Criteria B

1) Record of Tasks

2) Decomposition Diagram 2

3) Use-Case Diagram 2

4) GUI Designs (Currently includes a lot of features that may not be implemented) 3

5) Evidence of Algorithmic Thinking: 4

6) Flowchart 4

7) Pseudocode 7

8) UML Class Diagram 10

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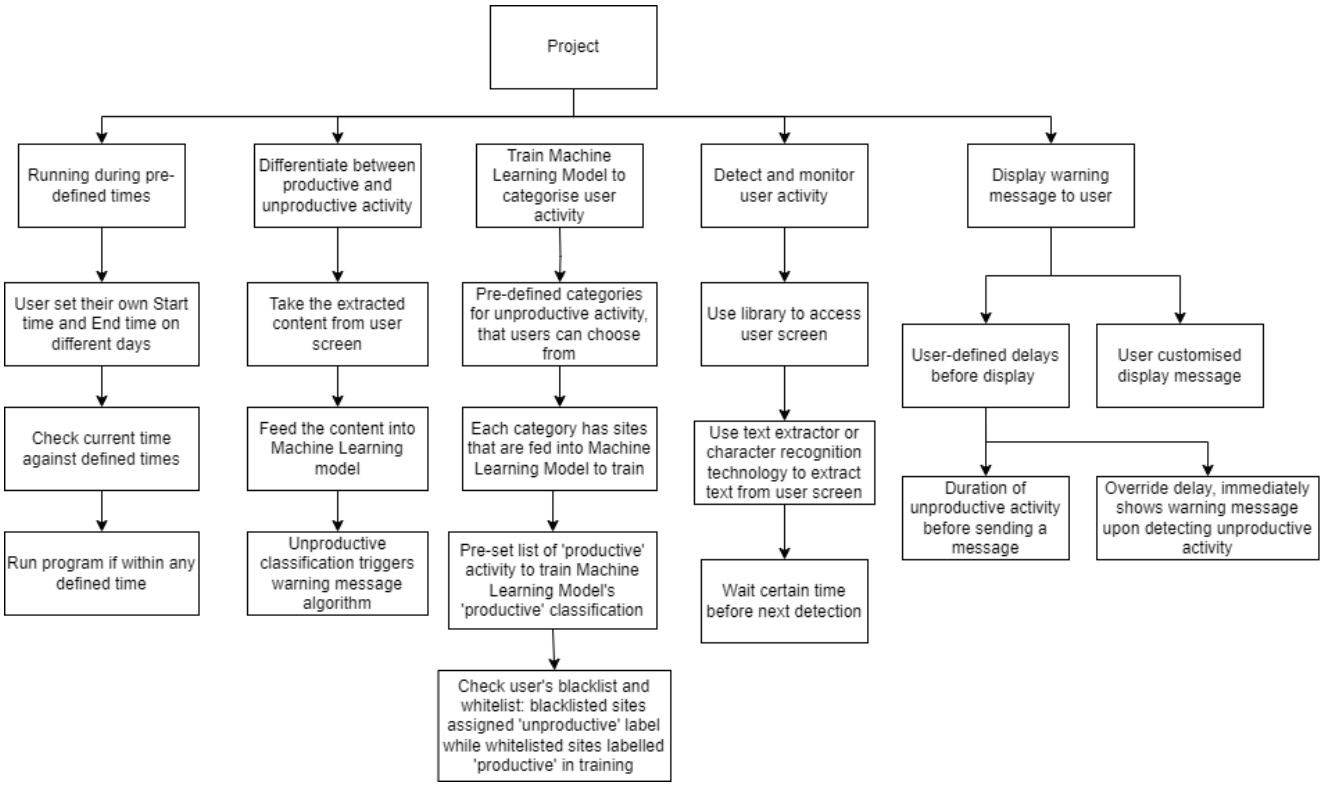
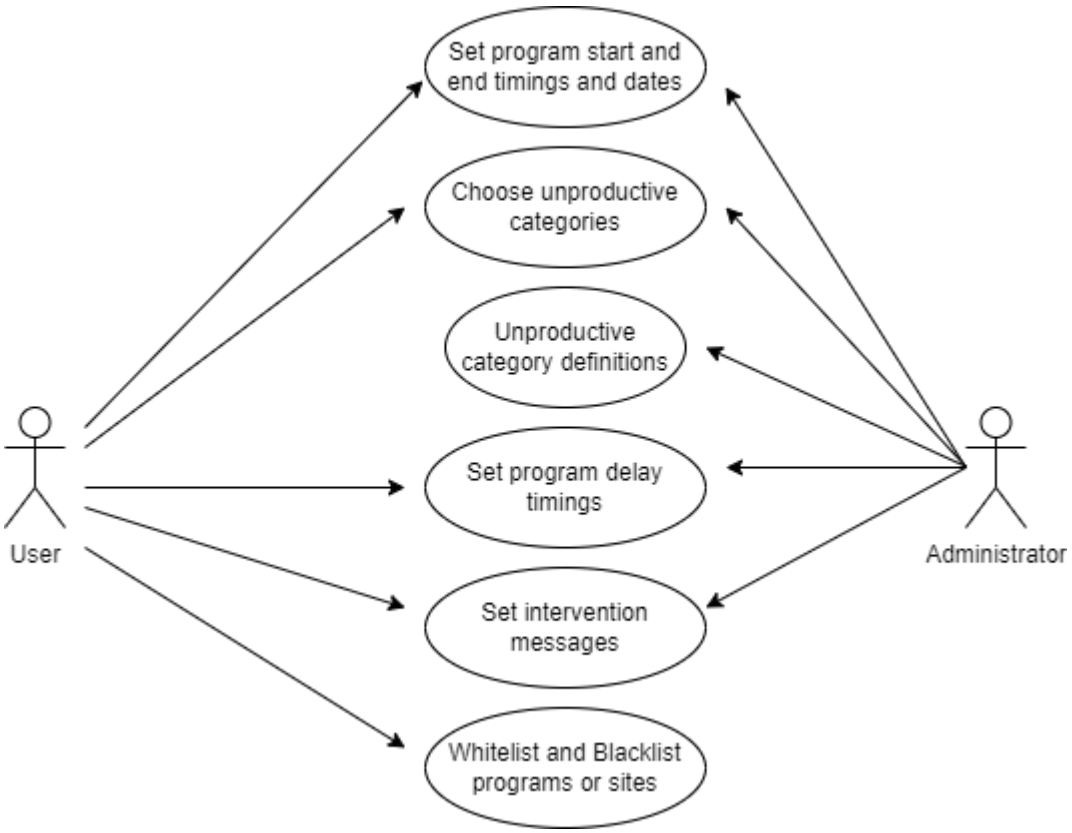
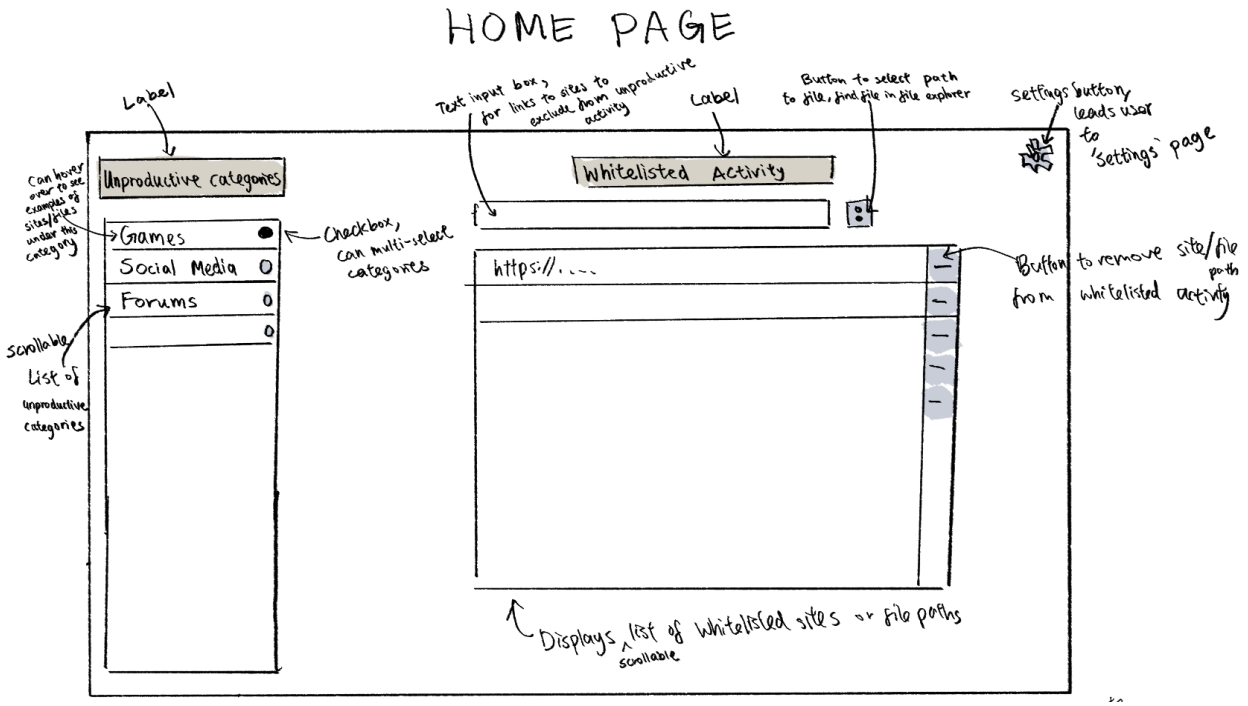
2) Decomposition Diagram

