

# Assignment 1 (Total: 100 marks)

## 1. Instructions

1. Complete all the tasks in this assignment.
2. This is an individual assignment.

## 2. How to submit the answer

Your **final submission** should contain the following.

- a. Exported files from Google Teachable Machine for problem One (*See Annex B How to save the projects and link for submission*)
  - b. Exported files from Google DialogFlow for problem Two (*See Annex B How to save the projects and link for submission*)
  - c. **123456A**\_answers.docx (word file)
    - i. You must insert and sign off the plagiarism declaration on the first page of the answer
    - ii. You must indicate the tasks and parts that you are explaining. There should be **THREE** tasks for each problem:
      1. Problem Definition
      2. Solution Formulation
      3. Prototype solution and Test cases with explanation
- Rename **123456A** to your admin number
  - Zip up the above 3 sections into a zipped file and rename the zip file to your admin number.
  - Submit the zipped file to BrightSpace by 5 Dec 2022( Monday) 23:59hr.

### 3. Task

You must research **TWO** problems/challenges that the **industry** is currently facing. **Apply Computer Vision (Google Teachable Machine) on one of the problems and Natural Language Processing (Google DialogFlow) on the other. The 2 problems you are working on need to be from different industries.**

Following are some examples of the industries you can consider:

- Logistics and Transportation
- Healthcare
- Retail and Ecommerce
- Travel and Hospitality
- Manufacturing
- Financial, Insurance, and Banking
- Real Estate
- High-tech (e.g., telecom)
- Government & Administrative
- ***Your research industry or Others***

Definition of a problem:

A matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome.

You must complete all the following tasks for each of the scenarios:

*(See Annex A for grading rubrics)*

1. Problem Definition (Between 300 to 500 words)
  - Identify the Industry where the problem you have researched on
  - Give a summary of the industry and explain the problem  
Analyze two potential impacts/damages from this problem *(See Annex C for example)*
  - The problem needs to be related to the real-world problem and its industry domain

2. Solution Formulation (Between 300 to 500 words)

- Justify why you need to use Artificial Intelligence to solve the problem you defined for the industry.
- Describe how the solution is formulated (by using Computer vision or Natural Language Processing (NLP) )
  - a) State the data used and explain why the data is being selected to solve the problem
  - b) Why the Computer vision or NLP model is selected to solve the problem
  - c) Describe the process of how you develop and test the AI system. How do you ensure the performance of the AI solution?
  - d) how to deploy the AI solution into the problem environment to solve the defined problem
  - e) *You can add other relevant explanations to describe your solution formulation*

3. Prototype solution and Test cases with explanation (Between 300 to 500 words)

- You must create a prototype using the Google Teachable Machine (for Computer Vision) OR Dialogflow (for the NLP Chatbot) that you have learned in the labs.
  - a) Test and ensure it is functional. Upload the model to the cloud. **Get the link and submit the model link in the written report.**
  - b) Exported files from Google Teachable Machine or Google Dialogflow for submission. (refer to Annex B in this document to learn how to export the files and links)
- Select 2 test cases, use your prototype to test and explain how the AI system helps to solve the problem. You must clearly explain with your problem defined.
  - a) Screen capture the input data and output predicted result
  - b) Describe and explain how the AI prediction helps to solve the problem in each of the test cases

Annex A: Grading Rubrics (for marking each of the scenarios)

	<b>Need Improvement (0 – 2.5)</b>	<b>Satisfactory (&gt;2.5 - 5.0)</b>	<b>Good (&gt;5.0- 7.5)</b>	<b>Very Good (&gt;7.5 – 10.0)</b>
<p>Problem definition and impact analysis (10 marks)</p>	<p>Demonstrates a limited ability in identifying a problem statement and limited relation to real-world scenarios</p> <p>The identification or definition of the problem is unclear and/or subjective.</p> <p>The impacts identified are partially or not related to the problem.</p>	<p>Demonstrate some ability to construct a problem statement with evidence of some relevant contextual factors as it relates to real-world scenarios.</p> <p>The problem is identified and defined in a manner that is sometimes/somewhat unclear and/or may manifest some subjectivity.</p> <p>Identify some of the impacts that arise from the problem but unclear analysis.</p>	<p>Demonstrates the ability to construct a problem statement with evidence of the most relevant contextual factors as it relates to real-world scenarios.</p> <p>The problem is clearly and objectively identified and defined; some detail may be imprecise (general) or unelaborated.</p> <p>Precisely identify and analyze some of the impacts that arise from the problem.</p>	<p>Demonstrates the ability to construct a clear problem statement with evidence of excellent contextual factors as it relates to real-world scenarios.</p> <p>The problem is clearly and objectively identified with concise language and defined with consistent precision of detail.</p> <p>Precisely identify and analyze all of the impacts that arise from the problem.</p>

