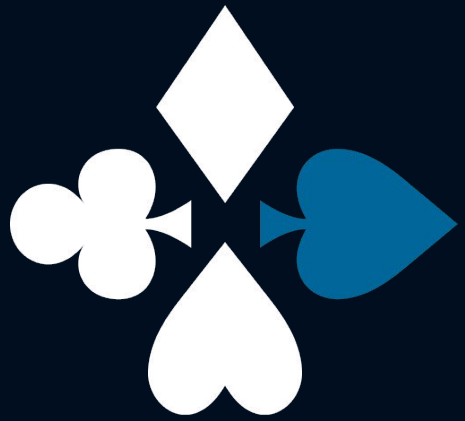


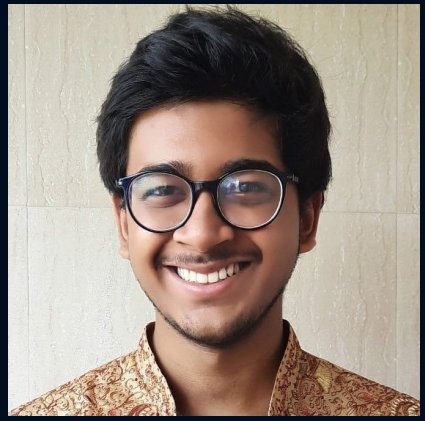
Pokerbots 2025

Lecture 1: Introduction to Pokerbots

Meet the team

Alexander Zhang
Co-President

Jacob Jobraeel
Co-President



Gaurab Das
Vice President

Meet the team

Jacob David

Head Instructor

Meet the team

Sejal Rathi
Engine Lead

Sri Saraf
Server Lead

Paco Gomez-Paz
Engine Developer

Sam Zhou
Tech Lead

Meet the team

Steve Zhang
Sponsorship Director

Bobby Costin
Treasurer

Sponsors

HRT
hudson river trading

Jump
TRADING

VIRTU
FINANCIAL

CITADEL | CITADEL Securities

DRW

MIDPOINT
MARKETS

FIVE RINGS

imc

TREX
QUANT

Jane
Street®

CTC®
CHICAGO TRADING COMPANY®

2σ
TWO SIGMA

SUSQUEHANNA

Register & Resume Drop: pkr.bot/register

Giveaways!

Giveaway Game: pkr.bot/6

- Guess the percent of Course 6s in Pokerbots (from prereg form data)
- You can be as precise as you want, but enter a decimal number
  (eg. 18.26)
- Winner is who guesses the closest (and earliest if there's a tie)
- Prize: Samsung G30D Gaming Monitor

Random Raffle: pkr.bot/random

Prize:

- Sony XM4 Headphones

Agenda

- Class overview + logistical details
- Intro to poker + variant rules
- Skeleton bot setup and connecting to the scrimmage server
- Testing your bot locally
- Overview of skeleton bot architecture
- Live Coding Lecture 1 reference bot

Class Overview + Logistical Details

Resources

- Github: pkr.bot/resources
  - Updated Syllabus (Schedule and all logistical info is here)
  - Lecture slides and recordings, variant info, game rules

- Piazza: pkr.bot/piazza
  - All updates will be posted here
  - Best place to ask questions to staff or classmates

Class Structure

- Twelve lectures
  - MTWR 12:00-1:30pm EST, 6-120
- Recitation and Office hours
  - MTWR 2-4pm EST, 26-168
  - Office Hours virtual on days with no recitation
- Scrimmage server
- Weekly tournaments
- Final tournament and event (Jan 31st)

Team Formation

- Teams are 1-4 people
- Google Sheet: pkr.bot/teammates
- Poker Afternoon Study Breaks!
  - This Wednesday during recitation
  - Play Poker and try out the 2025 Variant!
  - Great place to find teammates
- Team Specific Prizes

>$50K

Total Prize Amount

Prizes

- Grand prize: $10k
- 2nd - 5th place : $6.5k, $3.5k, $2k, $1k
- Bot Language Specific Prizes
- ~$2.5k/week Scrimmage Server Prizes
- All announced prizes can be viewed on the syllabus
- More prizes to be announced soon!

