CSE498R

Spring 2021

Internship Report

on

Internship at Information & Technology Department
North South University

Supervised By

Shaikh Shawon Arefin Shimon
Lecturer
Department of Electrical & Computer Engineering (ECE)
School of Engineering & Physical Sciences (SEPS)
North South University

Submitted By

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Declaration

I do hereby declare that this internship report has been prepared by me for the fulfillment of Bachelor of Computer Science & Engineering degree from the Department of Electrical & Computer Engineering, North South University. I also affirm that this report is original in nature and has not been submitted elsewhere for any other purpose.

Signature

Abdullah Al Mahfuj Shaan
ID: 1721275042
Date: 22nd May, 2021

Approval

The internship report titled Internship at Department of Information & Technology, North South University has been submitted by Abdullah Al Mahfuj Shaan, ID 172 1275 042, to the Department of Electrical & Computer Engineering, North South University, Dhaka, Bangladesh, for the partial fulfillment of the requirements for the degree of Bachelor of Science (BSc) in Computer Science & Engineering.

NSU Supervisor

Shaikh Shawon Arefin Shimon
Lecturer, Department of Electrical & Computer Engineering
North South University
Dhaka, Bangladesh

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Acknowledgement

My sincere and deep sense of appreciation goes to all the people at the Department of Information & Technology, North South University who supported me with relevant documents to prepare this report. Firstly, I would like to express my gratitude to the Almighty, the exalted, most gracious and most merciful who have enabled me to finish this report in due time. My deepest gratitude goes to my internship supervisor Shaikh Shawon Arefin Shimon, for his generous guidance, inspiration, necessary support and recommendations during the preparation of this report. Without his help and assistance, I could not have completed this report.

Abstract

The following report contains my experience as an intern at the Department of Information & Technology, North South University during the period from 23rd February, 2021 to 5th May, 2021. During this time frame, I developed an Automated Reply System for smooth operation of communication during the unavailability of proper human resources. I worked with two other classmates, where I got to learn a lot of new technologies related to Python and Flask API based applications. The team developed an Automated Reply System using Python, NLTK and Flask API which was tested and deployed on a local server and is currently up for further testing.

The internship supervisor, Shaikh Shawon Arefin Shimon, Lecturer, North South University, routinely supervised me on this so that I could learn new things and grow myself to be an aspiring engineer. Everything that I have gained by working at the Department of Information & Technology, North South University will be visible through this report with proper scrutiny based on theory.

Description

About NSU IT

The Department of Information & Technology, North South University is responsible for all the maintenance of the technical infrastructure. Apart from building the technical infrastructure of the university, NSU IT focuses on the technical support for the students of the university as well. NSU IT is a digital solution for ensuring maximum support and comfort to the students. They provide an accurate system of premise and real-time support to benefit users. They simplify the problems and solve them instantly! NSU IT also provides an end-to-end security system that is technically solid and ensures data security.

By providing the full cycle of services, the aim of the organization is to provide seamless service to the students and also maintain the infrastructure of the university.

Services of NSU IT

- **Faculty Portal**

  NSU IT provides support for the faculties to perform various activities on this platform, such as; taking attendance & submitting grades.

- **Student Portal**

  NSU IT has a standalone portal for the students to register courses for each semester, perform their degree application, pay tuition fees or apply for academic documents.

- **Parent Portal**

  The department has a separate portal for the parents to check if the students are performing well enough and is up to date with the university.

- **Online Admission**

  NSU IT has developed a platform where new students can register and take admission without coming to the university.

- **Online Degree Verification**

  Providing support for the students to apply for their degrees on the online platform.

- **Classroom Support**

  With the help of experts, NSU IT provides classroom support, such as; installing OS and necessary software in the classroom PCs
- **Computer Lab Support**

  They also maintain the computer labs and its components and also checks if hardware and software are up to date.
- **Software & Hardware Support**

  They provide software and hardware support for the administrative staffs and faculties if needed.
- **Print Zone**

  NSU IT also maintains a printing zone, which facilitates students to print their lecture materials and other items.
- **Network Support**

  They provide network connectivity and maintain the whole network infrastructure of the university.

Development Tools and Softwares

NSU IT uses a number of different softwares and programming languages to develop and maintain the infrastructure.

- **Online Portals**

  They are developed based on Javascript, Laravel and PHP.
- **Automated Reply System**

  This was developed using Python, NLTK and Flask API.
- **Database**

  MySQL is the primary database query language used in the department.

Other softwares and tools are used whenever it is necessary to develop a particular software.

Version Control

BitBucket is the primary tool used for version control in the department. Bitbucket Cloud is a Git based code hosting and collaboration tool. BitBucket provides one place for any team to collaborate on code from concept to Cloud, build quality code through automated testing, and

deploy code.

Since BitBucket supports CI/CD, this is used as the primary tool. Build, test and deploy is easier since CI/CD is already integrated into BitBucket.

