered Cash Forecasting for Enterprise Treasury Management.

Key Services provided:

- Reduce DSO and bad debt with the best Accounts Receivable Management Software. Connect credit, billing & invoicing, cash application, deductions, and collections into a single business process. Build a high-performance culture for your O2C teams.
- Eliminate order to cash process silos to make data-driven decisions with AI-enabled accounts receivable solution.
- For instance, Collectors having real-time visibility into customer's risk class can prioritize at-risk customers to contact.
- One of the cores/major accounts receivable software features is the automation of clerical tasks including cash application, backup document aggregation.

Internship Selection Process:

In December 23rd 2021 the company conducted an orientation program on Winter Internship program in a virtual mode. After that on Jan 4th 2022, they had conducted an online test for the students based on the tracks they have choose. The students who had chosen the tech track are test on the Quants, Logical, Programming and Coding. Based on this the company selected the interns for the Winter Internship. The starting date for the Internship is 27-Jan 2022. The tenure for the Internship is 11 weeks. In these 3 months we had undergone training by the company on technical skills like Python, Machine Learning, Java, HTML, CSS and ReactJS with some weekly Quizzes and monthly Projects. At the end of the Internship training as a Final Project we are responsible to build an AI Enabled Fintech B2B Invoice Management Application using the skills that we have learnt during the Internship. The end date for the Internship is 15-Apr 2022.

Post completion of the internship. We have gone through a interview regarding project. Based on the performance of the training and interview I have got selected for 1 year paid internship for the role “**R2R-MACHNE LEARNING**”.

2. Detailed Introduction to your job profile:

During the first 3 weeks (Week-1 to Week-3) of the Internship we were trained on the **Core-Machine Learning**. For the next 3 weeks (Week-4 to Week-6) domain specific training was given . At the end of the July we were assigned with the pod leads. In the starting of the august we were told to install the required packages and libraries required for our domain work. There were several facilitation techniques used by the trainer which included question and answer, brainstorming, case study discussions and practical implementation of some of the topics by trainees on flip charts and paper sheets by giving assignments.

The multitude of training methodologies was utilized in order to make sure all the participants get the whole concepts and they practice what they learn, because only listening to the trainers can be forgotten, but what the trainees do by themselves they will never forget. After the post-tests were administered and the final course evaluation forms were filled in by the participants, the trainer expressed his closing remarks and reiterated the importance of the training for the trainees in their daily activities and their readiness for applying the learnt concepts in their assigned tasks.

From Date	To Date	Trained Core Skill
09-06-2022	20-06-2022	Core-Machine Learning
21-06-2022	30-06-2022	PDP
31-06-2022	11-07-2022	Deployment
12-07-2022	16-07-2022	DS
28-03-2022	13-04-2022	Web APP Project Work

Internship Training Timeline:

What the Training is about!

Machine Learning is the science of getting computers to learn without being explicitly programmed. It is closely related to computational statistics, which focuses on making prediction using computer. In its application across business problems, machine learning

is also referred as predictive analysis. Machine Learning is closely related to computational statistics. Machine Learning focuses on the development of computer programs that can access data and use it to learn themselves. The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide. The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

Key Job Activities:

- View the invoice data from various buyers.
- See various fields/attributes of the invoice(s) from a particular buyer.
- Perform Data Pre-processing on the invoice data.
- Get account-level analytics to easily visualize and interpret data- EDA and Feature Engineering.
- Get a prediction of when the invoice is going to get paid.

Internship Timeline:

Date	Topic	No. of Hours
09-06-2022	Ability to perform data analysis using some basic tools of Excel	4.5 hours
10-06-2022	SQL	4 hrs
13-06-2022	Python Fundamentals	6 hrs
14-06-2022	NumPy +Pandas	8.5hrs
15-06-2022	EDA	9 hrs
16-06-2022	Feature Scaling	8 hrs
17-06-2022 – 20-06-2022	Tunning	17 hrs

Date	Topic	No. of Hours
21-06-2022 – 23-06-2022	PDP Workflow	14 hrs
24-06-2022	Data pre-process and EDA	3 hrs
27-06-2022 – 28-06-2022	Feature Engineering and Modelling	6 hrs
29-06-2022	SQL	4 hrs
30-06-2022	PYCHARM setup	2 hrs
30-06-2022 - 11-07-2022	Deployment+F2F interview	-
12-07-2022	DS workflow	6 hrs
13-07-2022	EDA	2.5 hrs

14-07-2022	Feature engineering	2.5 hrs
15-07-2022	Modelling	3.5 hrs
16-07-2022	PYCHARM setup	3 hrs

Detailed job description:

The B2B world operates differently from the B2C or C2C world. Businesses work with other businesses on credit. When a buyer business orders goods from the seller business, the seller business issues an invoice for the same. This invoice for the goods contains various information like the details of the goods purchased and when it should be paid. As a winter internship project, we will be building a web application to help the people working in the Accounts Receivable departments in their day-to-day activities.

Accounts Receivable represents money owed by entities to the firm on the sale of products or services on credit. In most business entities, accounts receivable is typically executed by generating an invoice and either mailing or electronically delivering it to the customer, who, in turn, must pay it within an established timeframe, called credit terms or payment terms. We need to build a web application where the users in the Account Receivable department can:

- In the ideal world, the buyer business should pay back within the stipulated time (Payment Term). However, in the real world, the buyer business seldom pays within their established time frame, and this is where the Account Receivables Department comes into the picture.
- Every business consists of a dedicated Account receivables Department to

- collect and track payment of invoices.
- It consists of an Account receivables team that is responsible for:
 - Collecting payments from customers for their past due to invoices.
 - Sending reminders and follow-ups to the customers for payments to be made.
 - Looking after the entire process of getting the cash inflow.
 - Help the company get paid for the services and products supplied.

Seller business interacts with various businesses and sells goods to all of them at various times. Hence, the seller business needs to keep track of the total amount it owes from all the buyers. This involves keeping track of all invoices from all the buyers. Each invoice will have various important fields like a payment due date, invoice date, invoice amount, baseline date etc.

Key Learning from Internship

The Academic experience I have helped me a lot in achieving the internship. During the internship we need to maintain 85% attendance this is really a big task but as a part of my academic I have learnt to maintain good attendance. The consistence, preciseness that I learnt during my academics are helping me in the internship.

Open communication was one of the strongest and most apparent skills that I learned during my soft skills session in my academics helped me while interacting with the mentors and clarifying my doubts during the internship. Skills such as multitasking, communicating, and dealing with deadlines are the things that I have learnt during my Academics this totally helped me in submitting my works on time. The basic Coding skills I learnt during my academics really helping me a lot while dealing with real time projects.

As my internship draws to a close and I reflect back on all I have learned, I realize what an excellent experience this has been. I gathered much knowledge in the classroom, but a hands-on approach has been invaluable. It will be served as a beneficial ending to my formal education. In my opinion, the best way to learn is by doing. I am truly grateful for this opportunity.

This training by High Radius has introduced us to Machine Learning. Now, we know that Machine Learning is a technique of training machines to perform the activities a human brain can do, albeit bit faster and better than an average human-being. Today we have seen that the machines can beat human champions in games such as Chess, Mah-jong, which are considered very complex. We have seen that machines can be trained to perform human activities in several areas and can aid humans in living better lives. Machine learning is quickly growing field in computer science. It has applications in nearly every other field of study and is already being implemented commercially because machine learning can solve problems too difficult or time consuming for humans to solve. To describe machine learning in general terms, a variety models are used to learn patterns in data and make accurate predictions based on the patterns it observes.

Machine Learning can be a Supervised or Unsupervised. If we have a lesser amount of data and clearly labelled data for training, we opt for Supervised Learning. Unsupervised Learning would generally give better performance and results for large data sets. If we have a huge data set easily available, we go for deep learning techniques. We also have learned Reinforcement Learning and Deep Reinforcement Learning. We now know what Neural Networks are, their applications and limitations. Specifically, we have developed a thought process for approaching problems that machine learning works so well at solving. We have learnt how machine learning is different than descriptive statistics.

Finally, when it comes to the development of machine learning models of our own, we looked at the choices of various development languages, IDEs and Platforms. Next thing that we need to do is start learning and practicing each machine learning technique. The subject is vast, it means that there is width, but if we consider the depth, each topic can be learned in a few hours. Each topic is independent of each other. We need to take into consideration one topic at a time, learn it, practice it and implement the algorithm/s in it using a language choice of yours. This is the best way to start studying Machine Learning. Practicing one topic at a time, very soon we can acquire the width that is eventually required of a Machine Learning expert.

As I was having basic knowledge on all core subjects that I have learned during my academics really helped me in the assessments and quizzes that held during the internship. While I believe that the Department of Career planning internship requirement is a very useful tool in preparing college students for life after graduation. I always allowed myself to remain in my personal comfort zone but during my academics I started show casing myself that helped me during the internship. As invaluable as this experience has been, looking back, I cannot say that there would be nothing I would change.

I have learned so much about the responsibilities of life outside of the classroom. When an intern works for a company, they just don't get in-depth knowledge and experience in their specific field but also, they learn how to work with others in a team, collaboration with other members, time management, communication, punctuality, leadership, how to meet deadlines, how to work under pressure, how to make decisions and also, they develop better work habits and they learn real-world business skills. Internships help students to build confidence and they learn to adapt company culture. It also helps you learn and gain so much experience that you would not have had without being in the work force instead of the classroom. More than anything, though, I have during my internship the value of hard work and how to work as a team with other people. Everyone must do their part and work as a team to meet monthly and yearly goals. Just being able to see how a business works and what really goes on beyond what you see on the surface has been an experience I can take with me. Having this internship will become a great lesson in how to cope with real problems and situations. I now feel more prepared to obtain my goals and have the career I have always wanted.

