## Coursework Documentation Template

## 1- About this submission

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| Student Name |  |
| Student ID |  |
| Chatbot Topic | Artwork and artist information- ArtBot |
| Tasks implemented in this submission (a,b,c,or d) | a, b, c |
| Files inventory (excluding this file) | main.py - Main code for chatbot  Image\_Classification.ipynb - Machine Learning model for image classification  Conversation.csv - sample conversation QA  Kb.csv - Knowledge base file |
| Demo video URL |  |
| Checklist | I will submit this file separately (without compression) into DropBox  All other files are zipped and will be submitted into DropBox  The demo video is recorded as instructed, and the sharing link is inserted above  I have made sure that the demo video is shared according to the instructions, so that I allowed everybody in the university to view it.  All the sections below are populated accordingly. |

## 2- Design notes (shrink/grow as needed, add images where applicable)

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| General explanations of the system and its goals | ArtBot – the chatbot for providing information about art. The chatbot does conversation with the user and provide information about famous artwork, artist, various genres of art, art movements and history. The chatbot remembers art related facts and check the facts as well. There is one more functionality added to the chatbot where the artwork image is selected from local computer and the chatbot identifies which artist created that artwork.  The goal of this chatbot is to give any information related to art to the user, whether it is about any artwork or any art exhibitions happening around the world. |
| The system requirements, i.e., the list of what the system should do/have from a user’s perspective | The system requirements are that the system should have python installed including libraries such as pandas, nltk and tensorflow and the user can run main.py file to interact with the chatbot.  The chatbot will greet the user in starting and can answer any questions of users. It can also suggest options based on its functionality like answering the questions, checking and remembering facts and identifying artist for any artwork. The chatbot will stop when the user will type “Bye”. |
| The employed AI techniques, and the explanation of program codes and the supplied files. | The main functionalities of the chatbot include TF-IDF transformation and cosine similarity of sentences, First Order Logic from knowledgebase, and multiclass image classification using machine learning.  The main function contains the while loop where the user interacts with bot and input various questions so that the bot can answer them. These are the functionalities included in the chatbot which help the chatbot answer to the questions.   1. First, one sample conversation csv file is read, and the questions are lemmatised to find the root form of the words, transformed into TF-IDF and using cosine similarity the question asked by the user are related to the already present conversation. 2. First order logic is implemented next. In this, one knowledgebase file is created using nltk format and converted into a list. Then the fact written by the user is first converted into the readable format and compared with the already present facts. If the fact is already present in the knowledgebase, message is displayed that the fact is already present. If the fact is not present, it is added to the knowledgebase and if the fact contradicts the already present fact, message is displayed accordingly. Same goes for checking the facts from knowledgebase. This will display whether the fact is correct or incorrect. 3. Third functionality includes image classification. The dataset of artwork and their respective artists is taken from Kaggle. The dataset is augmentated so that the dataset is increased and can be fitted to the model. Deep learning model is used for classifying the images. Pretrained ResNet model is used to train with 20 epoch using Adam optimizer. The trained model is then evaluated, and it achieves 85% accuracy. This trained model is saved in .h5 format. 4. The image of artwork is selected from local computer using tkinter library, where a new window is opened and after selecting the image, the Machine Learning model is loaded, and it will predict the artist who created the selected artwork. This window can be closed from the close button in tkinter.   Below screenshot demostrates the functionality of step 4.    This tab closes the chatbot and user can again type in the chatbot. |

## 3- Conversation log (insert text, screenshots and/or images as required)

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(no word count is necessary)