Final Project (20%) Due on May5 /2025 CSC237-04 Spring 2025

You are going to create a Museum final project.
Here is the System Requirement Specification

Your Museum has the following classes:

ArtWork: abstract

- artist: Name
- created: Date
- acquired: Date
- donatedBy: Name
- description: string
- toString(): string - abstract method to return all information about the artwork
- value(): double - abstract method to calculate the value of the artwork

Your museum must have several instances of ArtWork with **at least 3** of the following subclasses: (i.e. Painting, Sculpture, and Dance!!)

- Painting
  - medium (enum: oil, acrylic, mixed media, watercolor)
  - dimensions: Dimensions **(width: double, height:double)**
  - <u>numberOfPaintings: static int</u>
  - value(): double = age in years * area in square feet

- Sculpture
  - medium (enum: ceramic, stone, metal, mixed media)
  - dimensions: Dimensions **(width: double, height:double, depth: double)**
  - weight: double (kg)
  - <u>numberOfSculptures: static int</u>
  - value(): double = age (in years) * weight (in 100 lbs) (i.e. if an item weighs only 2 lbs it is worth a lot less than an item that weighs 100 lbs)
- WrittenWord
  - genre (enum: Novel, Biography, Anthology, Illustrated, Autobiography, Nonfiction, Poetry)
  - numPages: int
  - value(): double = age (in years) * (number of pages/100)
  - <u>numberOfWrittenWordItems: static int</u>
- Film
  - genre (enum: Documentary, Anime, Animation, Drama, Comedy, Fantasy, etc.)
  - length: Time
  - medium (enum: 8mm, 16mm, video, digital)
  - value(): double = age (in years) * (time (inHours)/60)
  - <u>numberOfFilms: static int</u>

- Music
    performedBy: string
    Length:Time
    recordingMedium: (enum: tape, digital, paper, etc)
    genre (enum: Classical, Baroque, Folk, Traditional, Rock, Metal, HipHop, Broadway Musical, Symphony, opera, etc.)
    numberofMusicItems: static int
    value(): double = age (in years) * (time (In Hours)/60)
- Dance
    performedBy: string
    length: Time
    numberOfDanceItems: static int
    value(): double = age(in years) * time(InHours) / 60

- Create UMLs for all the classes - including Name, Date, Dimensions, and Time Name, Date, Dimensions, and Time may be structures if that works for your project, but they still need UMLs).
- value is US Dollars (Format: $xxx.xx)
- Your classes must overload the stream output operator
- Every class has a value() method that calculates the value of the artwork based on the age of the artwork (date) and other factors. See definition of the class above.
- Every class must overload the comparison operators (==, !=, <, >, <=, >=) to compare items based on value.
- Create a **template** to find the minimum value; use the template to find the minimum value of an array of artwork in your museum
- Create a **template** to find the maximum value; use the template to find the maximum value of an array of artwork in your museum
- Your project must have a function in your Museum file (driver program) that demonstrates polymorphism (something that acts on Artwork but effectively displays the subclass information)
- Your classes must throw exceptions for invalid inputs, and catch and handle those exceptions appropriately
- You must be able to write information from your Museum (driver program) to a text file. (it would be appropriate to write the contents of your museum as an "inventory" or "catalog".)
- You must include a README.MD file that documents where to find: overloaded stream & comparison operators, templates, polymorphism demonstration(s), exceptions and exception handling

    ➔ Don't forget to COMMENT EXTENSIVELY and document your methods!
    ➔ Use self-documenting method names and variables
    ➔ if you allocate a dynamic memory using pointer, you'd better remember to delete it!