As I was having basic knowledge on all core subjects that I have learned during my academics really helped me in the assessments and quizzes that held during the internship.

PYTHON:

Python is a computer programming language created in 1989 by a person named Guido Van Rousom. After its creation there have been a few important releases such as Python 1.0 in 1994, Python 2.0 in 2000, and Python 3.0 in 2008. In the HighRadius System we use the 3.6 and 3.7 versions.

Python is a Multi-Purpose programming language. It is used for developing GUI (Graphical User Interfaces), various scripting purposes, creating backend applications, web scraping and various other things. It is an Interpreted Language, that is, it is executed in a sequential manner and does not need to be compiled before it is executed. It is a strongly and dynamically typed programming language which is extendable and portable. It can be used to combine various programming languages together to work cohesively as

one distinct entity. In addition to that, Python is also a free and open source programming language which means that it is free to use and everyone can contribute to its development.

The reason why Python is such a popular programming language is because it is a high level programming language which is simple to learn. It has the support of various packages such as Pandas, Numpy, Scikit-Learn and many more. They can be harnessed to many tasks such as numerical manipulations, visualization tools and even various machine learning algorithms. It is widely used in various industries for its powerful and multifaceted features.

Python Programming Constructs:

Constructs control the flow of the program. If we dive deep into the types of constructs, they are primarily of three types : Sequence, Selection and Repetition.

A Sequence is an order in which the code will get executed. Selection is the part where it is decided which block of code will get executed based on some conditions. Repetition is the construct that decides which part of the code will get executed multiple times based on specific criteria.

Conditional Statements [Selection]

Branching in Python can be achieved through the following keywords: if, elif (else-if) and else. The scope of the statement block is decided through indentation (cascading in case of nested conditions).

Iterative Statements [Repetition]

- Iterative constructs in python are achieved through loops. They are primarily of two types: for loop and while loop.

- The conditions in which the loops will continue to execute or stop after a specific number of iterations are controlled through two keywords, i.e., continue and break.
- Continue statement is used to tell python to skip the rest of the statements in a current loop construct and continue with the next iteration of the code block.
- Break, on the other hand, is used to completely break out of the loop.

There are many ways to store data in python. They are in the form of various data structures. For example, lists, tuples, dictionaries, sets, and many more.

List

List is one of the simplest and most important data structures in python. They are defined by enclosing square brackets “[]” and each item is separated by a “,”. Lists can be defined as a collection of items where each item has an assigned positional value (index value) starting from 0 (zero). It is mutable, i.e., its contents can be changed. It is similar to an array with some basic differences. For example, lists can store heterogeneous data types together under one name unlike matrices(arrays) that contain homogeneous data.

There are many methods that can be used to manipulate lists and do various operations. They are listed in the image below with their corresponding uses.

Tuple

A Tuple can be defined as an immutable list. It cannot be altered. It is defined by initializing elements in between parentheses “()”. Once a tuple has been created, you cannot add or alter elements in the tuple. It has only two methods: count () and index (). Count gives the frequency of a searched element while index provides the location of the searched element in the tuple (index starts with 0).

The benefit of using tuples is that they are faster than lists. It protects the data against any accidental changes to sensitive data if the user knows that the data will not need to be changed in the future. The main advantage of tuples is that it can be used as key values in dictionaries while lists cannot.

Sets

A set contains an unordered collection of unique and immutable objects. All kinds of operations that are applicable to a set can be used for sets.

Dictionary

It is a python data structure that is used to store data in key-value pairs. They are a set of attributes that have corresponding values. It is an unordered, indexed, and changeable form of data that is written within curly braces.

One can perform various actions on a dictionary. For instance, printing all the keys of the dictionary, all the values in the dictionary, adding a new element into the dictionary and also removing a key-value pair from the dictionary.

Strings

Strings can be defined as a list or an ordered chain of characters. We can perform various operations or manipulations on these strings.

Itertools

Python's Itertool is a module that provides various functions that work on iterators to produce complex iterators. This module works as a fast, memory-efficient tool that is used either by itself or in combination to form complex algebraic equations.

Slicing Function

The Python slice() function allows us to slice a sequence. It means we can retrieve a part of a string, tuple, list, etc. We can specify the start, end, and step of the slice. The step lets you skip items in the sequence.

The Syntax of slice() is:

```
slice(start, stop, step)
```

slice() Parameters:

slice() can take three parameters:

start (optional) - Starting integer where the slicing of the object starts. Default to None if not provided.

stop - Integer until which the slicing takes place. The slicing stops at index stop -1 (last element).

step (optional) - Integer value which determines the increment between each index for slicing. Defaults to None if not provided.

Return Type: Returns a sliced object containing elements in the given range only.

Functions

A function is a construct that is defined by the keyword “def”. The general syntax looks like this:

```
def function_name(Parameter List):
    #Statements, i.e, the function body
    return statement (if required)
```

Lambda Function

We use lambda functions when we require a nameless function for a short period of time. In Python, we generally use it as an argument to a higher-order function (a function that takes in other functions as arguments). Lambda functions are used along with built-in functions like filter(), map() etc.

With filter():

The filter() function in Python takes in a function and a list as arguments. The function is called with all the items in the list and a new list is returned which contains items for which the function evaluates to True.

With map():

The map() function in Python takes in a function and a list. The function is called with all the items in the list and a new list is returned which contains items returned by that function for each item.

Classes and Objects:

A class is a user-defined blueprint or prototype from which objects are created. Classes provide a means of bundling data and functionality together. Creating a new class creates a new type of object, allowing new objects of that type to be made. Each class instance can have attributes attached to it for maintaining its state. Class instances can also have methods (defined by their class) for modifying or manipulating their state.

An object consists of :

State: It is represented by the attributes of an object. It also reflects the properties of an object.

Behavior: It is represented by the methods of an object. It also reflects the response of an object to other objects.

Identity: It gives a unique name to an object and enables one object to interact with other objects.

In the below example, the Car is a class and BMW is an object of that class. The class Car has various attributes such as attr1 that contains the engine type and attr2 that contains the HorsePower of the car. We can use these attributes and the start function as they are used to manipulate the state of the object. The self keyword is used to refer to the object that is calling a particular class method.

__init__ method

It is used to initialize the attributes for a class with specific values for a particular object. It is executed at the time of object creation for a particular class.

MySQL:

When you have some data, and you want to store this data somewhere. This data could be anything. It could be about customers, products, employees, orders, ...etc. This data could be in text format, numeric, dates, document files, images, audio, or video.

The screenshot shows a Microsoft Excel spreadsheet titled "Copy of Employee List.xlsx - Microsoft Excel". The table has a header row and 22 data rows. The columns are labeled A through I. The data includes employee names, SSNs, hire dates, departments, store numbers, hourly rates, and gross pay.

	A	B	C	D	E	F	G	H	I	J	K
1	Employee List										
3	First	Last	SSN	Date of Hire	Dept.	Store #	Hourly Rate Hrs.	Gross Pay			
4	Theresa	Abel	168-91-3167	10/5/1999	Accounting	60613	\$ 18.14	40.00	\$ 725.49		
5	Lori	Miller	247-08-1243	8/25/2005	Cashier	60159	\$ 11.39	28.50	\$ 324.65		
6	Henry	Richardson	153-33-8555	11/6/2005	Sales Associate	60614	\$ 13.89	34.25	\$ 475.88		
7	Melanie	Halal	161-54-8034	9/8/2005	Sales Associate	60159	\$ 13.58	18.25	\$ 247.81		
8	Harley	Paterson	437-82-1927	10/16/2002	Cashier	60613	\$ 11.05	24.50	\$ 270.81		
9	Teri	Rapp	177-91-6128	11/20/2005	Accounting	60714	\$ 19.98	40.00	\$ 799.16		
10	James	Connors	419-19-5463	5/17/2002	Purchasing	60614	\$ 20.10	40.00	\$ 804.19		
11	Jennifer	Owens	283-29-6541	9/17/2004	Sales Associate	60540	\$ 12.94	35.50	\$ 459.32		
12	Antonio	McDonald	336-49-0303	6/27/2005	Livestock Mgt.	60613	\$ 21.68	27.25	\$ 590.67		
13	Todd	Booth	165-89-1835	12/4/2001	Sales Associate	60614	\$ 10.07	15.25	\$ 153.56		
14	Jane	Simpson	381-43-3894	7/6/2001	Customer Service	60540	\$ 12.06	19.50	\$ 235.12		
15	Colleen	Stark	180-66-2794	8/27/2001	Accounting	60626	\$ 19.35	40.00	\$ 773.83		
16	Amanda	Lewis	164-86-4378	11/1/2004	Cashier	60626	\$ 11.20	39.75	\$ 445.03		
17	Karina	Drake	411-62-6873	10/24/2003	Sales Associate	60626	\$ 8.34	44.75	\$ 373.00		
18	Harry	Chen	441-95-2099	6/20/1999	Accounting	60714	\$ 19.96	40.00	\$ 798.35		
19	Bob	Reed	295-45-3080	7/9/2004	Cashier	60540	\$ 12.07	15.50	\$ 187.02		
20	Kathy	Howard	415-07-5465	9/3/2002	Marketing	60613	\$ 22.69	40.00	\$ 907.69		
21	Dominick	Hill	209-67-5723	1/21/2000	Sales Associate	60714	\$ 13.47	12.50	\$ 168.43		
22	Erin	Rose	183-56-2052	4/14/2003	Livestock Mgt.	60540	\$ 20.78	45.00	\$ 935.04		

Probably this is what comes into your mind when you hear the term “database”. Now, we have a kind of data, and you stored them in spreadsheets in a way that satisfies your need. That might be OK, because just having data is not a good enough reason to need a database, and it’s not the problem. The problem is what comes next, and there’s a lot of potential problems.