Lecture Series

- Introduction to Pokerbots
- Probability and Statistics
- Poker Strategy
- Game Theory
- Machine Learning
- Reinforcement Learning
- Counterfactual Regret Minimization
- Neural Networks
- Special Topics
- Guest: *GTO Wizard*
- Guest: Noam Brown, *OpenAI*

How to Receive Credit For This Course

Participate

Submit a bot to the scrimmage server every week

Improve

Each week you should beat your bot from the previous week

Report

Submit a 3-5 page strategy report at the end of the competition

Questions?

Intro to Poker + Variant Rules

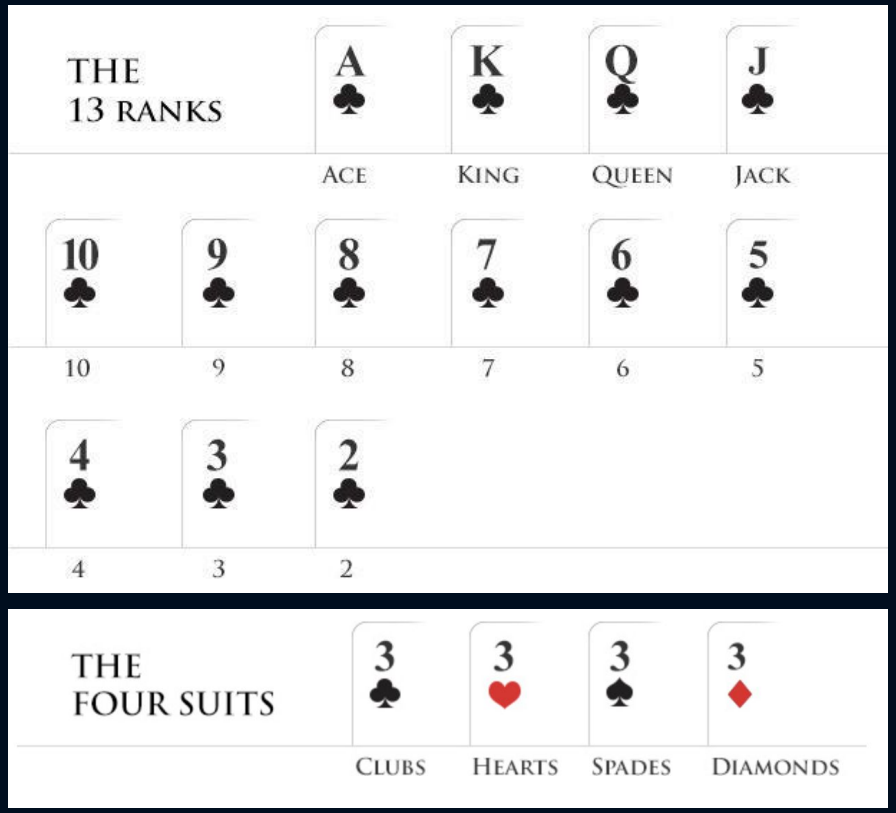
Heads-up No-limit Hold'em Poker Rules

- Objective: earn as many chips as possible
- Players receive two secret cards *(hole cards)*
- Players bet into a pot in several rounds; the pot is given to the player with the best poker hand
- Structure of a betting round: first player can bet 0 (*check*) or any amount between "big blind" and the # of chips they have remaining. If they check, action passes to second player. If they bet, second player can *fold*, *call*, or *raise*
- Hand strength is determined as the best 5-card poker hand you can form out of 7 cards: 2 hole cards and 5 community cards

Poker Rules

- Two cards dealt to each player (*hole cards)*
- Betting round (first betting round begins with *blinds*)
- Flop (3 community cards revealed)
- Betting round
- Turn (+1 community cards revealed [4 total])
- Betting round
- River (+1 community cards revealed [5 total])
- Betting round
- Settlement (*showdown*)

Card Rankings



Poker Hand Strength

Pokerbots Game Iteration

- 1000 rounds
- 400 chip stack, resets each round
- Small/big blinds: 2/1
- Chip profits/losses from all the rounds are totaled to determine winner of match

2025 Variant Reveal

2025 Variant - Bounty Hold'em

Both players are randomly assigned a *bounty rank*, i.e. one of A,2,3,...,K:

- A player hits their bounty whenever the rank appears among one of the cards visible to them (two hole cards and up to 5 community cards)
- If a player wins and hits their bounty, their winnings are increases as follows:

$$[\text{winnings with bounty}] = 1.5 * [\text{normal winnings}] + 10$$

- Bounty ranks are reset every 25 rounds

<u>GOAL:</u>

Take advantage of your bounty cards while trying to deduce your opponent's info!