Continuous integration is a coding philosophy and set of practices that drive development teams to implement small changes and check in code to version control repositories frequently. The technical goal of CI is to establish a consistent and automated way to build, package, and test applications. With consistency in the integration process in place, teams are more likely to commit code changes more frequently, which leads to better collaboration and software quality. Continuous delivery picks up where continuous integration ends. CD automates the delivery of applications to selected infrastructure environments. Most teams work with multiple environments other than the production, such as development and testing environments, and CD ensures there is an automated way to push code changes to them.CI/CD tools help store the environment-specific parameters that must be packaged with each delivery. CI/CD automation then performs any necessary service calls to web servers, databases, and other services that may need to be restarted or follow other procedures when applications are deployed.

We did not maintain a proper version control for our project, but we kept backups on GitHub Repo of the main files after integrating something and before applying something new.

Testing

- **Integration Testing**

  After each unit is thoroughly tested, it is integrated with other units to create modules or components that are designed to perform specific tasks or activities. These are then tested as a group through integration testing to ensure whole segments of an application behave as expected (i.e, the interactions between units are seamless). These tests are often framed by user scenarios, such as logging into an application or opening files. Integrated tests can be conducted by either developers or independent testers and usually consist of a combination of automated functional and manual tests.

- **System testing**

  This testing method is used to evaluate the completed and integrated system, as a whole, to ensure it meets specified requirements. The functionality of the software is tested from

end-to-end and is typically conducted by a separate testing team than the development team before the product is pushed into production.

Internship Activities

My internship at the Department of Information & Technology, North South University started on February 25th 2021. I submitted the project description, project technology, and project timeline the day before. I was assigned a personal computer and desk. I installed the OS and other necessary software. And started to work according to the timeline I submitted.

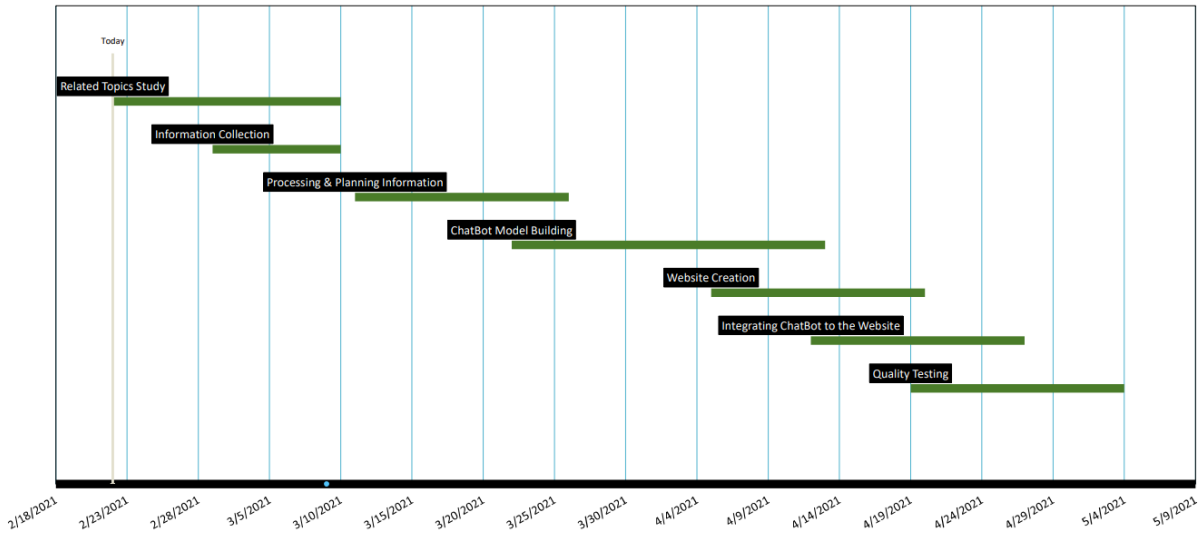

Figure 0: Gantt chart

Related Topics and Processing Information

My task for the first week was to read about related articles and technologies that can be used in the Automated Reply System. I found a few relative articles and projects from which I gathered ideas to start the project. I started reading articles on medium.com that are related to Chatbots and its features. I wrote a summary of all the articles that I read throughout the day and gathered a lot of information that is going to help to build this project. Also, I got some insights about some of the roadblocks that I might have to face while doing the project. I started to read about the Flask framework. I tried to read some of the codes from Github. I also read about the Tensorflow API which is required for Natural Language Processing. I also saw a tutorial on Youtube, where it is shown how to implement a Chatbot with Flask.

One of the main tasks was to collect all the types and formats of data that we are going to input into the model. I proofread the dataset from scratch to find mistakes. And also added some more data if needed.

Project Description

Automatic Reply System has been developed on the Python platform using Google's Tensorflow API, Natural Language Toolkit and Flask as the backend server. Python 3.8 has been used as the primary programming language for the project. Other programming languages and scripting languages have been used as well, for example: Javascript, CSS, HTML. CSS and HTML has been used to build the Front End of the project. Javascript has been used to connect with Flask to the Website.