What if you have a bunch of data, maybe 10,000 customers, “Are you going to scroll down in the spreadsheet to get the 9999 customers?!”, What if the security was a concern, “Do you care about if someone else got access to your data?”, What if you accidentally put redundant information, “Is it fine to have duplicate information along with the spreadsheet?”.

This takes us to the next question, “When do we actually need a database?”. Consider the following potential problems:

Size

You may have thousands or millions of rows of customers, or any piece of information.

Accuracy

“Do you care if someone entered incorrect data?”. If yes, nothing could actually prevent me from typing incorrect data into a spreadsheet.

Security

If the data is sensitive, and you need to restrict access to the data; It doesn't need to be shared with everyone. In addition, “Do you need to know who made every change at every point?”.

Redundancy

If the redundant data (having multiple copies of the same data) will lead to conflict, you would need to have only non-repeated unique data.

Importance

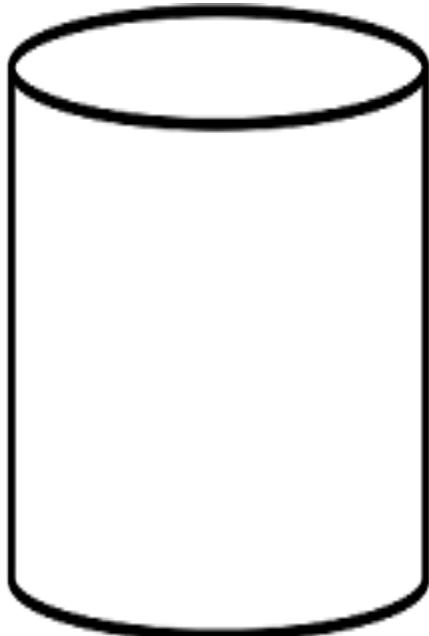
“What if you had a disconnect or a crash, and you lost your data?”. You've probably felt that pain before. And it's unacceptable to lose important data like orders of a customer, allergies of a patient, flight bookings, ...etc.

Overwriting

How about having more than one person overwriting the same data at the same time. How about 10 at the same time or 100 people at the same time?. You'll end up with everybody overwriting everybody else's changes.

If you are saying “Yes” to one of these problems, or all of them and more besides, to keep the data reliable, secured, and maintainable. So, you need to have a database. That’s what we are going to discuss here.

What’s A Database?



database

Probably this is what comes into your mind when you hear the term “database”.

It’s a structured system to put your data in that imposes rules upon that data, and the rules are yours because the importance of these problems changes based on your needs. Maybe your problem is the size, while someone else has a smaller amount of data where the sensitivity is a high concern.

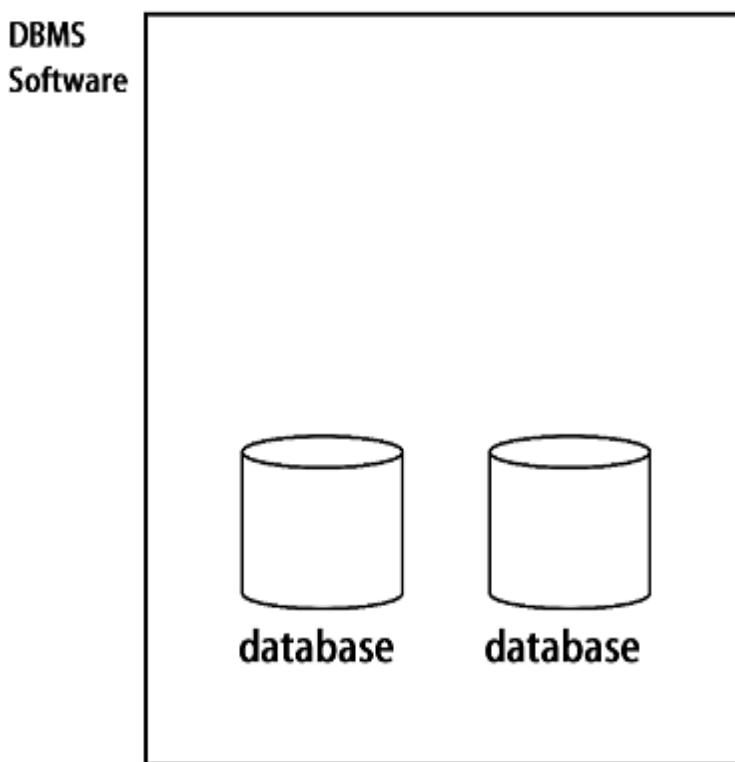
It’s the things you can’t see that is going on in the background; the security, the enforced integrity of the data, the ability to get to it fast and get to it reliably, the robustness; serving lots of people at the same time and even correctly survive crashes and hardware issues without corrupting the data.

And that’s what we need to do here; understand how to describe our structure and define those rules, so all these invisible things will actually happen.

Database Management System (DBMS)

We often mistakenly say our database is Oracle, MySQL, SQL Server, MongoDB. But, they aren't databases, they are database management systems (DBMS). The DBMS is the software that would be installed on your personal computer or on a server, then you would use it to manage one or more databases.

The database has your actual data and the rules about that data, while the DBMS is the program that surrounds and manages your actual data, and it enforces the rules you specified on your data. The rules for example could be the type of the data, like integer or string, or the relationship between them.



Database Management System (DBMS)

In practice, it's very common to have multiple databases. The database that deals with your order and customer information might be completely independent of your database that deals with human resource information. And in many organizations, you don't just have multiple databases but multiple DBMS. Sometimes it's because one DBMS is better at something than the other.

There are different DBMS, and they are categorized under:

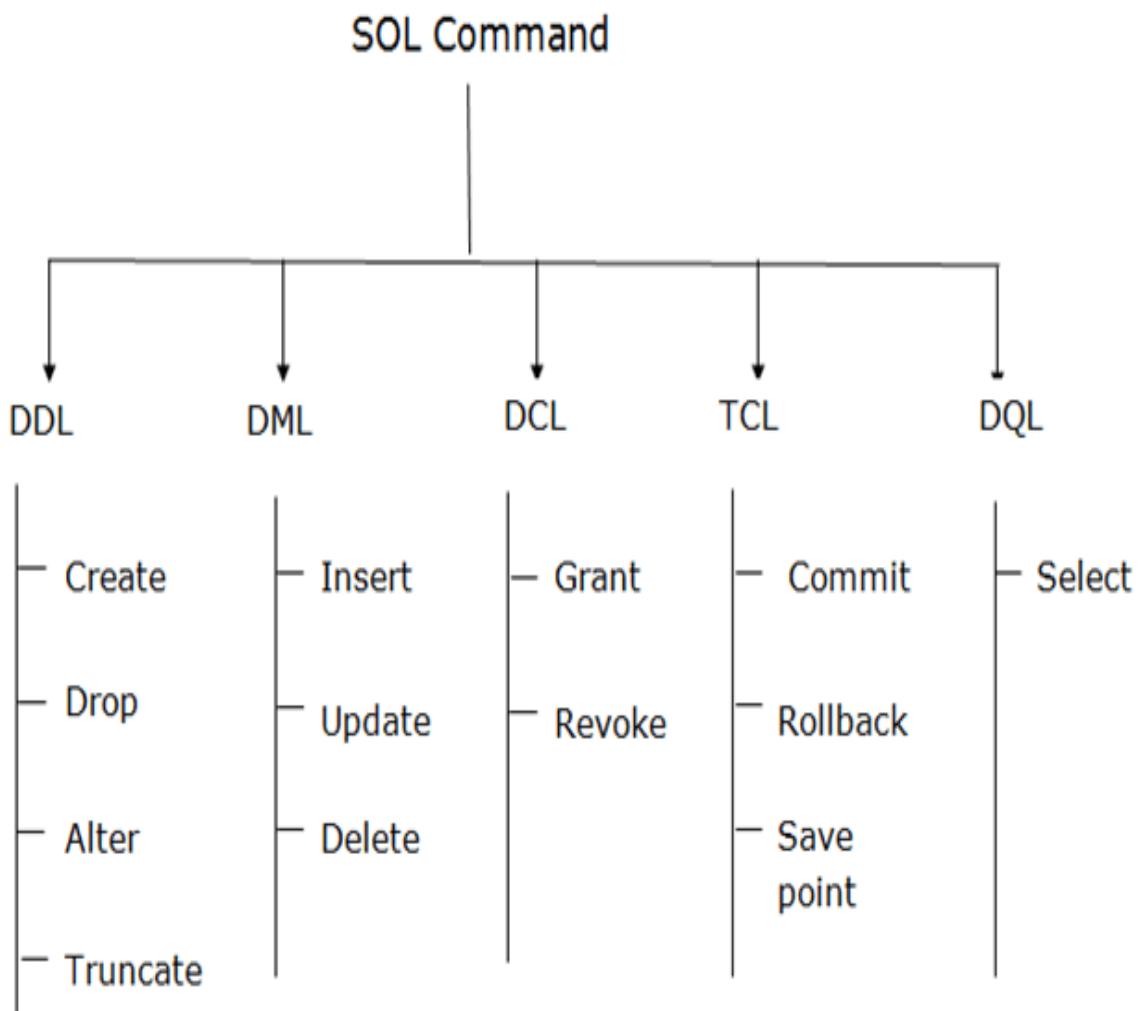
- Relational Database Management Systems
- Hierarchical Database Systems
- Network Database Systems
- Object-Oriented Database Systems
- NoSQL Database Systems

SQL Commands

- SQL commands are instructions. It is used to communicate with the database. It is also used to perform specific tasks, functions, and queries of data.
- SQL can perform various tasks like create a table, add data to tables, drop the table, modify the table, set permission for users.