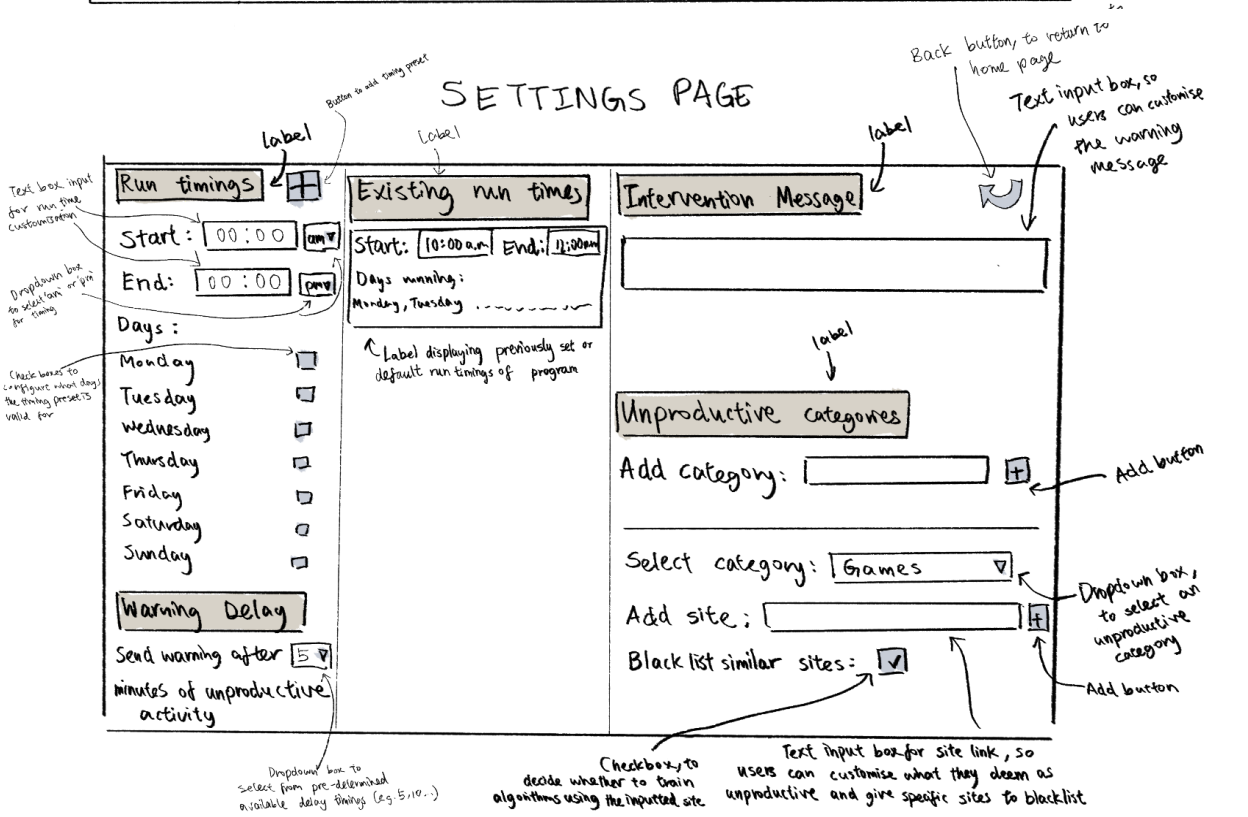


3) Use-Case Diagram



