# ARTIFICIAL INTELLIGENCE LABORATORY

MINI PROJECT REPORT

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| PROJECT TITLE | Rock-Paper-Scissor AI Game |
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# Rock-Paper-Scissor AI Game

## INTRODUCTION

The Rock-Paper-Scissor AI Game demonstrates the application of Artificial Intelligence in predicting human choices   
through pattern analysis. The game allows the user to play against an AI opponent that learns from previous rounds   
to make smarter choices over time. This project highlights how AI can be applied in decision-making and prediction-based systems.

## PROBLEM STATEMENT

To design an AI-based Rock-Paper-Scissor game where the computer learns from the player’s previous moves   
and predicts the next possible choice, improving its accuracy with each round.

## GOAL

The goal of this project is to develop an intelligent game that uses predictive algorithms to compete with human players   
by analyzing previous inputs and providing an engaging experience.

## THEORETICAL BACKGROUND

This project uses basic AI techniques such as frequency analysis and pattern recognition.   
The algorithm keeps track of the user's past moves and predicts the next move based on probabilities.   
If a player frequently chooses 'rock', the AI anticipates this and chooses 'paper' to win.   
This concept is an example of a reinforcement-based decision model.

## ALGORITHM EXPLANATION WITH EXAMPLE

Step 1: Initialize the score and move counters.  
Step 2: Ask the player for input (rock/paper/scissor).  
Step 3: The AI predicts based on the player’s history.  
Step 4: Determine the winner.  
Step 5: Update the dataset and repeat the process.  
Example: If the user often plays 'rock', the AI learns to choose 'paper' more frequently.

## IMPLEMENTATION AND CODE

import random

def get\_user\_choice():

choices = ['rock', 'paper', 'scissors']

user\_input = input("Enter rock, paper, or scissors: ").lower()

while user\_input not in choices:

print("Invalid input.")

user\_input = input("Enter rock, paper, or scissors: ").lower()

return user\_input

def get\_computer\_choice():

choices = ['rock', 'paper', 'scissors']

return random.choice(choices)

def determine\_winner(user, computer):

if user == computer:

return "It's a tie!"

elif (user == 'rock' and computer == 'scissors') or \

(user == 'scissors' and computer == 'paper') or \

(user == 'paper' and computer == 'rock'):

return "You win!"

else:

return "Computer wins!"

def main():

print("Welcome to Rock, Paper, Scissors!")

user\_choice = get\_user\_choice()

computer\_choice = get\_computer\_choice()

print(f"You chose: {user\_choice}")

print(f"Computer chose: {computer\_choice}")

result = determine\_winner(user\_choice, computer\_choice)

print(result)

if \_\_name\_\_ == "\_\_main\_\_":

main()

## OUTPUT

Welcome to Rock, Paper, Scissors!

Enter rock, paper, or scissors: rock

You chose: rock

Computer chose: scissors

You win!

## RESULTS AND FUTURE ENHANCEMENT

This project successfully demonstrates an AI model capable of predicting and responding to user behavior.   
Future enhancements can include integrating a GUI, using advanced ML algorithms, or adding difficulty levels   
based on user performance.

GitHub Link of the project and report: [Rock--paper-scissor/Rock-Paper-scissor.py at main · crvaishnavivaishnavi-dotcom/Rock--paper-scissor](https://github.com/crvaishnavivaishnavi-dotcom/Rock--paper-scissor/blob/main/Rock-Paper-scissor.py)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## REFERENCES

1. **Multi‑AI competing and winning against humans in iterated Rock‑Paper‑Scissors game** — Lei Wang et al. (2020)  
Link: [https://arxiv.org/abs/2003.06769](https://arxiv.org/abs/2003.06769?utm_source=chatgpt.com)

2. **Human Randomness in the Rock‑Paper‑Scissors Game** — MDPI Applied Sciences (2022)  
Link: [https://www.mdpi.com/2076-3417/12/23/12192](https://www.mdpi.com/2076-3417/12/23/12192?utm_source=chatgpt.com)

3. **Rock‑Paper‑Scissors AI (GitHub repo)** — dmickelson / GitHub  
Link: [https://github.com/dmickelson/Rock-paper-scissors](https://github.com/dmickelson/Rock-paper-scissors?utm_source=chatgpt.com)