- **Tensorflow**

  TensorFlow is an open source library for numerical computation and large-scale machine learning. TensorFlow bundles together a slew of machine learning and deep learning (aka neural networking) models and algorithms and makes them useful by way of a common metaphor. It uses Python to provide a convenient front-end API for building applications with the framework. The single biggest benefit TensorFlow provides for machine learning development is abstraction. Instead of dealing with the nitty-gritty details of implementing algorithms, or figuring out proper ways to hitch the output of one function to the input of another, the developer can focus on the overall logic of the application. TensorFlow takes care of the details behind the scenes.

```
model = tf.keras.Sequential()

model.add(tf.keras.layers.InputLayer(input_shape=(len(training[0]))))
model.add(tf.keras.layers.Dense(8))
model.add(tf.keras.layers.Dense(8))
model.add(tf.keras.layers.Dense(8))
model.add(tf.keras.layers.Dense(len(output[0]), activation="softmax"))
```

Figure 1: Use of Tensorflow in the project

- **Natural Language Toolkit (NLTK)**

  NLTK (Natural Language Toolkit) is a suite that contains libraries and programs for statistical language processing. It is one of the most powerful NLP libraries, which contains packages to make machines understand human language and reply to it with an

appropriate response. Natural Language Processing with Python provides a practical introduction to programming for language processing. Written by the creators of NLTK, it guides the reader through the fundamentals of writing Python programs, working with corpora, categorizing text, analyzing linguistic structure, and more.

```
def bag_of_words(s, words):
    bag = [0 for _ in range(len(words))]

    s_words = nltk.word_tokenize(s)
    s_words = [stemmer.stem(word.lower()) for word in s_words]
```

Figure 2: Use of NLTK to tokenize words

- **Flask API**

  Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.

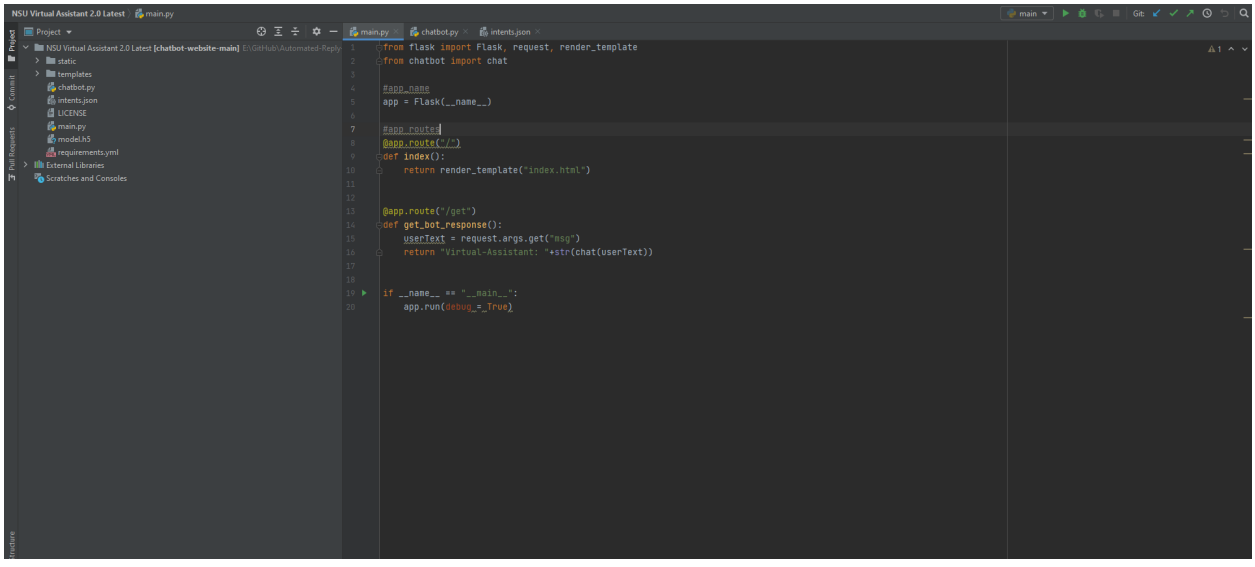

Figure 3: Use of Flask Framework in the backend.

- **Front End**

  The front end of the application has been built using Javascript, CSS and HTML. CSS and HTML has been used as the primary scripting language for the design of the application. And Javascript has been used to connect it to the server.