4) GUI Designs

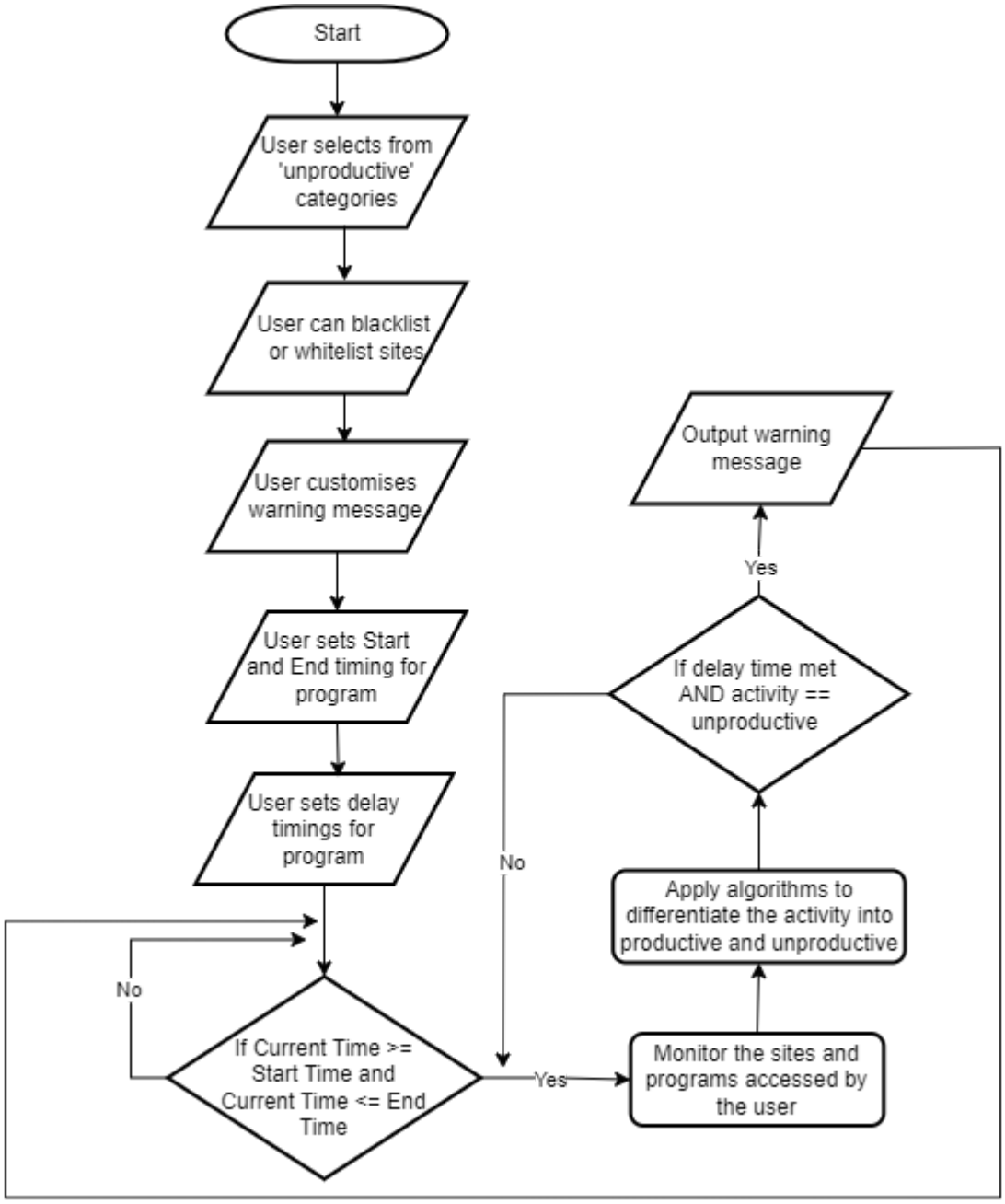




