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	Study Protocol / Research Protocol	UREC Form No.	10
		Version No.	1

<p>(1) Program / Project Title</p> <p>Project Title – A-MAZE US: PERFECT MAZE GENERATOR USING DEPTH-FIRST ALGORITHM</p>
<p>(2) Program/Project Proponent</p> <p>Project Leader – David Estrella (program, source code)</p> <p>Project Designer – Jovielette Orlanda (flowchart)</p> <p>Technical Writer – Alleina Abad (research protocol)</p> <p>UI/UX Designer – Alijah Andres (logo, powerpoint)</p> <p>System Analyst – Joshua Mateo (research protocol)</p> <p>Business Analyst – Eden Inovejas (pseudocode)</p>
<p>(3) Program/Project Co-proponent and Research Assistant/s</p> <p>Ms. Angie Payne MSIT, MCP</p>
<p>(4) Program/Project Proponent’s Department/College/Office</p> <p>College of Computer and Information Sciences</p>
<p>(5) Background and Significance</p> <p>Justification or rationale for doing the research. This will include a brief introduction, the problem/need being addressed, the historical basis for R&D, utilization of the expected output, socioeconomic benefits, and the possible impact on health / allied health science, the users, beneficiaries, and country.</p> <p>A maze is a tour puzzle consisting of a complex system of paths. A solver's aim is to move from the starting point to the end point of the path. Mazes can be found in the video game industry wherein there is a demand for random creation of interior and/or exterior environments. For example, in case of creating an interior ground plan, maze cells can be mapped into rooms and maze paths into doors. Due to its variously branched passages, mazes are also often used in psychological experiments to study spatial navigation and learning on rats or mice. It is also tradition to build life size mazes as tourist attractions in some countries (e.g. USA). As you can see, mazes have been applied more and more often within real life, which brought up the need for maze generation algorithms. Our research aims to use maze generation algorithms to automatically create a perfect maze. According to Bellot et. Al in 2021, a Perfect maze is defined as a maze that satisfies these two conditions: all cells are part of a unique connected space and no cyclic path is allowed in its construction. These two constraints imply that for every couple of cells there is one and only one path that connects them. In order to remove bias, the researchers also set the algorithm to choose the entry and exit points that have the longest paths. With this in mind, this research would be beneficial for future studies that require repeated random maze generation, such as rat-in-maze experiments and AI maze-solving tests.</p>
<p>(6) Aims / Objectives / Hypotheses</p>

	PUP-UNIVERSITY RESEARCH ETHICS CENTER		
	Study Protocol / Research Protocol	UREC Form No.	10
		Version No.	1

<p>Provide a clear and concise statement of primary and secondary objectives and a clearly defined hypothesis (where relevant)</p> <p>Use the Iterative Depth-first Search (DFS) algorithm to repeatedly generate a perfect maze. A perfect maze satisfies these three conditions:</p> <ol style="list-style-type: none">1. all cells are part of a unique connected space2. no cyclic path is allowed in its construction3. the chosen entry and exit is the longest path in the maze
<p>Materials and Methods</p> <p>N/A</p>
<p>(7) Improvements</p> <p>These are the adjustments done to improve its functionality, visuals, speed, and overall user experience. These enhancements may include bug patches, enhanced design, increased performance, and other features that make the program more engaging and entertaining for users.</p> <ul style="list-style-type: none">• Fixed minor graphical glitches.• Generated mazes can now be exported as a PNG file.• Improved speed when it comes to generating the maze.• Added start and finish nodes.
<p>(8) Safety and Monitoring Plan (if applicable)</p> <p>Describe any provision for monitoring the data for safety.</p> <p>-Not Applicable</p>
<p>(9) Limitations</p> <p>A Maze Us Generator app can only randomly generate mazes but it cannot solve them. The app also recommends a minimum input of 2 rows and columns and a maximum of 100 rows and 100 columns for optimal performance. Larger grid sizes would make the maze cells too minuscule to be visible to the eye. This is because the app screen size is fixed at 700x700 pixels, it is not resizable or responsive. Since the app generates a new randomized maze for every run, it does not store previously generated mazes. The maze also does not have entry & exit points. Also since the program has li, it executes slowly for very large grid sizes.</p>
<p>(10) Ethical Considerations</p>

	PUP-UNIVERSITY RESEARCH ETHICS CENTER		
	Study Protocol / Research Protocol	UREC Form No.	10
		Version No.	1

- A. Informed Consent (Applies to studies using human subjects) --Not Applicable
- B. Risks and Side Effects (Applies to studies using human subjects) --Not Applicable
- C. Benefits to Subjects (Applies to studies using human subjects) --Not Applicable
- D. Costs to Subject (Applies to studies using human subjects) --Not Applicable
- E. Compensation to Subject (Applies to studies using human subjects) --Not Applicable
- F. Provisions for vulnerable subjects (Applies to studies using human subjects) --Not Applicable


G. Subject Privacy and Data Confidentiality (Applies to studies using human subjects)

--Not Applicable

(11) Plan for Dissemination of Findings

In the case of our maze generator, the findings could include the efficiency and effectiveness of the algorithm that we used to generate the mazes, as well as any potential applications or improvements to the algorithm. We can also share our findings with others in the field through online forums or by sharing our code and data on websites such as GitHub. Overall, our aim is to disseminate the findings and share the results with others and contribute to the broader body of knowledge in the field.



	PUP-UNIVERSITY RESEARCH ETHICS CENTER				
	Study Protocol / Research Protocol	<table border="1"> <tr> <td>UREC Form No.</td> <td>10</td> </tr> <tr> <td>Version No.</td> <td>1</td> </tr> </table>	UREC Form No.	10	Version No.
UREC Form No.	10				
Version No.	1				

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(13) Appendices

	(14) Prepared by	(15) Endorsed by
Signature	Alleina Gracie Abad	
Name of proponent	David Estrella Jovielette Orlanda Alleina Abad Alijah Andres Joshua Mateo Eden Inovejas	 Ms. Angie Payne, MSIT, MCP
Designation/position	Student	(Immediate Supervisor)
Date	10/17/2022	

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