Detailed rules for the variant will be posted on the class resources page after lecture

Skeleton Bot Setup: Connecting to the Scrimmage Server

Before You Code

Info on Piazza your development environment for Pokerbots

Once finished, make a GitHub account to facilitate code management

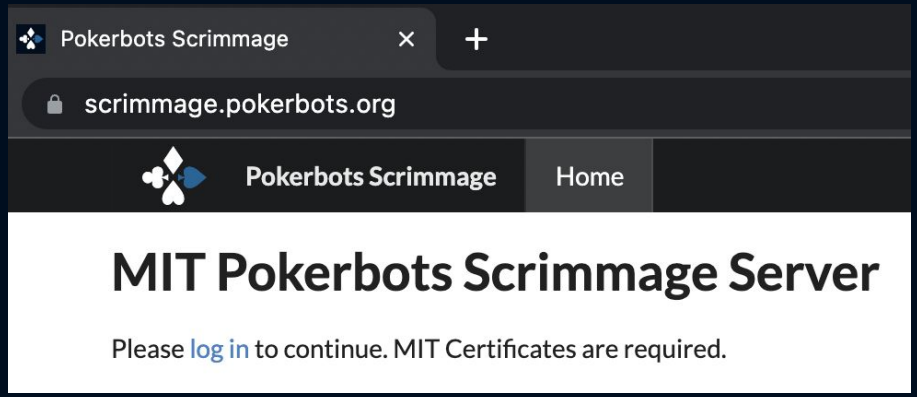
Read up on using the command line and Git

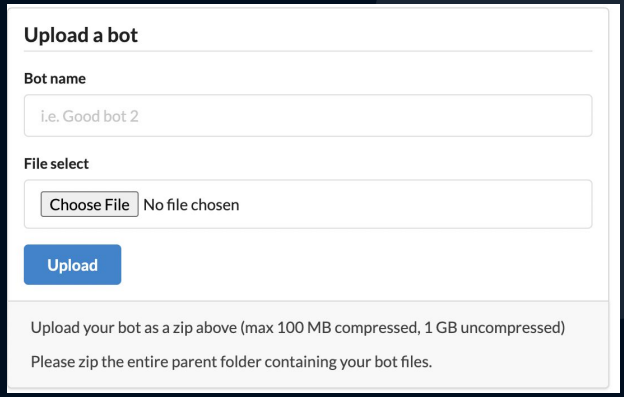
We can help with these steps during recitation/office hours after lecture

Getting Set Up

Clone engine from mitpokerbots/engine-2025; create new repository for your code

Scrimmage server: download ZIP file and upload it directly.

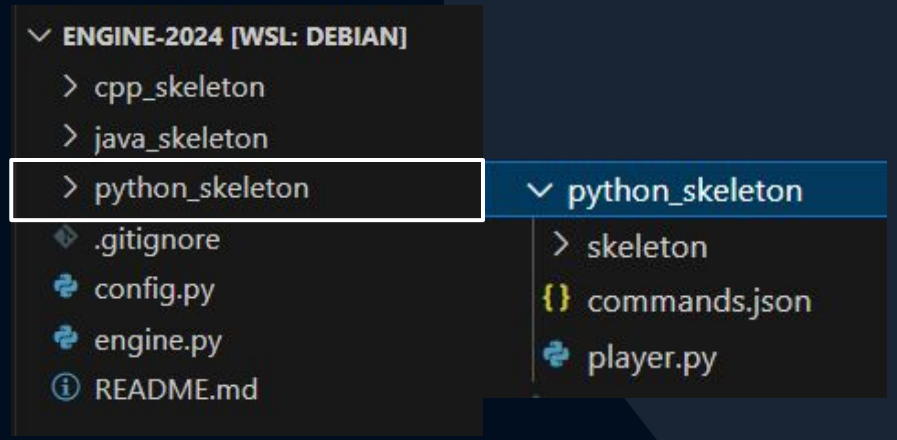




Engine Structure

Engine Structure

- 3 Skeleton directories
  - One for each language
  - Edit code in player.py, Player.java, main.cpp
  - Zip this for the scrimmage server
- engine.py
  - Core engine instructions
  - Run this to test a game
- config.py
  - Parameters for game



Overview of Skeleton Bot Architecture

Skeleton Bot Structure

- GameState, RoundState classes
- handle_new_round(), handle_round_over(), get_action()
- Skeleton Bot walkthrough

