# GAME MECHANICS-1

COMPUTER NETWORKING

**Time:** 60 mins

## Introduction

In this class, the student/s will create the game login screen for players to connect and join the game server.

## New Commands Introduced

- Image.open(): Opens an image file and stores it in a variable.
- Image.resize(): Resizes the image to the specified width and height.
- Canvas.create_image(): Adds an image to the canvas at the specified location.
- Canvas.create_text(): Adds a text label on the canvas at the specified location and in the specified color.

## Vocabulary

- **Canvas** is a rectangular area intended for drawing pictures or other complex layouts.
- **Responsive** design refers to design that adapts to different screen sizes, orientations, layouts, and platforms.

## Learning Objectives

Student/s should be able to:

- ***Recall*** how to send and receive messages between client and server.
- ***Explain*** how to use the imaging library to add and resize images and text on the canvas.
- ***Demonstrate*** the creation of a game login screen and players joining the game server.

## Activities

1. **Class Narrative:** *(3 mins)*
    - Brief the student/s that they would display the game login screen and write socket commands for players to join the game server.
2. **Concept Introduction Activity:** *(4 mins)*

- Let the student/s undertake the explore-activity to observe the game login screen of the ludo ladder game.
- Using the slides, explain that the student/s will learn:
    - to create the game canvas
    - to resize the game canvas
    - to save the player's information on server

3. **Activity 1: Create the Game Canvas** *(14 mins)*

    **Teacher Activity:** *(7 mins)*

- Explore and identify the different elements needed on the game login screen.
- Inform the student/s that the code to create the basic Tkinter window is already done.
- Introduce students to the Python Imaging Library(Pillow) to add image and text to the canvas.
- Demonstrate how to create a canvas on the Tkinter window.
- Demonstrate how to add an image and text to the canvas at specific locations.

    **Student Activity:** *(7 mins)*

- Guide the student/s to create the canvas on the Tkinter window and load an image and the text on it.

4. **Activity 2: Resize the Game Canvas** *(12 mins)*

    **Teacher Activity:** *(6 mins)* .

- Introduce the student/s to the issues in the current login screen i.e. the size of the canvas, image and text remains the same irrespective of the size of the screen or the Tkinter window.
- Recall how designs can be made responsive as done in the Web Development module.
- Demonstrate how to resize the canvas, image and font size of the text on the canvas using screen width and height.

    **Student Activity:** *(6 mins)*

- Guide the student/s to fetch and store the screen width and height, and resize the canvas and its elements as per the size of the screen.

5. **Activity 3: Save Players' Information** *(12 mins)*

    **Teacher Activity:** *(6 mins)*

- Recall code to send and receive messages between server and client using socket programming.
- Demonstrate how to send the player name to the server and store the player and socket information on the server.

  **Student Activity:** *(6 mins)*

- Guide the students to receive the player name and socket details from the client and store it on the server.

6. **Introduce the Post class project:** *(2 min)*
   - Create the game login screen of the tambola game.
7. **Test and Summarize the class learnings:** *(5 mins)*
   - Check for understanding through quizzes and summarize learning after respective activities.
   - Summarize the overall class learning towards the end of the class.
8. **Additional activities:**
   - Encourage the student/s to add a functionality to login more than 2 players for the game.
   - Encourage the student/s to define the maximum limit to add players to 4.
9. **State the Next Class Objective:** *(1 min)*
   - In the next class, student/s will design the game board and define the player movement for the ludo ladder game.

# U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-14, 2-AP-19

| Links Table | | |
|---|---|---|
| **Activity** | **Activity Name** | **Link** |
| Class Presentation | Game Mechanics-1 | https://s3-whjr-curriculum-uploads.whjr.online/4f0b9474-bc2b-45a2-b6fd-97158bd48aea.html |
| Explore Activity | Game Mechanics-1 | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Activity 1 | Create the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS-BP |

| | | |
|---|---|---|
| Teacher Reference: Teacher Activity 1 Solution | Create the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS |
| Student Activity 1 | Create the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Reference: Student Activity 1 Solution | Create the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS |
| Teacher Activity 2 | Resize the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS-BP |
| Teacher Reference: Teacher Activity 2 Solution | Resize the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS |
| Student Activity 2 | Resize the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Reference: Student Activity 2 Solution | Resize the Game Canvas | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS |
| Teacher Activity 3 | Save Players' Information | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS-BP |
| Teacher Reference: Teacher Activity 3 Solution | Save Players' Information | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-TAS |
| Student Activity 3 | Save Players' Information | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Reference: Student Activity 3 Solution | Save Players' Information | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS |
| Student's Additional Activity 1 | Add Players | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Reference: Student's Additional Activity 1 Solution | Add Players | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS |
| Student's Additional Activity 2 | Define Maximum Player Limit | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS-BP |
| Teacher Reference: Student's Additional Activity 2 Solution | Define Maximum Player Limit | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-SAS |
| Post Class Project | TAMBOLA STAGE -1 | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-PCP-BP |
| Teacher Reference: Post Class Project Solution | TAMBOLA STAGE -1 | https://github.com/Tynker-Computer-Networks/TNK-M15-C113-PCP |