Types of SQL Commands

There are five types of SQL commands: DDL, DML, DCL, TCL, and DQL.



1. Data Definition Language (DDL)

- DDL changes the structure of the table like creating a table, deleting a table, altering a table, etc.
- All the command of DDL are auto-committed that means it permanently save all the changes in the database.

Here are some commands that come under DDL:

- CREATE
- ALTER

- DROP
 - TRUNCATE
- a. **CREATE** It is used to create a new table in the database.

Syntax:

1. CREATE TABLE TABLE_NAME (COLUMN_NAME DATATYPES[,...]);

Example:

1. CREATE TABLE EMPLOYEE(Name VARCHAR2(20), Email VARCHAR2(100), DOB DATE);

b. **DROP:** It is used to delete both the structure and record stored in the table.

Syntax

1. DROP TABLE table_name;

Example

1. DROP TABLE EMPLOYEE;

c. **ALTER:** It is used to alter the structure of the database. This change could be either to modify the characteristics of an existing attribute or probably to add a new attribute.

Syntax:

To add a new column in the table

1. ALTER TABLE table_name ADD column_name COLUMN-definition;

To modify existing column in the table:

1. ALTER TABLE table_name MODIFY(column_definitions...);

EXAMPLE

1. ALTER TABLE STU_DETAILS ADD(ADDRESS VARCHAR2(20));
2. ALTER TABLE STU_DETAILS MODIFY (NAME VARCHAR2(20));

d. TRUNCATE: It is used to delete all the rows from the table and free the space containing the table.

Syntax:

1. TRUNCATE TABLE table_name;

Example:

1. TRUNCATE TABLE EMPLOYEE;

2. Data Manipulation Language

- o DML commands are used to modify the database. It is responsible for all form of changes in the database.
- o The command of DML is not auto-committed that means it can't permanently save all the changes in the database. They can be rollback.

Here are some commands that come under DML:

- o INSERT
- o UPDATE
- o DELETE

- a. **INSERT:** The INSERT statement is a SQL query. It is used to insert data into the row of a table.

Syntax:

1. INSERT INTO TABLE_NAME
2. (col1, col2, col3,... col N)
3. VALUES (value1, value2, value3,.... valueN);

Or

1. INSERT INTO TABLE_NAME
2. VALUES (value1, value2, value3,.... valueN);

For example:

1. INSERT INTO javatpoint (Author, Subject) VALUES ("Sonoo", "DBMS");
- b. **UPDATE:** This command is used to update or modify the value of a column in the table.

Syntax:

1. UPDATE table_name SET [column_name1 = value1,...column_nameN = valueN] [
WHERE CONDITION]

For example:

1. UPDATE students
2. SET User_Name = 'Sonoo'
3. WHERE Student_Id = '3'

- c. **DELETE:** It is used to remove one or more row from a table.

Syntax:

1. DELETE FROM table_name [WHERE condition];

For example:

1. DELETE FROM javatpoint
2. WHERE Author="Sonoo";

3. Data Control Language

DCL commands are used to grant and take back authority from any database user.

Here are some commands that come under DCL:

- o Grant
- o Revoke

- a. **Grant:** It is used to give user access privileges to a database.

Example

1. GRANT SELECT, UPDATE ON MY_TABLE TO SOME_USER, ANOTHER_USER;

- b. **Revoke:** It is used to take back permissions from the user.

Example

1. REVOKE SELECT, UPDATE ON MY_TABLE FROM USER1, USER2;

4. Transaction Control Language

TCL commands can only use with DML commands like INSERT, DELETE and UPDATE only.

These operations are automatically committed in the database that's why they cannot be used while creating tables or dropping them.

Here are some commands that come under TCL:

- o COMMIT
- o ROLLBACK
- o SAVEPOINT

- a. **Commit:** Commit command is used to save all the transactions to the database.

Syntax:

1. COMMIT;

Example:

1. DELETE FROM CUSTOMERS
2. WHERE AGE = 25;
3. COMMIT;

- b. Rollback:** Rollback command is used to undo transactions that have not already been saved to the database.

Syntax:

1. ROLLBACK;

Example:

1. DELETE FROM CUSTOMERS
2. WHERE AGE = 25;
3. ROLLBACK;

- c. SAVEPOINT:** It is used to roll the transaction back to a certain point without rolling back the entire transaction.

Syntax:

1. SAVEPOINT SAVEPOINT_NAME;

4. Data Query Language

DQL is used to fetch the data from the database.

It uses only one command:

- o SELECT

- a. SELECT:** This is the same as the projection operation of relational algebra. It is used to select the attribute based on the condition described by WHERE clause.

Syntax:

1. SELECT expressions
2. FROM TABLES
3. WHERE conditions;

For example:

1. SELECT emp_name
2. FROM employee

3. WHERE age > 20;

What is PDP:

PDP: Payment Date Prediction

Problem Statement

The objective Payment date prediction use case is to predict the payment date at an invoice level for all customers of an account and help the collections team become proactive through improved dunning strategies. We achieve it through capturing the trends and patterns from the historical data.

Requirements of Use-Case

Below are the major aspects of the use case that needs to be developed.

1. Dataset:

- A dataset will be provided which must be parsed and processed before analysis.
- Check and correct the data type of columns if necessary. All date columns must be in the 'YYYY-mm-dd' format.
- Perform data sanity on the entire dataset.
- Check the percentages of missing values and do null imputation.
- Correct or drop the data containing discrepancy.
- Ideally, in no case, the data which is being dropped should cross 10% of the entire data.
- Mega_date should be calculated according to the formula present in the reference notebook.

2. Data Splitting:

In our PDP use case after data splitting(using time-based splitting) the data sets that we have are:-

1. History Data- The History Data is used to create the Customer Level Features. This data is used to capture the general trends and patterns of the different customers. It should be around 20% ~ 40% of the total data.
2. Training Data- This Data is used to create the Invoice Level Features. The Customer Level Features which are created from the History Data, are mapped on this data. This data is used to train/fit our ML model. The timeline should start just after the History Data and should extend leaving out the last 2 months of your data.
3. Validation Data- This Data is used to validate/fine-tune the hyperparameters of the model that we have trained using the Training Data. Here also, the customer level features are mapped and Invoice Level Features are made. Usually, the 2nd last month considering the timeline of your whole data.
4. Test Data- This Data is used for testing the model performance using the use of case-specific metrics(we will learn about this later). Here also the Customer Level Features are mapped and the Invoice Level Features are calculated. Last month, consider the timeline of your whole data.

3. EDA(Exploratory Data Analysis):

- Analyze delay patterns, customer behavior, and invoice behavior. Pattern analysis can be done on various columns that can be used in feature creation.
- Mega Date vs Delay: To check the overall delay pattern according to the invoice creation date. This graph helps in visualizing the entire delay pattern(train, validation, test) at a glance.

- The EDA performed should preferably be on a customer level or at an invoice level and anomalies or a sudden change in invoice clearing rate or invoice generation rate trend should be noted if any.
- Check for invoice behavior that affects the delay pattern(delayed invoice and non-delayed invoices analysis for a set time frame, etc)
- Delay patterns related to payment terms.
- You can look into:
 - The difference in delay patterns according to each company's code
 - The no. of invoices being generated or cleared according to time (monthly, weekly, daily).

Note: Do not limit yourself to the above and explore the more possible patterns that can help you analyze the delay pattern of your account.

4. Customer Segregation:

From all the customers that we have in our data, we separate them into Important and Non Important Customers on basis of their contribution to two things:-

Invoice Contribution:-

The first metric based on which we take a customer as Important is its Invoice count, i.e the more the number of invoices of a customer the higher the chance that it will be an Important Customer.

So we provide a threshold invoice count and calculate the Invoice Contribution of the customers who have the invoice count \geq invoice count threshold and then select a threshold invoice count so that the minimum invoice contribution comes greater than 80%.

Amount Contribution:-

The second factor taken into consideration is the Amount Contribution of the customer which is qualified as the important customer with a certain invoice count threshold.

So, what we do is that we also look to keep the Amount Contribution of around 85% to 90%. In some cases, we drop to 80% but not beyond that (There can be exceptions where we will need to drop it even further, but for most of the cases we consider the generic % values).

We should always prioritize the Amount Contribution because there may be customers who have not raised many invoices but the Invoice Amount of those Invoices will be very high. So, these types of customers may be labeled as Non-Important if we consider the amount contributed.

5. Feature Engineering

- Features are the attributes that the model needs to learn to make predictions.
- Build customer-level features and invoice-level features. Derived features and new features can be created.
- Customer level features: Trends and behavior captured at the customer level.

Example- Average number of days the customers have taken in the past to make the payment.