Coding reference-1-2025 bot

Example Bot

- We want to analyze our hole cards
- We want to raise the stakes if we hit our bounty
- Eventual goal: use a more advanced method to place a bid combined with more sophisticated betting logic

Lunch 😋

- To get lunch, just show proof that you submitted your resume at pkr.bot/register

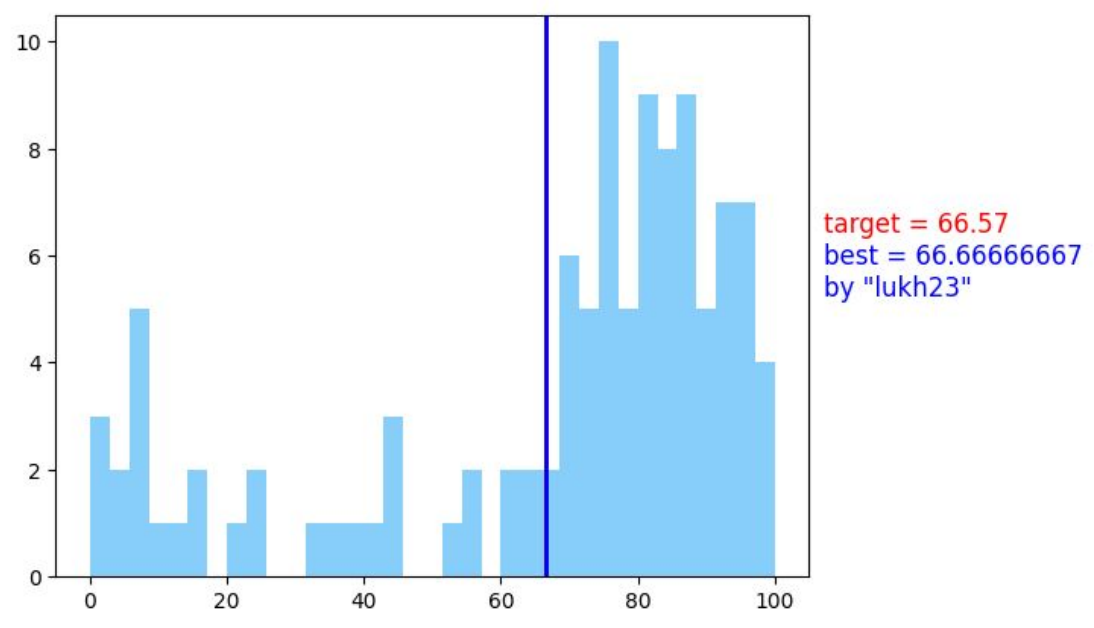
Live Coding Session

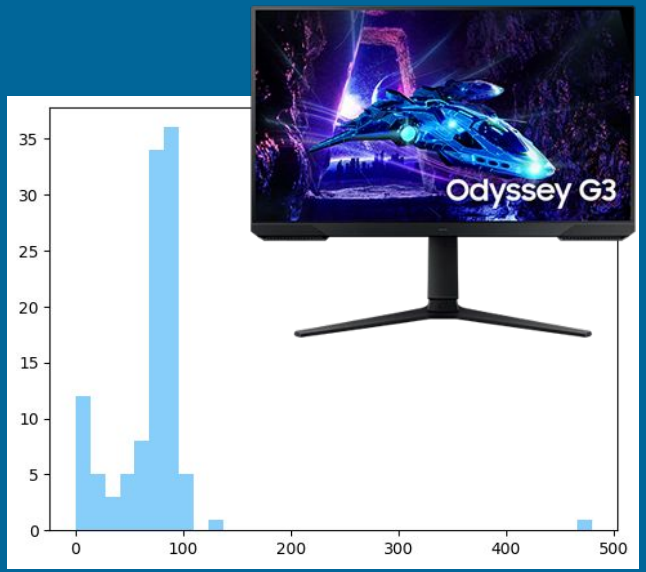
All code from today can be found at:

github.com/mitpokerbots/reference-1-2025

Giveaway Winners

Course 6 Guessing Game





Raffle Winner: kerb “cynth849”

Thanks for watching!

Slides/notes will be posted on **pkr.bot/resources**

Make sure to check **pkr.bot/piazza** for updates

Lecture recordings at **pkr.bot/panopto**

Leave feedback at **pkr.bot/feedback**!