Figure 4: Front end of the Website

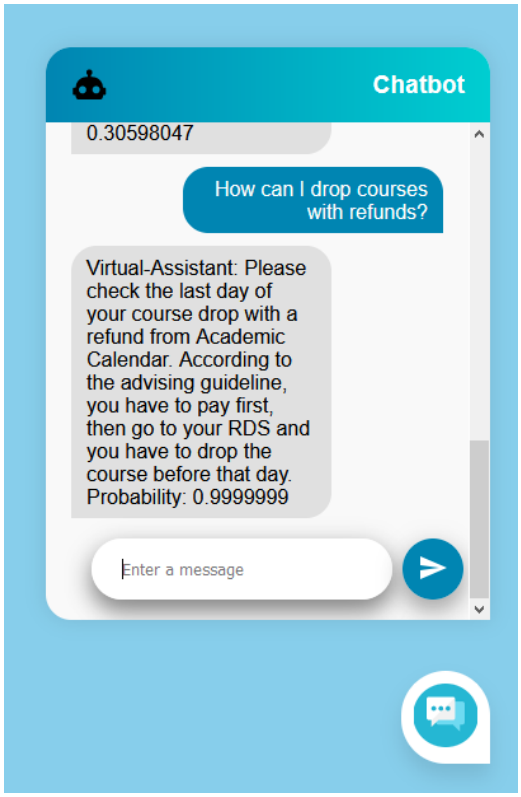

Figure 5: Chat Window of the Reply System

- **Back End**

  The backend of the application has been built using Python, NLTK and Tensorflow API.

```
import numpy
import tensorflow as tf
from tensorflow import keras
import random
import json


#Reading Dataset from Json File
with open("intents.json",encoding='utf-8') as file:
    data = json.load(file)

words = []
labels = []
docs_x = []
docs_y = []

#Finding Patterns and tags accordingly
for intent in data["intents"]:
    for pattern in intent["patterns"]:
        wrds = nltk.word_tokenize(pattern)
        words.extend(wrds)
        docs_x.append(wrds)
        docs_y.append(intent["tag"])

    if intent["tag"] not in labels:
        labels.append(intent["tag"])

words = [stemmer.stem(w.lower()) for w in words if w != ("?" or "!")]
words = sorted(list(set(words)))

labels = sorted(labels)

training = []
output = []

out_empty = [0 for _ in range(len(labels))]

for x, doc in enumerate(docs_x):
```

Figure 6: Backend of the Deep Learning Model

- **Dataset**

  The dataset of the project contains possible questions, tags and answers. It has been built using the JSON Format, which is a preferred format of data used in Deep Learning models for Natural Language Processing.

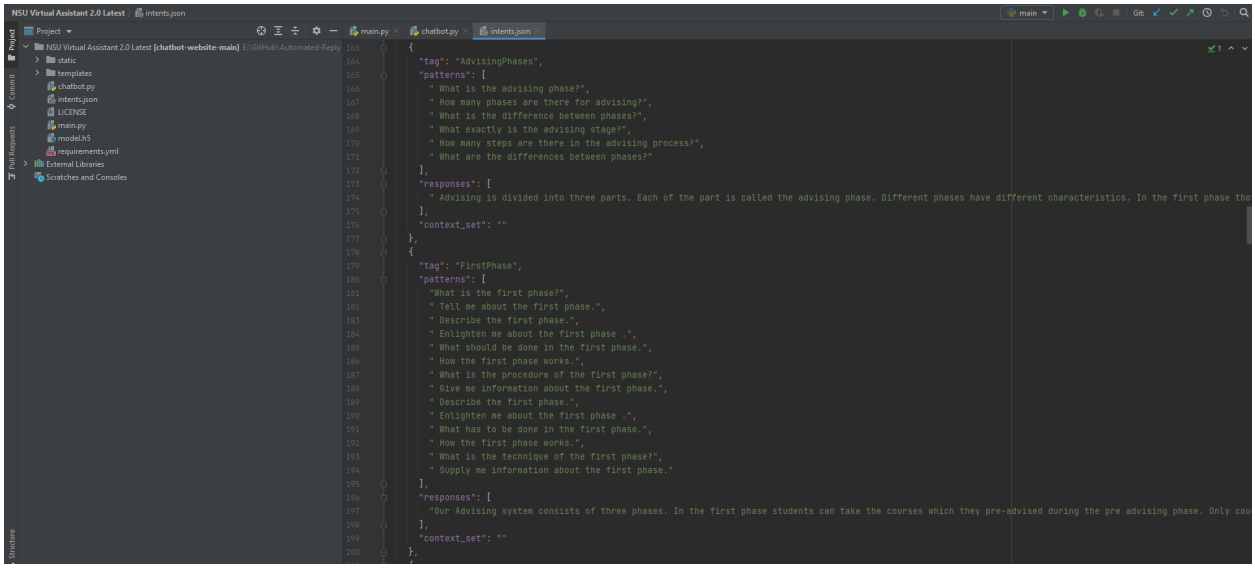

Figure 7: Intents or dataset of the model

- **Natural Language Processing Methods**

  NLP is a technological process that allows computers to derive meaning from user text inputs. In doing so, it attempts to understand the intent of the input, rather than just the information about the intent itself. There are a number of different ways in which this function can be built.