- Invoice level features: The trends and behavior captured at an invoice level.

Example: Features capturing patterns like - high dollar invoices, highly delayed invoices, etc.

- Trends observed during EDA at a customer level can also be used to derive features.
- The intern should have a basic idea of how the customer-level features are made and how it is different from invoice-level features.

6. Feature Selection:

- Select features according to selection algorithms like RFE, Genetic selection.
- Explore different feature selection algorithms available.
- Feature selection can also be performed based on the observation from the EDA.
- Avoid using features that can lead to output leakage.

- Try to limit the number of features below 20.

7. Modeling/Hyperparameter tuning:

- Try to use and understand different machine learning algorithms.
- Perform hyperparameter tuning and explore different techniques for the same.
- Avoid overfitting/underfitting the model.

8. Prediction Analysis:

- The intern is expected to give supporting analysis as to why the given model or the features are performing well or if they are performing poorly.

Dynamic segmentation:

For the segmentation of the customers, two major areas around which our features revolve are:

1. **Value** – This determines the worth of a company totally based upon actual open amount or invoice amounts for a customer. Based on this we segregate the customers as HIGH and LOW.
2. **Ease of Collection (EOC)** – This area focuses upon figuring out how EASY or HARD a customer is in terms of payment collection activities based on this previous payment patterns.

- a. **Calculation of Value feature:** This feature aims to capture:
 - i.Relation b/w average invoice amount of a customer and average invoice amount within the interquartile range of invoice amount for Klockner.
 - ii.Relation b/w average invoice amount of a customer and average invoice amount across all customers of Klockner **only** for high valued invoices for **past one month**. Here high valued invoice refers to those invoices whose amount is always above a threshold. A threshold will always be configurable i.e. if invoices above 1000\$ is high valued invoice for Klockner but for some other supplier it may be 5000\$.

$$\text{Value} = W1(X1/Y1) + W2(A1/B1)$$

Here,

X1 = Average invoice amount of a customer

Y1 = Average invoice amount within the interquartile range of invoice amount for Klockner.

A1 = Average invoice amount of high valued invoices for a customer in past one month.

B1 = Average invoice amount of high valued invoices for a supplier I.e. Klockner in past one month.

W1 and W2 are weights to increase/decrease weightage of these two relations.

Calculation of ARR feature: This is also a part of value and captures the recurring revenue brought by the account's customer.

- iii. Relation b/w sum of invoice amount of a customer and sum of invoice amount within the interquartile range of invoice amount for account.
- iv. Relation b/w sum of invoice amount of a customer and sum of invoice amount across all customers of account **only** for high valued invoices for **past one month**. Here high valued invoice refers to those invoices whose amount is always above a threshold. A threshold will always be configurable i.e. if invoices above 1000\$ is high valued invoice for Klockner but for some other supplier it may be 5000\$.

$$\text{Value} = W1(X2/Y2) + W2(A2/B2)$$

Here,

X2 = Sum of invoice amount of a customer

Y2 = Sum of invoice amount within the interquartile range of invoice amount for account.

A2 = Sum of invoice amount of high valued invoices for a customer in past one month.

B2 = Sum of invoice amount of high valued invoices for an account I.e. Klockner in past one month.

W1 and W2 are weights to increase/decrease weightage of these two relations.

Important: Since we are assuming segmentation to be refreshed every month that is why we are calculating second aspect of Value and ARR every month. This will always be configurable. If refresh time for segmentation is decided to be quarter or something else, the second aspect of Value and ARR will be calculated for that period because it tends to capture most recent pattern.

b. **Ease of Collection (EOC) features** – Here we aim to capture the pattern of ease of collection in terms of 4 major categories:

- i.Amount Settled
- ii.Number of Invoices
- iii.Dates
- iv.Communication with customers

1. **Broken P2P%:** Broken promise to pay percentage at customer level.
2. **WADP:** Will be calculated first at invoice level for all the invoices which have actual open amount greater than zero or any other column that gives you invoice amount and then summed to give a single value for a customer.

$$\sum[\text{Invoice Amount} * [(\text{Paid Date}) - (\text{Document Create Date})] / [\text{Total Open Amount for Customer}]]$$

3. **Delay Ratio:** It is the ratio between the number of invoices that got delayed by the total number of invoices.

4. **Delay Sum Ratio:** It is the sum of invoice amounts of delayed invoices by the sum of (actual_open_amount) of the total number of invoices.

5. **Average Delay of Delayed Payments:** It is calculated at customer level I.e. average of delay for a customer. Summation of delay days for all the invoices that got delayed for a customer divided by number of delayed invoices.

6. **Latest Average Delay:** It is calculated at customer level to capture his delay pattern in past one moth in comparison to his average delay pattern.

Ratio of past one-month Average Delay of Delayed Payments upon
Average Delay of Delayed Payments across the entire data for a customer.

7. **ClosevsTotal:** Ratio of number of closed to total invoices for a customer for those invoices whose due date was in last month and clearing date was before last day of last month.

8. **ClosevsOpen:** Ratio of number of invoices closed last month who had due date last month itself to number of open invoices from last month.

- 9. OpenvsClose:** Ratio of number of invoices open from last month to number of closed invoices last month which were due in last month.
- 10. ClosevsTotal_Amt:** Ratio of sum of actual_open_amount for invoices closed in last month which were due in last month to total sum of actual_open_amount of all invoices due in last month.
- 11. ClosevsOpen_Amt:** Ratio of sum of actual_open_amount for invoices closed in last month which were due in last month to total sum of actual_open_amount for all invoices open from last month
- 12. Average Communication:** This feature aims to calculate number of communication made to a customer per invoice.

#Features related to Quarter are on hold as of now.

Quarter Amount Settled: Ratio of amount settled in past 3 months i.e. a quarter to sum of actual open amount for a customer.

Project Discussion:

Objectives of ML training:

Main objectives of training were to learn:

- How to determine and measure program complexity,
- Python Programming
- ML Library Scikit, NumPy, Matplotlib, Pandas, TensorFlow
- Statistical Math for the Algorithms.
- Learning to solve statistics and mathematical concepts.
- Supervised and Unsupervised Learning
- Classification and Regression
- ML Algorithms
- Machine Learning Programming and Use Cases.

How the objectives were achieved

The Academic experience I have helped me a lot in achieving the internship. During the internship we need to maintain 85% attendance this is really a big task but as a part of my academic I have learnt to maintain good attendance. The consistence, preciseness that I learnt during my academics are helping me in the internship.

Open communication was one of the strongest and most apparent skills that I learned during my soft skills session in my academics helped me while interacting with the mentors and clarifying my doubts during the internship. Skills such as multitasking, communicating, and dealing with deadlines are the things that I have learnt during my Academics this totally helped me in submitting my works on time. The basic Coding skills I learnt during my academics really helping me a lot while dealing with real time projects.

As my internship draws to a close and I reflect back on all I have learned, I realize what an excellent experience this has been. I gathered much knowledge in the classroom, but a hands-on approach has been invaluable. It will be served as a beneficial ending to my formal education. In my opinion, the best way to learn is by doing. I am truly grateful for this opportunity.

Distribution of topics and the time required

Topic Plan	No of Hours required
Highradius sessions	2 Hours/day
Placement Drives	3 Hours/week
Academic subjects	8 Hours/day
Data Structures and Algorithms	3 Hours/week
Core Subjects	2 Hours/week
Soft skills and Aptitude	3 Hours/week

Skills Learnt:

Practical Exposure:

Practical exposure assists college students to learn from their errors on the preliminary stage and makes them understand the framework of the industry earlier than stepping into the enterprise.

Benefits of Practical Exposure:

- Builds Confidence: More frequently than not, sparkling graduates without paintings revel in aspire to pursue a thrilling profession in the IT sector. With sensible publicity like internships & enterprise visits, they get the hazard to revel in how the company works in actual which in flip builds their confidence.
- Strengthen the Foundation: We research extra with the aid of using doing & experiencing. Our mind is much more likely to preserve the data won with the aid of using doing matters in actuality. Hence while you practice the ideas found out for your schoolroom to the actual world, it penetrates deeper & of course, you'd in no way be capable of wiping it off, ever.
- Build Skills, Enhances Knowledge: Handling a sensible venture includes appearing many tasks & responsibilities. It might also additionally require you to research new skills & collect extra knowledge. In the process, you come to be gaining knowledge of new skills & sprucing the present ones.
- Networking: Working as an intern opens up the door to meet & recognize new people. These new buddies if treated nicely can come to be your capacity mentors, expert references, or potential employers.
- More Efficient: With hands on practical exposure, you become more advanced and problem-solving ability improves which makes you more efficient. The efficiency is the key to success.

Constant:

Consistency means focusing on the task at hand in the present second whilst keeping a long-time period vision. When we do something regularly, we get feedback. This comment enables us to alternate routes while required. Consistency, in different words, is consequently all approximately repetition. It's approximately repeating the equal moves (behaviour and rituals) again and again; gaining comments from those moves and adjusting them for this reason to assist live heading in the right direction as we paint in the direction of our goal. Consistency ends in self-discipline, teaches self-control, improves our personality, enables us to triumph over the challenges, it helps us to be motivated and be given challenges.

Searching New Things:

It is important to explore the other domain knowledge as well. This knowledge will help us to identify our understanding capabilities of other domains. As a CSE background we try to focus on coding generally but there is lot more than coding in the IT industry. There are plenty of jobs available other than coding. For example, Machine Learning it is one of the fastest growing technology and researches estimates it will create more than 10 million jobs in next 5 years. By learning these technologies, we will be in parallel position with the current trending technologies.