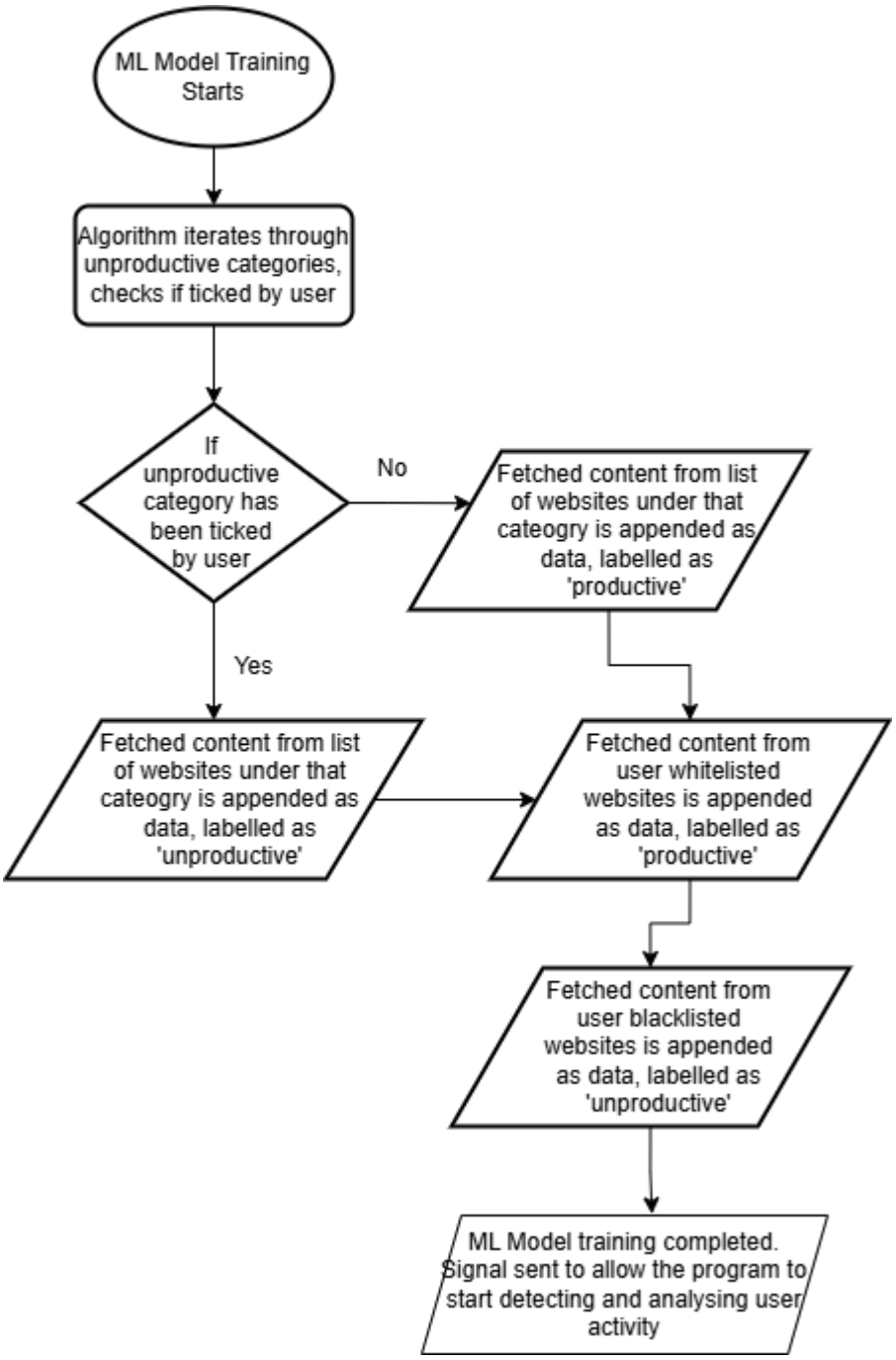
5) Evidence of Algorithmic Thinking:

6) Flowchart

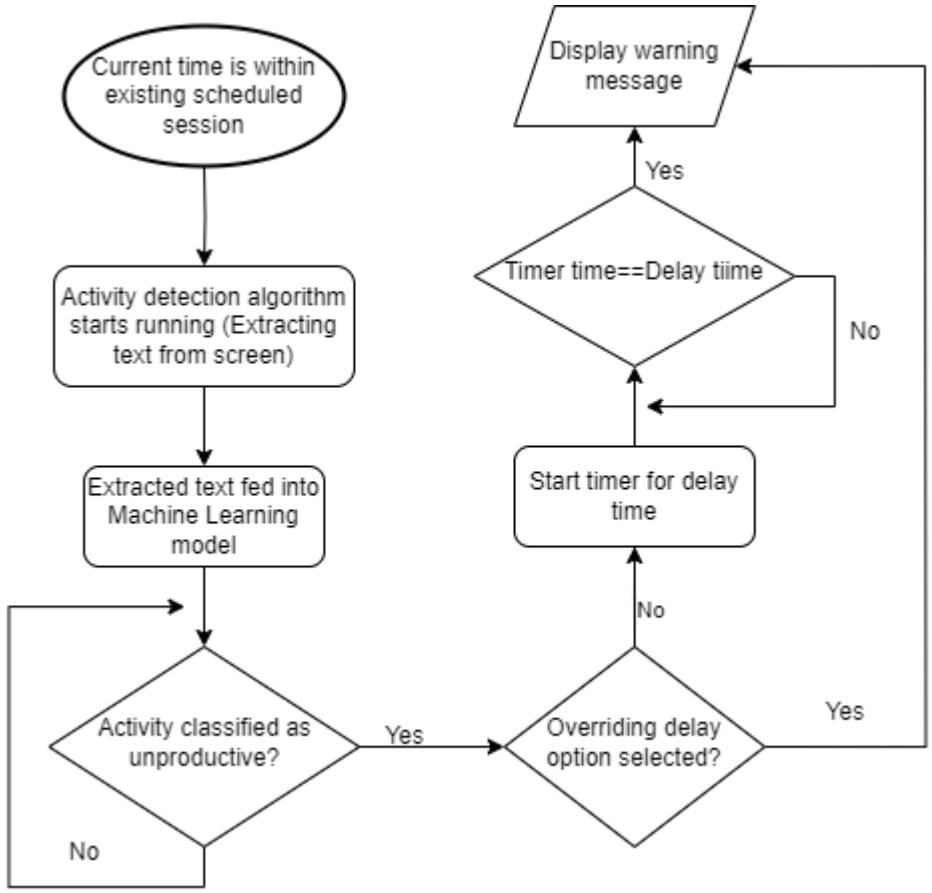
[Success Criteria 1, 2, 3, 4, 5, 6, 7, 8]



Training Machine Learning Model:
[Success Criteria 1, 2]



Flow from activity detection to displaying warning:
[Success Criteria 1, 4, 6, 8]



7) Pseudocode

Activity detection:
[Success Criteria 1, 4, 6, 8]

```
Function DetectUnproductiveActivity:
    If not currently_in_session or not model_trained:
        Print "Will not proceed with activity detection."
        Return

    Capture screen to screen_image
    Extract text from screen_image to screen_text

    If screen_text is not empty:
        Print "Extracted text from screen"
        Set unproductive_flag by predicting unproductive(screen_text)

        If unproductive_flag:
            If override_delay is enabled:
                Display warning message immediately
            Else:
                If unproductive_timer is not valid:
                    Start unproductive_timer
                Else If unproductive_timer elapsed >= wait_time:
                    Display warning message
                    Invalidate unproductive_timer
                Else:
                    Print remaining time
        Else:
            Reset unproductive_flag and unproductive_timer
    Else:
        Print "No text detected on screen"
```

Training Machine Learning Model:

[Success Criteria 1]

```
Function TrainModel:
    Initialize data and labels lists

    For each category in categories:
        If category is selected:
            For each site in category:
                Fetch content from GivenSite
                If content exists:
                    Add content to data
                    Add "unproductive" to labels
        Else:
            For each GivenSite in category:
                Fetch content from GivenSite
                If content exists:
                    Add content to data
                    Add "productive" to labels

    For each site in whitelisted_sites:
        Fetch content from site:
        If content exists:
            Add content to data
            Add "productive" to labels

    For each site in blacklisted_sites:
        Fetch content from site:
        If content exists:
            Add content to data
            Add "unproductive" to labels

    For each site in productive_sites:
        Fetch content from site:
        If content exists:
            Add content to data
            Add "productive" to labels

    Fit vectorizer with data
    Fit model with transformed data and labels
```

Classifying activity content:

[Success Criteria 1]

```
Function classifyContent(image):
    text = extractText(image)
    If text is not empty:
        features = transformTextToFeatures(text)
        prediction = predictProductivity(features)
        Return prediction
    Else:
        Return False

Function extractText(image):
    Use OCR to extract text from image
    Return extracted text

Function transformTextToFeatures(text):
    Convert text to numerical features using vectorizer
    Return features

Function predictProductivity(features):
    Use trained model to predict if features are unproductive
    Return prediction
```

Session checking:

[Success Criteria 4, 8]

```
Function checkSessions():
    Get current time and day
    Set InSession to False

    For each session in sessions:
        Get start and end time
        If current day is in session's days:
            If session spans midnight:
                If current time is after start or before end:
                    Set InSession to True
                    Break
            Else:
                If current time is between start and end:
                    Set InSession to True
                    Break

    Update currently_in_session based on inSession
```

Settings loading/writing:

[Success Criteria 9]

Function loadSettings():

Try to open settings file:

Load settings into a dictionary

Convert session times from strings to QTime objects

Return settings

If file not found:

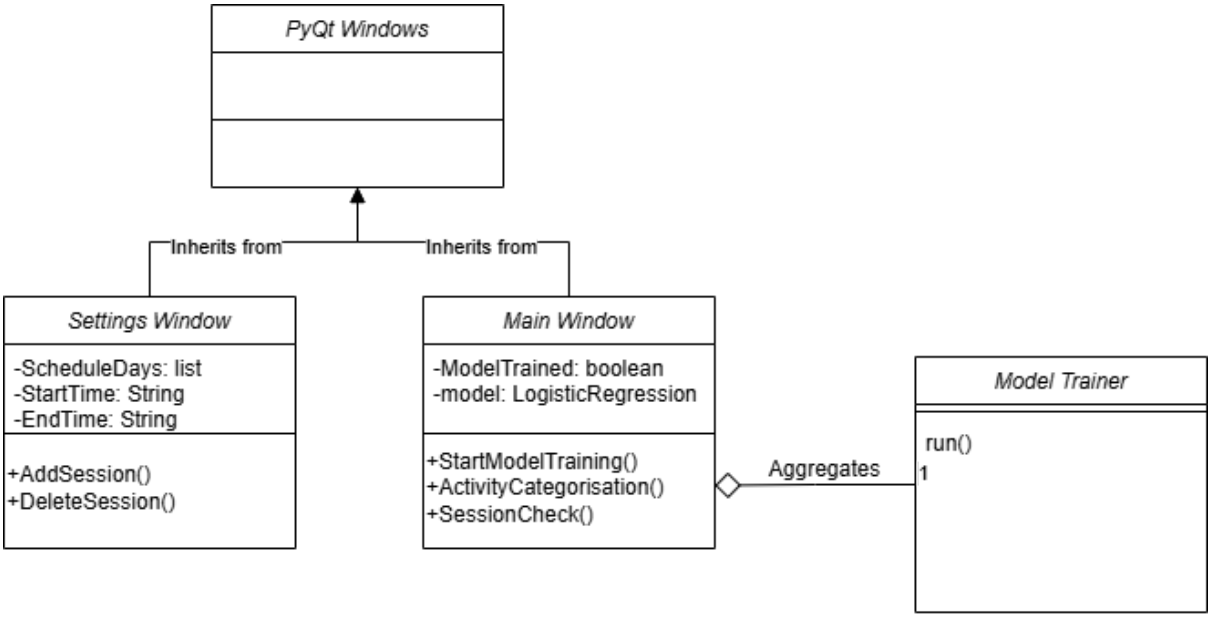
Return default settings

Function saveSettings(settings):

