UCD Michael Smurfit
Graduate Business School

Department of Management Information Systems
MSc Business Analytics

PROGRAMMING FOR ANALYTICS - **MIS41110**

BINGO GAME SIMULATION

Presented by: GROUP 11

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Project Contribution by Team Members

STUDENT NAME	STUDENT ID	PROJECT CONTRIBUTION
Nikunj Mehta	23200010	• Card Generation • Simulation Execution • Bingo Card PDF generation
Vaishnavi Raghavan	23201053	• Graphical User Interface • Simulation calculations and Plotting • Centrality measures
Megha Dewangan	23200042	• PDF Report • UML Diagram • User Guidlines
Emelin Elizabeth Mathew	23200175	• Code Review • Quality testing

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USER MANUAL

Data Input:

The program takes 2 inputs in the GUI:

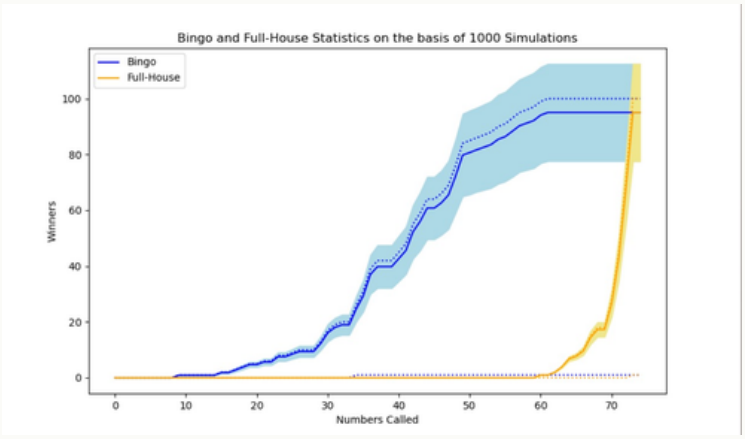
- Number of Cards to Generate
- Number of Simulations to Run

Graphical User Interface window:

Data Output:

The graphical user interface (GUI) has three buttons: "Start Simulation" "Generate Cards" and "Quit", each of which will do the following:

- Line Plot and Centrality Measures
- PDF Version of Cards Generated in the default pdf reader
- Close the window



Your Bingo Card number 1:

13	21	32	59	67
5	24	40	47	74
14	25	X	57	70
9	23	36	50	63
7	17	31	56	61

****** Centrality measures table for BINGO ******

	Number Called	Median	25th Percentile	75th Percentile	Skewness	Excess Kurtosis
0	1	1.0	0.0	1.0	-0.771744	-1.404412
1	2	2.0	0.0	2.0	-0.581416	-1.558885
2	3	3.0	0.0	3.0	-0.492980	-1.681889
3	4	4.0	0.0	4.0	-0.457420	-1.740466
4	5	4.0	0.0	5.0	-0.355194	-1.723437

****** Centrality measures table FOR FULL-HOUSE ******

	Number Called	Median	25th Percentile	75th Percentile	Skewness	Excess Kurtosis
0	1	0.0	0.0	0.0	5.876002	32.527397
1	2	0.0	0.0	0.0	5.876002	32.527397
2	3	0.0	0.0	0.0	5.145927	25.937165
3	4	0.0	0.0	0.0	5.415655	28.502499
4	5	0.0	0.0	0.0	5.226254	26.575533

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User Guideline:

Execute Group11.py file in the terminal.

GUI Window opens up:

- After executing the file, a graphical user interface (GUI) window should appear on your screen.

Enter the data input:

- Within the GUI window, there should be fields or sections where you can input the necessary data for the simulation. Follow any on-screen instructions or labels to provide the required information.

Click on Start Simulation Button:

- Once you have entered the required data, look for a "Start Simulation" button within the GUI and click on it. This will initiate the simulation process.

Line Plot window pops up:

- As the simulation progresses, a new window displaying a line plot should appear on your screen. This plot likely represents some aspect of the simulation results.

Centrality measures displayed in the terminal as a table:

- Simultaneously, check the terminal or command prompt where you initially executed the script. You should see a table displaying centrality measures related to the simulation.

Click on Show Cards Button:

- Within the GUI, look for a "Show Cards" button and click on it.

View Generated Bingo Cards PDF Version:

- After clicking the "Show Cards" button, a PDF version of the Bingo cards generated is prompted to open in your default pdf reader.

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Functions in Python Code:

- *create_bingo_card()*: This function generates a bingo card using random number for each column.
- *write_bingo_card_to_pdf()*: This function writes bingo cards to pdf file using fpdf library.
- *is_bingo():* This function checks if bingo has occurred in the given or generated card.
- *is_fullhouse():* This function checks if a full house has occurred in the given bingo card.
- *simulate_bingo_game():* This function simulates a bingo game for a given card and sequence of the called numbers and later updates it to the bingo_tracker.
- *simulate_fullhouse_game():* This function simulates full house game for a given card and sequence of the called numbers and later updates it to the fullhouse_tracker.

Warnings:

- **Input Constraints**: Use only integer values for input. Non-integer inputs may lead to errors.
- **Sequence Reminder**: Prioritize clicking "Start Simulation" before "Show Cards" to ensure proper execution.
- **Processing Time Alert**: If the simulation count exceeds 10,000, expect a processing time of over 2 minutes.
- **PDF Handling**: Close any generated PDFs before starting a new simulation to prevent conflicts.

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UML ACTIVITY DIAGRAM