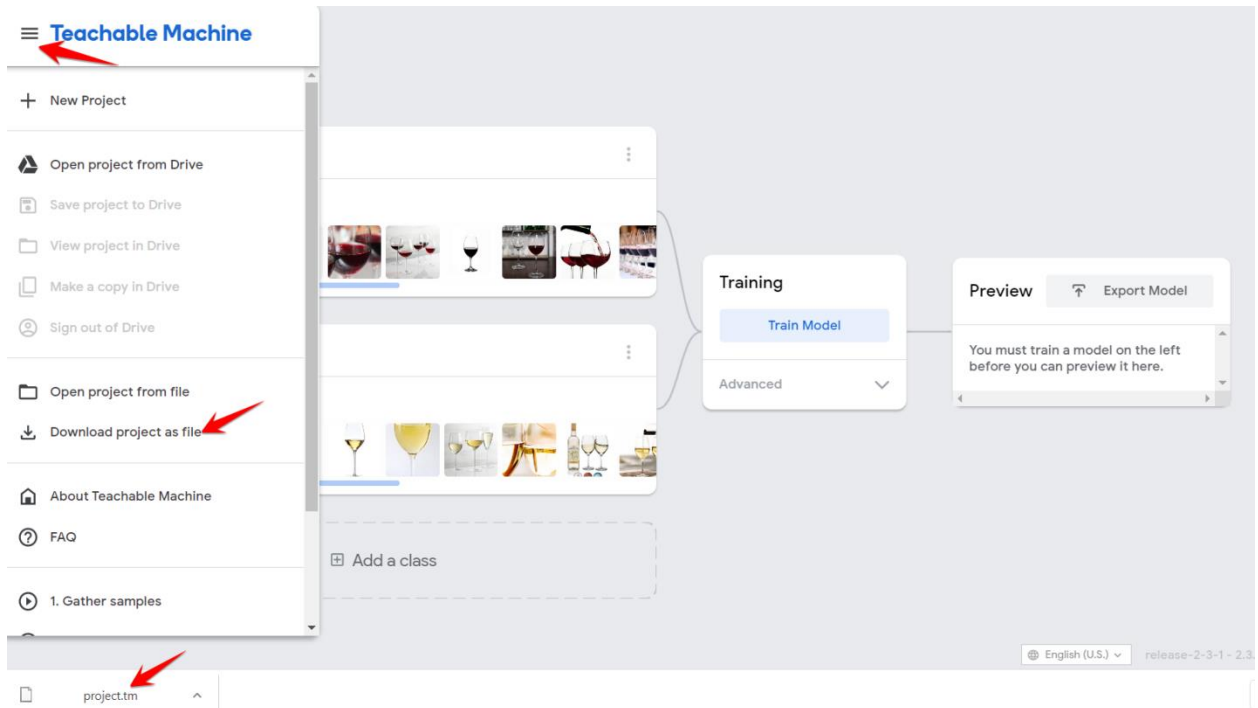
	<b>Need Improvement</b> (0 – 5.0)	<b>Satisfactory</b> (>5.0 - 10.0)	<b>Good</b> (>10.0- 15.0)	<b>Very Good</b> (>15.0 – 20.0)
Formulated Solution (20 marks)	<p>No or few reasons and support to justify the AI solution.</p> <p>Formulation of solutions is superficial with examples/illustrations containing cursory, surface level.</p> <p>Incomplete explanation and lacking many of the following: Important information to solve the problem, detailed development process and reviews logic/reasoning, examines the feasibility of the solution</p>	<p>Some relevant reasons and support to justify the AI solution.</p> <p>Formulation of the solutions is brief with few examples/illustrations containing explanations that lack of depth.</p> <p>Perhaps noticeably lacking one or more of the following: Important information to solve the problem, detailed development process and reviews logic/reasoning, examines the feasibility of the solution</p>	<p>Good reasons and support to justify the AI solution.</p> <p>Formulation of a solution is adequate with some examples/illustrations containing a thorough explanation.</p> <p>Deeply and thoroughly explain some of the following: Important information to solve the problem, detail development process and reviews logic/reasoning, examines the feasibility of the solution</p>	<p>Excellent reasons and support to justify the AI solution.</p> <p>The formulation of solutions is deep and elegant with examples/illustrations containing thorough and insightful explanations included.</p> <p>Deeply and thoroughly explain all the following: Important information to solve the problem, detail development process and reviews logic/reasoning, examines the feasibility of the solution</p>