  - **Tokenizing:** The chatbot starts by turning text into tokens and removing punctuation.
  - **Normalizing:** Next, the bot finds common misspellings, slang, or typos in the text and converts these to its “normal” version.
  - **Recognizing Entities:** Now that the words are all normalized, the chatbot seeks to identify which type of thing is being referred to..
  - **Dependency Parsing:** For the next step, the bot splits the sentence into nouns, verbs, objects, punctuation, and common phrases.
  - **Generation:** Finally, the chatbot generates a number of responses using the information determined in all the other steps and selects the most appropriate response to send to the user.

- **Deep Learning Model**

In our training model we have used “adam” as the optimizer, categorical cross-entropy as the loss function which calculates the loss of the model in each step and “accuracy” as the only evaluation metric for giving out the results for questions. After the model is trained it saves the output as a “.h5” format file for the testing part.

```
#Training function
def train():

    model.compile(optimizer="adam", loss="categorical_crossentropy", metrics=["accuracy"])
    model.fit(training, output, epochs=10000, batch_size=256)
    model.save('model.h5')
```

Figure 8: Model

- **Model Loss Function**

I used Categorical Cross-Entropy in our model as the loss function. Also called Softmax Loss. It is a Softmax activation plus a Cross-Entropy loss. When this loss function is used, it will train a CNN to output a probability over the C classes for each image. It is used for multi-class classification which is mandatory for our model. These are tasks where an example can only belong to one out of many possible categories, and the model must decide which one.

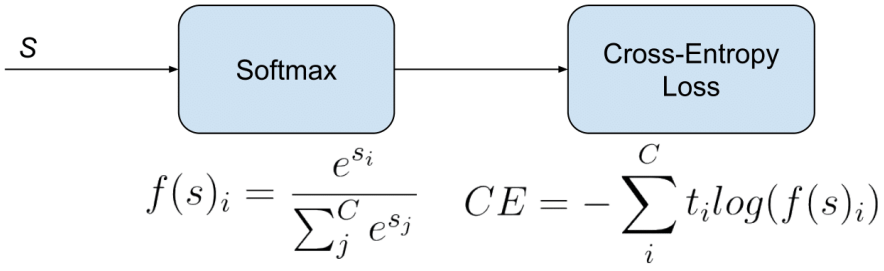

Figure 9: Categorical Cross Entropy Pipeline

Reflection

My Experience

As I immersed myself in an unfamiliar environment with standards higher than usual, I discovered so much more about myself. This internship helped me to overcome my shyness, how to warm up to people, or even how well I work with others. It's through experiencing these new things I identified strong qualities as well as qualities to improve on.

For instance, being assigned to the team during the internship helped me to know whether I work better with others or better alone. I also began to identify how I approach problems and how I make the most of a situation. I learned my strengths and weaknesses so I can highlight what I am good at and improve on what I am not.

How does this influence my career?

Before my internship, I had some doubts about my future career. I was not sure what I would like to continue after finishing my degree. I also did not know what type of work I would like to do. Through this internship, I have seen what elements of my career I like and I got enthusiastic to work somewhere. I have found out that part of the work should contain research as I did in the internship. I would like to continue working on software development if it is possible.

Conclusion

On the whole, this internship was a useful experience. I have gained new knowledge and skills. I achieved several of my learning goals, however for some the conditions did not permit.

I got insight into professional practice. I learned the different facets of working within a competitive environment. I experienced that dedication, as in many organisations, is an important factor for the progress of projects. Related to my study I learned more about the software development process and how to write clean code from scratch. There is still a lot to discover and to improve. The internship was also good to find out what my strengths and weaknesses are. This helped me to define what skills and knowledge I have to improve in the coming time. It would be better that the knowledge level of the language is sufficient to contribute fully to projects. However I could perform certain tasks in research better if I practice/know more research methodologies. It would also be better if I can present and

express myself more confidently. At last this internship has given me new ideas and motivation to pursue a career in software development.

Appendix

1. **Weekly Reports**
   Week 1
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   Intern Evaluation Form
3. **FORM ID: LOAF.001**
   Student Learning and Outcome Achievement Form

Form ID:INT.EVAL.001

CSE498R/EEE498R/ETE 498R

Intern Evaluation Form

Department of Electrical and Computer Engineering
School of Engineering and Physical Sciences (SEPS)
North South University, Bashundhara, Dhaka-1229, Bangladesh

Student's Information

Student's Name	Abdullah Al Mahfuj Shaan
Student ID	172 1275 042
Contact Number	+8801847061645

Evaluator's Information

Name	Mahbubul Haq Sarker
Company/Organization	North South University
Office address	
Contact Number	+880-2-55668200 Ext.:1401
Email address	mahbubul.sarker@northsouth.edu

Internship Details

Number of Weeks Worked	10
Number of Hours Worked	350

Evaluation Criterion:

The following skill sets and performance indicators will be rated by the industry evaluator.
Scale: *5=Excellent, 4=Above Average, 3=Average, 2=Below Average, 1=Poor, NA=Not Applicable*

Criteria	Scale					
	5	4	3	2	1	NA
1. Quality of assigned work received		√				
2. Quality of written communication skills		√				
3. Quality of oral communication skills		√				
4. Quality of computer/technical skills		√				
5. Ability to work with others		√				
6. Attendance & punctuality	√					
7. Professional demeanor		√				
8. Professional appearance		√				
9. Quality of computer/technical skills		√				
10. Use of time management skills		√				
11. Judgment/decision making skills			√			
12. Adaptability& Flexibility	√					
Total Score:	**49**					

Form ID:INT.EVAL.001

What are the intern's greatest strengths?

Mr. Abdullah Al Mahfuj Shaan is strong in debugging both software and hardware issues. He is also strong in webpage design and analysis. His soft skills are excellent.

In what areas does the intern need to improve?

Mr. Abdullah Al Mahfuj Shaan needs to improve on his soft skills.

Would you consider this intern for a permanent position?

N/A

Would you be willing to supervise additional NSU Engineering Interns?

Yes. Currently, we are considering 2 to 3 Interns every semester.

On behalf of Director; IT

20-05-21

Evaluator's Signature & Date

Form ID: LOAF.001

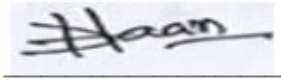
CSE498R/EEE498R/ETE 498R

Student Learning and Outcome Achievement Form

Department of Electrical and Computer Engineering
School of Engineering and Physical Sciences (SEPS)
North South University, Bashundhara, Dhaka-1229, Bangladesh

Student Name:	Abdullah Al Mahfuj Shaan
Student ID:	1721275042
Name of Organization:	Department of Information & Technology
Duration of Internship:	10 Weeks
Student's Feedback:	I discovered so much more about myself. This internship helped me to overcome my shyness, how to warm up to people, or even how well I work with others. It's through experiencing these new things I identified strong qualities as well as qualities to improve on.
What were the objectives of your internship and did the internship help you to achieve them?	Before my internship, I had some doubts about my future career. I was not sure what I would like to continue after finishing my degree. I also did not know what type of work I would like to do. Through this internship, I have seen what elements of my career I like and I got enthusiastic to work somewhere. I have found out that part of the work should contain research as I did in the internship. I would like to continue working on software development if it is possible.
What aspects of the internship did you enjoy most?	I got insight into professional practice. I learned the different facets of working within a competitive environment. I experienced that dedication, as in many organisations, is an important factor for the progress of projects. Related to my study I learned more about the software development process and how to write clean code from scratch.

Did this internship extend the academic support?	Yes. It did extend my academic support.



22-05-2021

(Name and Signature of the Student with Date)

❖ **Week 1**

CSE498R
Spring 2021
WEEKLY REPORT
Intelligent Reply System (NSU Chatbot)
Week 01
Abdullah Al Mahfuj Shaan
172 1275 042

Date	Today's Task	Tomorrow's Task	Roadblocks
23rd Feb, 2021	Today's task is to receive the PC and install the necessary softwares, that is required for this project. Also I set up and fixed my workstation with all the necessary items that are necessary.	Studying related topics on various platforms. Materials are mostly articles, journals, blogs and videos of different Chatbots and its features.	Upon receiving the PC, I installed the OS and installed the necessary softwares. But the PC was very slow initially, so it took a very long time to get everything updated. Also, there was no internet connection on my desk, so I requested it and it was set up later in the day.

24th February, 2021	I started reading articles on medium.com that are related to Chatbots and its features. I wrote a summary of all the articles that I read throughout the day and gathered a lot of information that is going to help to build this project. Also, I got some insights about some of the roadblocks that I might have to face while doing the project.	Studying related materials: Flask Documentation, Tensorflow, Tech With Tim.	I did not face any major roadblock today. But I did get frustrated sometimes after reading some of the articles.
25th February, 2021	Today I started by reading about the Flask framework. I tried to read some of the codes from Github. I also read about the Tensorflow API which is required for Natural Language Processing. I also saw a tutorial on Youtube, where it is shown how to implement a Chatbot with Flask.	I will see some tutorials related to NLP, Chatbot with Flask. Installing and setting up the environment for developing the Chatbot.	I tried to implement the chatbot by seeing the tutorial. But there were some major environment errors.