And also, we need to explore web development as well because as the technology increases need for the visual impact also increases, users are expecting more and more user experience in UI. so, this is one of the important domains. Next Blockchain technology is also trending technology we should explore this technology as well. As the current cryptocurrency trend is increasing day by day the usage of this technology is also increased. By exploring this technology, we will be able to contribute to upcoming metaverse technologies as well. As it requires block chain technology and its requiem web development in higher levels known as web 3.0.

So, by exploring all these technologies we will able to find out the current changings trends and we will be taking sufficient measures to cope up with the technological changes.

Communication Skills:

Communication skills are the competencies you operate while giving and receiving one-of-a-kind sorts of information. Some examples consist of speaking new ideas, emotions or maybe an update for your project. Communication skills contain listening, speaking, observing, and empathizing.

Communication skills permit people to recognize others and to be understood themselves. A form of elements is critical within the context of those skills, consisting of listening, speaking, observing, and empathy.

There are a few unique steps that may be taken to enhance those skills. Some of those strategies are indexed below.

- Listening: Real listening is frequently constrained through humans being too brief to form a response.
- Adjust the verbal exchange fashion in keeping with the listener.
- Pay interest to frame language.
- Monitor what's being transmitted or verbalized.
- Keep a fine mindset and smile

Time Management

Time management is the technique of making plans and balancing a while among special activities. Good time control facilitates you to finish a given project in a particular time body amidst demanding situations and tight schedules. When you manipulate your agenda and deadlines, sturdy time control abilities assist you higher your recognition and flow in advance within the workplace.

What are time management skills?

Time management skills are those that assist you to operate a while efficiently and acquire favoured results. Time control abilities permit you to allocate a while well and attain duties efficiently. Some of the maximum crucial skills associated with successful time control skills include:

- Organization
- Prioritization
- Goal setting
- Communication
- Planning
- Delegation
- Stress management
- Flexibility

How to enhance your time management skills?

With confined time at your disposal and several duties to perform to your expert and private life, time control is a difficult project. Whether you are a government or a process aspirant, higher time management skills cannot most effectively assist you to emerge as a higher worker however additionally a sturdy candidate even as making use of for brand new opportunities. Some approaches to enhance your time management skills are given below:

- Prepare an agenda and comply with it strictly
- Set a few obstacles for yourself
- Fix deadlines
- Set long- and short-time period goals
- Manage your calendar efficiently
- Prioritize your assignments

Problem Solving Ability:

In this internship training I want to improve my problem-solving technique. I want it to be as good as I can because in the upcoming corporate world, I would need this at very

demand rate. More easily I am able to solve problem more efficient I become. So, it's dealing with your concepts, your practice and your ability to catch things.

This actual means is how you solve real life problems and what is your way to view things. How can you help the society, how much efficient method you can find to solve problem? So, I am definitely looking forward to improve this skill.

Problem-solving skills help you determine the source of a problem and find an effective solution. Although problem-solving is often identified as its own separate skill, there are other related skills that contribute to this ability.

Some key problem-solving skills include:

- Active listening
- Analysis
- Research
- Creativity
- Communication
- Dependability
- Decision making
- Team-building

Some examples of problem solving are:

1. Decision Making: Your decision making at the right time should be perfect. You should be able to give the solutions at that time only. It shows your mind stability level
2. Analysis: The first step to solving any problem is to analyse the situation. Your analytical skills will help you understand problems and effectively develop solutions. You will also need analytical skills during research to help distinguish between effective and ineffective solutions.
3. Communication: Your communication skills also depict your ability of problem solving. It should be clear and fine.
4. Dependability: Dependability is one of the most important skills for problem-solvers. Solving problems in a timely manner is essential. Employers highly value

individuals they can trust to both identify and then implement solutions as fast and effectively as possible.

There are some ways from which one can improve its Problem-solving skills like:

1. Technical Knowledge: More the technical knowledge you gain, more you will become knowledgeable.
2. Experience: It also plays an important role. With experience you learn everything
3. Doing Practice: Practice makes a man perfect. You should do more practice to be more accurate and good problem solver
4. Observation: Your observation also affects it. Try to observe others solutions as well. Learn how they are solving their problems and learn the positive points.
5. Find opportunities: Try to find out the maximum opportunities around you, it will keep you updated and also affect your skills as well.

Exploring Other Domains:

It is important to explore the other domain knowledge as well. This knowledge will help us to identify our understanding capabilities of other domains. As a CSE background we try to focus on coding generally but there is lot more than coding in the IT industry. There are plenty of jobs available other than coding. For example, Machine Learning it is one of the fastest growing technology and researches estimates it will create more than 10 million jobs in next 5 years. By learning these technologies, we will be in parallel position with the current trending technologies.

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metaverse technologies as well. As it requires block chain technology and its requiem web development in higher levels known as web 3.0.

So, by exploring all these technologies we will able to find out the current changings trends and we will be taking sufficient measures to cope up with the technological changes.

Attended Highradius Sessions Regularly:

- The Sessions in Highradius are about 1.5 hours per day and 0.5 hours for scrum call.
- During the master class there is a lot of content we can learn from the instructors who are basically employees in HighRadius.
- The teaching mode of instructors are direct so that the interns will be able to understand the content more easily and fatly.
- By attending the Highradius sessions regularly will give a better understanding of industry demands and what are the pre requisites we need to pursue a successful career in IT industry.
- The session is exploring different domains such as web development etc. But till now we have completed the Machine Learning module.
- By ML module I came to understand the working of Machine Learning in more practical way. So, these sessions helped me to get more practical exposure in all the given modules.
- So, I am planning to attend these sessions regularly throughout the rest of the semester.

Prepared for Placement Drives:

As we are heading toward our final year so we should be ready to face the interviews and placement drives which will be conducted by DCPD Department.

- As DCPD is conducting evening CUCAT during the week and weekends so I am planning to participate in every CUCAT without a single miss. So that questions related to aptitude, English in placements will be easy and it will be easy to crack the aptitude round.
- And also going to attend evening remedial classes to improve the necessary required skills especially in communication.
- Always try to be in contact with the placement coordinators so that all the information related to placement will be available before the deadlines.
- So, these are tasks aim planning through the rest of the semesters.

Practiced Data Structures And algorithms/Coding:

Data structures are strategies of storing and organizing information in a machine in order that operations may be completed upon them more efficiently.

The Data structures are used to store the given data in an organized manner so that the time and space complexity in accessing and storing those data is efficient and can be easily accessible.

- Now a days all the companies are demanding the students to know about Data Structures and Algorithms, this is most mandatory part to get into any company to make our career successful.
- Even Basic DSA is required by job roles which are not related to coding work. But the companies are interested to build or problem-solving skills by learning Data Structures and Algorithms.
- Lots of resources are available to learn Data Structures in different forms and there are lot online coding platforms available to practice DSA.
- So, I am planning to learn Data Structures and Algorithms in upcoming semesters to get placed in my dream company.

Prepared Core Subjects:

Core Subjects like Operating Systems, Database Management, Computer Networking are also same as important as coding skills to get into IT industry.

- Mostly product-based companies are demanding the skills in core subjects to give placement opportunity to the students.
- DBMS is one of the most essential skills that should be needed by every type of job role. Even if you are not into coding you need to learn about DBMS and the working tools.
- Operating systems should be known by every individual who wants to join in product-based companies because there you will be working on different operating systems and you will have to use different commands related to files and directories which are different for every operating system.
- Computer Networking is also one of the essential subject to learn. For development roles networking plays a major role as developers have to transfer the data from and to different webpages so that they have to know what are the protocols they are using and also to maintain whole development in a secure manner they must know networking.
- So, I am going to plan to prepare for core subjects as well in my upcoming semesters.

Improved in Soft skills and Aptitude:

Communication skills known as soft skills and Aptitude plays an important role in building self-confidence and in developing problem-solving skills and also helps in getting a placement with higher packages.

- Soft skills, even for normal person soft skills are really important to lead a well-balanced life because soft skills help us to communicate with other in an efficient manner and covey our point of view without any miscommunications,
- So that others will understand our point of view and start a conversation with us and they are able to understand the context. In this way employers try to understand the students and try to understand their point of view so if we are good at soft skills, we will be able to communicate out point of view clearly.
- Aptitude, as soft skills concentrate on communication this aptitude concentrates on thinking ability. Thinking ability refers to the problem solving. Problem solving is the most demanding skills in the current trends and are gaining huge packages.
- So, to improve our problem-solving skills, logical thinking aptitude is must and should.

- Therefore, I'm going to add aptitude and soft skills into my preparation list for the upcoming semesters and I will specially dedicate some time to participate in various soft skill sessions.

Results:

The B2B world operates differently from the B2C or C2C world. Businesses work with other businesses on credit. When a buyer business orders goods from the seller business, the seller business issues an invoice for the same. This invoice for the goods contains various information like the details of the goods purchased and when it should be paid. As a winter internship project, we will be building a web application to help the people working in the Accounts Receivable departments in their day-to-day activities.