	<b>Need Improvement</b> (0 – 5.0)	<b>Satisfactory</b> (>5.0 - 10.0)	<b>Good</b> (>10.0- 15.0)	<b>Very Good</b> (>15.0 – 20.0)
Prototype solution and demonstrate /test the solution (20 marks)	<p>Some or insufficient proposed test cases try to demonstrate how the solution addresses the problem but there is a potential inconsistency between the solution and the problem</p> <p>Solution was not appropriate for the problem.</p>	<p>Some proposed test cases adequately demonstrate how the solution addresses the problem and may not be able to apply to a real-world context</p> <p>Oversimplified approach to the problem.</p>	<p>All proposed test cases adequately demonstrate how the solution addresses the problem and some attempt to consider it within a real-world context</p> <p>Appropriate, effective strategies for solving the problem.</p>	<p>All proposed test cases precisely demonstrate how the solution addresses the problem and take into consideration a real-world context</p> <p>Innovative and insightful strategies for solving the problem.</p>

## Annex B: How to save the projects and links for submission

### Google Teachable Machine

a) Export google teachable machine zip files



Rename the project.tm to your admin number eg. 123456A.tm and submit.

b) Upload model to Cloud and get web link for submission

The first screenshot shows the 'Export Model' button in the top right corner of the interface. The second screenshot shows the 'Export your model' dialog with 'Upload my model' selected. The third screenshot shows the final state with a sharable link and a confirmation message.

**Export your model:**

☒ Upload (shareable link) ☐ Download

**Your sharable link:**

[https://teachablemachine.withgoogle.com/models/\[...\]](https://teachablemachine.withgoogle.com/models/[...])

When you upload your model, Teachable Machine hosts it at this link for free. (FAQ: [Who can use my model?](#))

**Code snippets to use your model:**

[Javascript](#) [p5.js](#) [Contribute on Github](#)

Learn more about how to use the code snippet on [github](#).

`<div>Teachable Machine Image Model</div>  
<button type="button" onclick="init()">Start</button>  
<div id="webcam-container"></div>` [Copy](#)

**Export your model:**

☒ Upload (shareable link) ☐ Download

**Your sharable link:**

<https://teachablemachine.withgoogle.com/models/XCg4mdd5B/> [Copy](#)

When you upload your model, Teachable Machine hosts it at this link for free. (FAQ: [Who can use my model?](#))

✓ Your cloud model is up to date.

Copy the web link into your report.