Convert QTime objects in settings to strings

Write settings to the settings file

8) UML Class Diagram



9) Data Structures Table

Variables	Data Type	Explanation + Validation
Categories	List[Category]	A list of Category objects defining the types of activities to differentiate as unproductive. Each element must be an instance of a subclass of Category.
Schedule	Dict[str, Tuple[time, time]]	A dictionary mapping days of the week to tuples of start and end times. Keys must be strings representing days of the week (e.g., "Monday"). Values must be tuples containing two time objects. Example: {"Monday": (time(9, 0), time(17, 0))}. time(9, 0) is an instance of the time class from Python's datetime module. time(9, 0) represents 9:00 AM.
delayPeriod	Integer	The delay period in minutes before the app intervenes. Must be an integer within the range [1, 120]. Example: delayPeriod = 10.
message	String	The customizable intervention message e.g. "Time to get back to your studies!"
log	List[Dict[str, Union[str, datetime]]]	A list of dictionaries, each representing a logged activity with its status and timestamp. Each dictionary must contain keys activity, status, and timestamp. activity: String representing the activity. status: String representing the classification (e.g., "productive" or "unproductive"). timestamp: datetime object representing the time of the activity. Example: log = [{"activity": "facebook.com", "status": "unproductive", "timestamp": datetime.now()}].

10) Test Plan

Success Criteria no.	Test purpose	Data entered	Expected output	Explanation
1	Validate activity classification	- Text from a social media post, social media category selected -Text from a social media post, social media category not selected -A local video game, with the game category selected -A local video game, with the game category not selected	-Classified as unproductive -Classified as productive -Classified as unproductive -Classified as productive	Ensure the program correctly classifies different types of activities, no matter on a browser or a local file.
2	Test category selection functionality	- Select "Social Media" and "Games" categories -Deselect all categories	-Categories added to monitored list -Monitored list should be empty	Ensure users can select and save predefined categories to monitor.
3	Validate setting schedule functionality	- Set schedule to run from 9 AM to 5 PM on weekdays -Delete an existing schedule	- Schedule saved and updated to config file -Schedule deleted on UI and from config file	Ensure the user can customise the date and time that the app runs
4	Verify monitoring of user activity during scheduled run time	-Running program during time within a scheduled run time -Running program outside of schedules run times	-Logging should display ‘monitoring start’ and classification feedback -Logging should display ‘not in schedule’, ‘no prediction activity occurring’	Ensure the app respects the user's specified schedule for monitoring.
5	Verify intervention delay setting	- Set delay period to 10 minutes -Select override delay button	- Delay period saved and interventions occur after 10 minutes of continuous unproductive activity -Override delay set to true in config file, interventions appear immediately upon detection	Ensure the app waits the specified delay period before intervening.

6	Validate intervention message display	-Don’t edit custom message, leave as default - Set custom message "Please return to your studies"	- Default message displayed during intervention - Custom message displayed during intervention	Check if intervention message is being displayed correctly
7	Validate customizable intervention message	-Don’t edit custom message, leave as default - Set custom message "Please return to your studies"	-Default message is saved in config file -Intervention message changed to new custom message in config file	Ensure users can customise intervention messages and they are saved correctly.
8	Program should run in the background, unless user chooses to close it	-Open laptop without opening program -Open program and closing the window	-During scheduled run time, unproductive activity classification is occurring and warning messages appear, respecting user delay options -Program stops. Next time program runs should be if the user opens the program or if the laptop is closed then opened.	Ensure the app runs independently, not relying on user motivation.
9	Program should save user changes and run with updated settings	-Open program without changing any settings -Change selection of categories in unproductive category selection -Add websites to blacklist and whitelists	-The user preference storage file should remain the same -The preference file should update to have the user selected categories under unproductive categories -The preference file should update to have the added websites in the blacklist or whitelist	To ensure the users can customise the program and their changes are saved.