Accounts Receivable represents money owed by entities to the firm on the sale of products or services on credit. In most business entities, accounts receivable is typically executed by generating an invoice and either mailing or electronically delivering it to the customer, who, in turn, must pay it within an established timeframe, called credit terms or payment terms. We need to build a web application where the users in the Account Receivable department can:

- In the ideal world, the buyer business should pay back within the stipulated time (Payment Term). However, in the real world, the buyer business seldom pays within their established time frame, and this is where the Account Receivables Department comes into the picture.
- Every business consists of a dedicated Account receivables Department to
- collect and track payment of invoices.
- It consists of an Account receivables team that is responsible for:
 - Collecting payments from customers for their past due to invoices.
 - Sending reminders and follow-ups to the customers for payments to be made.
 - Looking after the entire process of getting the cash inflow.
 - Help the company get paid for the services and products supplied.

Seller business interacts with various businesses and sells goods to all of them at various times. Hence, the seller business needs to keep track of the total amount it owes from all the buyers. This involves keeping track of all invoices from all the buyers. Each invoice will have various important fields like a payment due date, invoice date, invoice amount, baseline date etc.

Machine Learning is the science of getting computers to learn without being explicitly programmed. It is closely related to computational statistics, which focuses on making prediction using computer. In its application across business problems, machine learning is also referred as predictive analysis. Machine Learning is closely related to computational statistics. Machine Learning focuses on the development of computer programs that can access data and use it to learn themselves. The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide. The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

The types of machine learning algorithms differ in their approach, the type of data they input and output, and the type of task or problem that they are intended to solve. Broadly Machine Learning can be categorized into four categories.

I. Supervised Learning

II. Unsupervised Learning

III. Reinforcement Learning

IV. Semi-supervised Learning

Applications of Machine Learning:

- Web Search Engine: One of the reasons why search engines like google, Bing etc work so well is because the system has learnt how to rank pages through a complex learning algorithm.
- Photo tagging Applications: Be it Facebook or any other photo tagging application, the ability to tag friends makes it even more happening. It is all possible because of a face recognition algorithm that runs behind the application.
- Spam Detector: Our mail agent like Gmail or Hotmail does a lot of hard work for us in classifying the mails and moving the spam mails to spam folder. This is again achieved by a spam classifier running in the back end of mail application.
- Database Mining for growth of automation: Typical applications include Web-click data for better UX, Medical records for better automation in healthcare, biological data and many more.
- Applications that cannot be programmed: There are some tasks that cannot be programmed as the computers we use are not modelled that way. Examples include Autonomous Driving, Recognition tasks from unordered data (Face Recognition/ Handwriting Recognition), Natural language Processing, computer Vision etc.

Advantages of training on Machine Learning:

1. Easily identifies trends and patterns

Machine Learning can review large volumes of data and discover specific trends and patterns that would not be apparent to humans. For instance, for an e-commerce website like Amazon, it serves to understand the browsing behaviors and purchase histories of its users to help cater to the right products, deals, and reminders relevant to them. It uses the results to reveal relevant advertisements to them.

2. No human intervention needed (automation)

With ML, you don't need to babysit your project every step of the way. Since it means giving machines the ability to learn, it lets them make predictions and also improve the algorithms on their own. A common example of this is anti-virus software's; they learn to filter new threats as they are recognized. ML is also good at recognizing spam.

3. Continuous Improvement

As ML Algorithms gain experience, they keep improving in accuracy and efficiency. This lets them make better decisions. Say you need to make a weather forecast model. As the amount of data, you have keeps growing, your algorithms learn to make more accurate predictions faster.

4. Handling multi-dimensional and multi-variety data

Machine Learning algorithms are good at handling data that are multi-dimensional and multi-variety, and they can do this in dynamic or uncertain environments.

5. Wide Applications

You could be an e-tailer or a healthcare provider and make ML work for you. Where it does apply, it holds the capability to help deliver a much more personal experience to customers while also targeting the right customers.

Outcome of ML training:

I like to thank my moderators of this training Ashwin and Gautam for helping us in completing the project successfully on time. This training by HighRadius has introduced us to Machine Learning. Now, we know that Machine Learning is a technique of training machines to perform the activities a human brain can do, albeit bit faster and better than an average human-being. Today we have seen that the machines can beat human champions in games such as Chess, Mahjong, which are considered very complex. We have seen that machines can be trained to perform human activities in several areas and can aid humans in living better lives.

Machine learning is quickly growing field in computer science. It has applications in nearly every other field of study and is already being implemented commercially because machine learning can solve problems too difficult or time consuming for humans to solve. To describe machine learning in general terms, a variety models are used to learn patterns in data and make accurate predictions based on the patterns it observes.

Machine Learning can be a Supervised or Unsupervised. If we have a lesser amount of data and clearly labelled data for training, we opt for Supervised Learning. Unsupervised Learning would generally give better performance and results for large data sets. If we have a huge data set easily available, we go for deep learning techniques. We also have learned Reinforcement Learning and Deep Reinforcement Learning. We now know what Neural Networks are, their applications and limitations. Specifically, we have developed a thought process for approaching problems that machine learning works so well at solving. We have learnt how machine learning is different than descriptive statistics.

Finally, when it comes to the development of machine learning models of our own, we looked at the choices of various development languages, IDEs and Platforms. Next thing that we need to do is start learning and practicing each machine learning technique. The subject is vast, it means that there is width, but if we consider the depth, each topic can be learned in a few hours. Each topic is independent of each other. We need to take into consideration one topic at a time, learn it, practice it and implement the algorithm/s in it using a language choice of yours. This is the best way to start studying Machine Learning. Practicing one topic at a time, very soon we can acquire the width that is eventually required of a Machine Learning expert.

Challenges Faced During Internship:

During the Internship we came across lot of difficult situations. These problems are the big task and time-consuming situation for me to solve.

1. This internship allowed us to gain experience with modern technologies such as react and machine learning. In the IT industry, machine learning is flourishing. It's employed in the medical industry, on YouTube, and on a variety of other internet sites. Learning this can help you establish a good reputation in the IT business. React Js is a front-end component that makes the user interface more attractive by providing various functionalities. Because acquiring these concepts takes time, we are only given a certain amount of time to study and apply them. This has been a major issue for us throughout the interview.
2. As we attempted to connect the two, we ran into issues such as a cors error. We later looked into it on the browsers and were able to remedy it.
3. We have various algorithms to forecast the required column because we are working on a supervised machine learning model. However, the most difficult task we encountered was determining which algorithm is superior. Later, we looked into it further and employed six algorithms to make predictions, calculating their mse, r² values. This helped us figure out which method would be the best fit for the dataset.
4. Because the dataset was provided by the team, we assumed it was correct. However, we ran into issues with the java section later on. We eventually fixed the problem by adding certain limitations to the dataset.
5. We found react to be similar to html and java script while dealing with it, but the primary issue we ran into was when we needed to use components and usestates. It took a long time to learn and apply these concepts to the project.
6. The material provided by the Highradius team in their reading content portion of their website was excellent. Although the materials were insufficient to complete the job, they did assist in several ways. As a result, we've had to rely on other internet sites.

Below are the some of the difficult situation that I encountered during the Internship:

1. Selecting the best Model

2. Cross validation of dataset
3. Evaluation Metrics
4. Dealing with Date Time Values
5. Time management
6. New Learning
7. Fetching data from database.
8. Deployment of MYSQL

1. Selecting the best Model:

In the Internship we have been provided with the labelled data. In this we have to select one model to Train our data in an efficient way. So, for choosing the perfect model we came across working of different models like Linear Regression, Decision Tree, XG Boost Regression, Random Forest Tree etc. From these models we have to select the best fit model for our given dataset.

By comparing with the different MSE errors and R2 Score values I have to decide which is the best fit model for this dataset. But, in this case all the models have given approximately same MSE and R2 score values which made a difficult task for me to select a model that is best among them. As we have to go further for the Feature Engineering techniques, I have chosen the XGBoost Regressor as the best fit.

2. Cross Validation of dataset:

Generally, after Data pre-processing, we have to divide the given dataset into Train and Test Split using Sklearn libraries. So, we will get four new dataframes. But in this case, we have encountered a situation to create a validation set in this problem we have divided the dataset into four parts and further these datasets into four more dataframes. As I was new in this data processing field, I was a little bit confused about these during the splitting the data.

3. Evaluation Metrics:

We have various types of evaluation metrics to evaluate the working model like MSE, R2 Score, RMSE, Accuracy. During the first-time evaluation of the model, I obtained an accuracy of 95% which was more than a normal working accuracy. So later I realised that my datasets were overfitted with the given model. In order to reduce the over fitness of the model I have implemented the Cross-validation technique.

4. Dealing with Date Time values:

Firstly, the Data Time values columns that had given in the dataset are in Object data type. So as the evaluation model does not accept these Date Time columns in Object data type I have to convert them into datetime format. From the converted datetime columns we have to extract the date, month and year columns and store them into new columns individually. As there are ample amount of these columns, I have spent lot of time in converting the datatype of these columns into numerical format.

5. Time Management:

It was quite a thing this month which become headache this time. As I was having my MST's and Lab MSTs, so It was quite a challenging for me to manage both things at same time. But I managed it well and was able to attend classes and prepare for my exams as well. At one stage it becomes so hectic for me but still I was dedicated to both.

6. New Learnings:

I was new to some subjects like Machine learning. So, it was quite a challenge for me to learn both these subjects with hands on practice as well. So, it took some time for me to be familiar with the concepts. But I work on them hard and now I have a decent command on Machine Learning. Being a student of engineering, I should know these subjects, so I work on them and still working on them to be fully trained.