28th February, 2021	I read documentation for Flask, Tensorflow and Keras. I also read some stackoverflow threads. I also set up my preliminary environment.	To read about the Django framework. Also I need to see some data types for the dataset. For example, JSON or PICKLE format documentation.	Installing Tensorflow was a hefty task. There were many conflicts between the dependencies. Python versions were updated to the latest. But it did not have any support for Tensorflow 2.3.1
1st March, 2021	Today I read about Django Framework. And saw if it is actually applicable for the project. I also started to read about JSON and PICKLE data for the dataset.	To collect some Django based Chatbots and go through the documentation and implementation.	I found it very difficult to understand the Django model with the Web API.
2nd March, 2021	Today I downloaded some Django based Chatterbots and tried to implement the baseline version of those projects.	To learn more about Web Widgets and how to run the Deep Learning model in the backend server using Flask.	There were environmental issues related to the Django Framework Chatbots.
3rd March, 2021	I got to know about some of the features of Web Widgets and how it works. Also I learnt about Flask's server side implementation.	To scribble about the preliminary design for the UI of the Chatbot. Also to learn more about the Dataset preparation and Tensorflow Backend.	I still could not find out completely about integrating the Chatbot into the Website, for example, a pop up will come and say “Hi there”.

			Like it's on most websites these days. There was no proper information regarding these widgets.
4th march, 2021	I downloaded some of the templates that might be useful in building and designing the UI of the Website. Also I tried to implement a particular UI related to the Chatbot. I also learnt about the Dataset. For example: How to set up questions and their corresponding answers using JSON format data.	Next week, I will be working on preparing the Dataset and collecting more information on the Server Side implementation for the Chatbot.	JSON format data needs to be very precise and if there are any anomalies the data doesn't work at all. Even though it might be hard to write each and every single question and answer. This is the easiest way to build the dataset. Or I might also use a text to JSON converter if it works perfectly.

❖ **Week 2**

CSE498R
Spring 2021
WEEKLY REPORT
Intelligent Reply System (NSU Chatbot)
Week 02

Abdullah Al Mahfuj Shaan
172 1275 042

Date	Today's Task	Tomorrow's Task	Roadblocks
7th March, 2021	Today's task is to collect all the types and formats of data that we are going to input into the model.	Collecting more information on the different types of tags, questions and answers we were going to put in the dataset.	Collecting a large-scale dataset is quite tough.
8th March, 2021	The main task is to create a FAQ for the advising system. So, more information is collected regarding this topic.	Writing all the collected data in a DOCX format, so that it can be processed into JSON format with ease.	Today I did not face any roadblock.
9th March, 2021	I wrote the data for the advising part in a DOCX format.	I will collect more data on other FAQs and write them in the DOCX.	No roadblock faced.

10th March, 2021	Collected more data on some general questions that are asked by the students.	Compile all the data in one DOCX and proofread them.	No roadblock faced.
11th March, 2021	Today I compiled all the DOCX data into one single file. And also did some proofreading for all the sentences.	Next week's task is to write all the tags, questions and answers into the JSON format to feed it into the model for the training part.	No roadblock.

❖ **Week 3**

CSE498R
Spring 2021
WEEKLY REPORT
Intelligent Reply System (NSU Chatbot)
Week 03
Abdullah Al Mahfuj Shaan
172 1275 042

Date	Today's Task	Tomorrow's Task	Roadblocks
14th March, 2021	Today I started writing the dataset for other FAQs	Write another dataset.	No roadblock faced.

15th March, 2021	Today I reported the written DOCX file to the Supervisor. He gave another task to rewrite some of the questions and related answers.	Find out more data and write them in the doc.	No roadblock faced.
16th March, 2021	I proofread some of the data and edited a few of them according to the instructions from the supervisor.	Proofread the dataset.	No roadblock faced.
18th March, 2021	I started proofreading the dataset from scratch to find mistakes. And also add some more data if needed.	Next week's task is to find a model suitable for our project.	No roadblock faced.

❖ **Week 4**

CSE498R
Spring 2021
WEEKLY REPORT
Intelligent Reply System (NSU Chatbot)
Week 04

Abdullah Al Mahfuj Shaan
172 1275 042

Date	Today's Task	Tomorrow's Task	Roadblocks
21st March, 2021	Finalize JSON Data	Start building the Chatbot Model	There were lots of errors in the JSON data, mainly due to missing quotations.
22nd March, 2021	Today I discovered some state of the art Chatbot models. I also looked into their implementation methods.	To decide the Chatbot model according to our requirement.	Since there were a lot of models, it was very difficult to decide which model to go for and look into.
23rd March, 2021	I looked into some of the Chatbot model codes on Github and read their implementation method, so that it becomes easier for me to decide which model to go with.	Discover some more models to work on. Because this is an enterprise level project, I need to take many things into account.	Most of the models are based on Python and they are not conversational chatbots, but I need to find a conversational chatbot which implements NLP.
24th March, 2021	I gathered some resources which will allow me to build this Chatbot model based on NLP and Flask Framework.	To read more about Flask and NLP.	I am not familiar with NLP and Flask. So I had to go very slowly regarding this.
25th March, 2021	Today I started to see some NLP and Flask tutorials that will help me understand the already built models, which I will modify later on.	To learn how to implement Flask and NLP on Chatbot models.	There were lots of issues while installing NLP Dependencies on the PC.