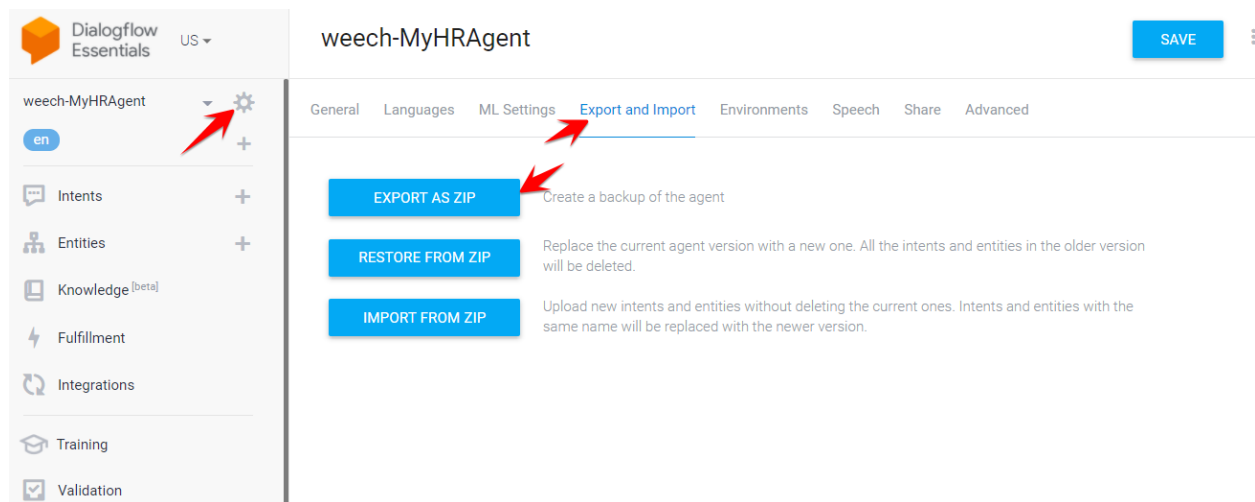


## DialogFlow

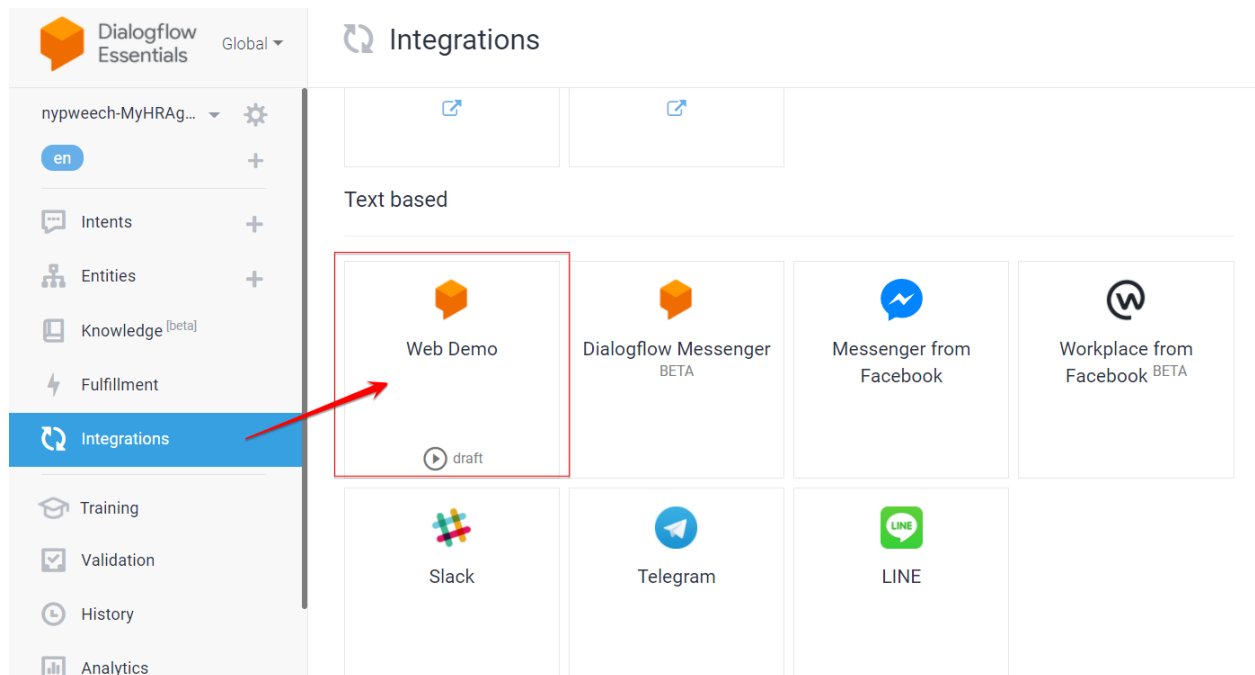
a) Goto your project. Select the setting, select Export and Import, select EXPORT AS ZIP.

Rename the zip to your admin number eg. 123456A.zip.

Submit the ZIP file.



b) Get a web link for submission





## Web Demo

Test the agent on its own page. Share the link to the page or embed the widget in other websites to get more conversations going. [More in documentation.](#)

<https://bot.dialogflow.com/0a7cdba6-8700-4667-97b8-927fb09a6317>



Seems that your agent info is not filled yet. Set icon and description for better end-user experience.



Add this agent to your website by copying the code below:

```
<iframe
  allow="microphone;"
  width="350"
  height="430"
  src="https://console.dialogflow.com/api-client/demo/embedded/0a7cdba6-8700-4667-97b8-927fb09a6317">
</iframe>
```



CLOSE

DISABLE

Copy the web link into you report.

## Annex C: Example of a Problem Scenario

The following is an example of an industry problem

Industry: Education

### Problem Scenario

Goosh is an online eTutor company that supports student learning in Science and Math subjects across Asia regions.

Goosh's support staff comprises two teams of 20 agents: A community support team for handling account inquiries, and remote tutors to handle in-depth questions for specific tests. Goosh uses Zendesk to handle their customer support requests. It has over 900 macros on ZenDesk, which are pre-written, standard responses to common questions asked by the company's customers.

The support staff found it **difficult to search** these macros for offering timely customer help, which they believed to be **negatively affecting their customer satisfaction scores** on responses to customer queries. Part of this searchability problem was the enormous number of macros which took a lot of time to search through and manage. The process to find the macro is inefficient where customers have a long waiting time to get the answer.

### Impact

The staff cannot perform the task well due to the difficulty to search for the macros. In long term, it affects the morale of the staff and they may quit the job. This will affect the business operation.

When customers or learners face some issues but cannot get online support, it will result in an unsatisfactory customer. This group of customers will not continue with the program. Eventually, the company will suffer a loss of revenue and reputation.

=====End of the Assignment=====