7. Fetching data from database.

In this training part we have to make a database which will contain some values like Name, age, department etc. We need to connect that database to the Java server so that we are able to send values to database and can fetch those values from database as well. So, it was quite a complicated procedure which needs your full concentration and attention. If

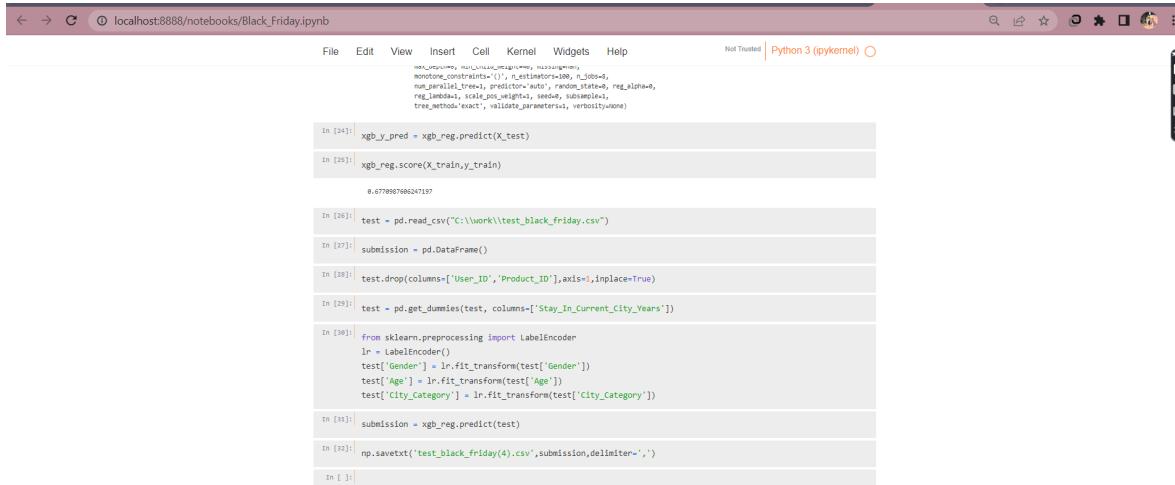
you miss a single step then it will show you error. Tomcat server is used here. We use JDBC method to connect the database. Java Servlets are used to work with Java in creating web pages on Browser.

8. Deployment:

It took some time for me to connect everything together and then deployed it. It needs numerous steps to be deployed for first time. From downloading pycharm, it took time and after facing some issues I was able to run complete circuit.

Conclusion

BLACK FRIDAY SALES PREDICTION:



The screenshot shows a Jupyter Notebook interface with the following code in cell [24]:

```
xgb_y_pred = xgb_reg.predict(X_test)
xgb_reg.score(X_train,y_train)
0.6779987668247137
```

Cell [25]:

```
test = pd.read_csv("C:\\work\\test_black_friday.csv")
```

Cell [26]:

```
submission = pd.DataFrame()
```

Cell [27]:

```
test.drop(columns=['User_ID','Product_ID'],axis=1,inplace=True)
```

Cell [28]:

```
test = pd.get_dummies(test, columns=['Stay_In_Current_City_Years'])
```

Cell [29]:

```
from sklearn.preprocessing import LabelEncoder
lre = LabelEncoder()
test['Gender'] = lre.fit_transform(test['Gender'])
test['Age'] = lre.fit_transform(test['Age'])
test['City_Category'] = lre.fit_transform(test['City_Category'])
```

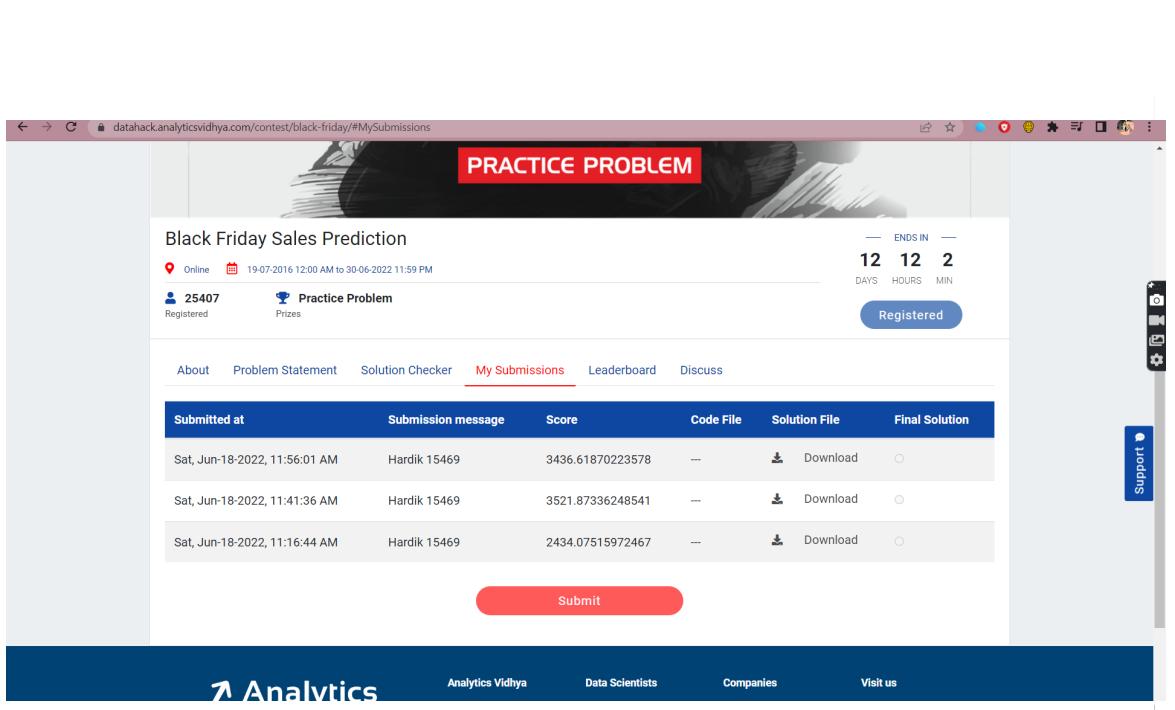
Cell [30]:

```
submission = xgb_reg.predict(test)
```

Cell [31]:

```
np.savetxt('test_black_friday(4).csv',submission,delimiter=',')
```

In []:



The screenshot shows the contest page for the "Black Friday Sales Prediction" challenge on Analytics Vidhya. The page includes:

- A banner with the text "PRACTICE PROBLEM".
- The title "Black Friday Sales Prediction".
- A timer indicating the contest ends in 12 days, 12 hours, and 2 minutes.
- A registration button labeled "Registered".
- A navigation bar with links: About, Problem Statement, Solution Checker, My Submissions (which is underlined), Leaderboard, and Discuss.
- A table showing three submission entries:

Submitted at	Submission message	Score	Code File	Solution File	Final Solution
Sat, Jun-18-2022, 11:56:01 AM	Hardik 15469	3436.61870223578	---	Download	View
Sat, Jun-18-2022, 11:41:36 AM	Hardik 15469	3521.87336248541	---	Download	View
Sat, Jun-18-2022, 11:16:44 AM	Hardik 15469	2434.07515972467	---	Download	View

A "Submit" button is located below the table.

BANK CUSTOMER CHURN:

The screenshot shows a Jupyter Notebook interface with the following code cells and their outputs:

```
In [589]: prediction4=pd.DataFrame(y_pred)
prediction4.head()

0
0 0
1 0
2 0
3 0
4 0
```

```
In [590]: #accuracy
percent1 = metrics.accuracy_score(y_test,prediction4)
percent4
```

```
In [591]: 0.8577142857142858
```

```
In [592]: models = pd.DataFrame({'name_model':["KNN","SVM","Random Forest","Decision Trees"],\
'accuracy_percentage':[percent1,percent2,percent3,percent4]})
```

```
In [593]: models
```

name_model	accuracy_percentage
0 KNN	0.830857
1 SVM	0.857714
2 Random Forest	0.863143
3 Decision Trees	0.857714

```
In [ ]:
```

The Machine Learning model we built on the trading was a Linear Regression Model and the target variable is a delay variable which tells us about the time taken by a customer to pay the loan amount. This type of we often see in Banking industry as banks provide loans to customers and collect loans from customers with some interests. So, if a bank wants to know the customer can pay the loan or not in the given time frame by looking at the previous loans taken by the customer, they can use this Linear Regression model and they will be able to find the customer can pay the loan or not.

Not only problems related to loans, Machine Learning consists of a wide of problems that can be solved by Machine Learning such as Churn prediction, Weather prediction, Weather what not everything can be solved by using Machine Learning and its suitable models with the property labelled data.

From this Machine Leering training learning outcomes are:

- Learnt about the usage of Machine Learning and how the machine learning works.
- Able to know about different types of Machine Learning models and different types of uses cases.
- Understood different types of visualization techniques to derive useful insights from the given data.
- Learned about feature engineering techniques to engineer the given data and remove the unnecessary data which will affect the performance of the model.
- Understood different feature selection techniques which are used to select the important features from the data which will be useful to build our model perfectly.
- Also, able to learn the evaluation metrices which are used to evaluate the performance of the model so that we will fix the final best working model.
- And also understood how the actual data is generated and how It is stored in databases and what is the actual purpose of storing the data.
- Learned to predict the target variable using different predicting algorithms like Linear regression, logistic regression, logistic tree, random forest boost etc.

So, by this experience I can start my career in a Machine Learning role such as Data Analyst, Data Scientist, Data Engineer etc.

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7. <https://www.tutorialspoint.com/java/index.htm>
8. <https://www.javatpoint.com/java-programs>
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