❖ **Week 5**

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Week 05
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Date	Today's Task	Tomorrow's Task	Roadblocks
28th March, 2021	This week I am going to build and train our model on the dataset we created last week. I looked into some of the models that were used on many Conversational Chatbots on the web.	To select some of the models that are available with resources. And to work on them.	There were very few conversational chatbot models, most of them were Support Chatbots with selective features.
29th March, 2021	Today I read some articles on medium.com regarding some NLP Models that can be used on our project. I also selected a specific model that is based on the NLTK Python Package for solving NLP problems.	To find some other models if they are available with source codes and compare them with the existing model that I found.	These models are a bit complex than usual and it's taking more time to understand how it is implemented.

31st March, 2021	I made the initial Chatbot architecture using Python's NLTK package. And used our dataset on the model to train it.	Fine tune the model based on today's performance of the model and also to look at some other architectures.	During the initial training phase there were many wrong predictions.
1st April, 2021	We fine tuned the model according to the dataset. It is working well now. I have also looked into another Python/Cython Package named spaCy which is mainly used in enterprise level chatbots. Since NLTK is mainly used for research purposes. I will also look into that model if it's necessary. Until then, the NLTK based model task is finished.	Next week, I am going to work on the Web Design and Deployment process.	I got a little confused when I found out that NLTK is used for research purposes and not enterprise model building. Nonetheless, I am still using it, because it is working fine till now. If it fails during the Testing phase I can easily switch to the spaCy version of the Chatbot. I just to train the model using the dataset that we have already completed and fixed.

❖ **Week 6**

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Date	Today's Task	Tomorrow's Task	Roadblocks
4th April	Today I built the front page of the web page on which we will integrate our Chatbot Widget.	No work. Lockdown.	No roadblock faced.
5th April	Office Closed. No work.	Office Closed. No work.	Office Closed. No work.
6th April	Office Closed. No work.	Office Closed. No work.	Office Closed. No work.
7th April	As a part of NSU-IT, we helped in the preparation and rehearsal for the 23rd Convocation of NSU.	We will be working as a key member for the Convocation of NSU.	No roadblock faced.

8th April	Today, we performed the final test and completed the 23rd Online Convocation of NSU with success.	No work until lockdown ends.	No roadblock faced.

❖ **Week 7**

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Date	Today's Task	Tomorrow's Task	Roadblocks
11th April	We worked on the chatbot widget.	Report to our advisor about the progress that we have made so far.	Finding resources for the widget was a challenging task.
12th April	Today we reported all the works so far we have done to our advisor. And also told about our future improvements.	Continue working on the model accuracy and minor bug fixes.	No issues faced.

13th April	We went through our code once more to fix some bugs which usually caused the bot to give wrong answers.	We might have to work from home, because of the lockdown but no instructions given yet so far.	No roadblocks faced.
14th April	No Work From Home	-	-
15th April	No Work From Home	-	-

❖ **Week 8**

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Week 08
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Date	Today's Task	Tomorrow's Task	Roadblocks
18th April	Improve the design and add some changes in the widget.	Try to implement it on a live website.	Those new changes caused some more issues.
19th April	Tried implementing it on our web server but failed.	Try to solve these issues.	We could not find the reason.

20th April	Again tried some bug fixes and installed our app to the live website. But still it is not responding.	Fix the deployment problem.	Still we have no such idea what is the reason.
21th April	Today we have figured out that as the web server does not support python app	Study some alternative approaches for the deployment.	We have no solution for the issue we have found.
22th April	Have studied some new implementations.	We need to talk to a member of our NSU-IT software team member for the implementation	-

❖ **Week 9**

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Date	Today's Task	Tomorrow's Task	Roadblocks

25th April	Write clean code and debug the project.	Main task of this week is to debug the code and fix all bugs and implement it on live data.	As testing is very new to me it was quite difficult on the first day.
26th April	To read the code and comment as needed, also segment the code into different parts.	To comment on the code sections.	No roadblocks faced.
27th April	Trying to fix some errors that we ignored during the build up phase.	Fix other warnings and errors.	Some of the bugs still remain unsolved.
28th April	Fixed a few bugs and errors.	Fix other warnings and errors.	We still have a lot of warnings that remain to be solved.
29th April	Fixed most of the bugs and wrote clean code, with appropriate comments.	Showed the code to the project supervisor for further invigilation.	Segmentation and fixing bugs took most of the time out of it.

❖ **Week 10**

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Date	Today's Task	Tomorrow's Task	Roadblocks
5th May	I was asked to give a presentation on how to install the project on a local machine on Windows platform, how the project works, machine learning models that we have used on the project. I have been instructed to transfer the project to BitBucket, so that they can see and work on further development of the project. I have also been assigned to update the GitHub Readme.md file with proper instructions of installing and running the project on a local machine and how to deploy it.	Write instructions for GitHub and BitBucket.	None

	And other team members were instructed to install the project on a Linux environment and were also asked to write instructions for that.		