Program Requirements Document

CIS 022 Wednesday, February 8th, 2024

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| **Application/ Program name:** | L1-4 |
| **Written by:** | Adam Karsner, Anele Ngcongo, Elijah Topete,  John Weaver, Sebastian Tiberos Cruz |

| **Purpose or problem definition:** |
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| The purpose of this program is to determine how many trees of a given radius can be can be planted in a yard with a specified length in feet, when there is also a certain amount of space between each fully grown planted tree. The program also determines the amount of space occupied by each fully grown planted tree in feet. |

| **Program Procedures:** |
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| 1. Display information about the source code’s author, the name of the program, and the filename of its compiled .exe form. 2. Display prompt – Ask the user to enter the length of the yard in feet. 3. Display prompt – Ask the user to enter the radius of a fully grown tree. 4. Display prompt – Ask the user to enter the desired distance in feet between fully grown trees. 5. Convert the entered radius of a fully grown tree from inches to feet. 6. Calculate the amount of linear space occupied by each fully planted tree with spacing included. 7. Calculate the total area that a fully grown tree would occupy in feet. 8. Calculate the number of trees that can be planted in the yard. 9. Display the total number of trees that can be planted in the yard. 10. Calculate the total area that would be occupied by all fully grown trees in feet (rounded to 2 decimal places). 11. Display the total area of space occupied by all planted fully grown trees in feet. 12. Display prompt asking the user to press a key to exit the program. 13. Exit program. |

| **Algorithm/Processing/Conditions:** |
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| **Inputs:** |
| 1. Length of the yard in feet. 2. The radius of a fully grown tree in inches. 3. The required amount of space between planted fully grown trees in feet. |
| **Processes:** |
| 1. Convert the entered radius of a fully grown tree from inches into feet. 2. Calculate the amount of linear space occupied by each fully planted tree with spacing included. 3. Calculate the total area that a fully grown tree would occupy in feet. 4. Calculate the number of trees that can be planted in the yard. 5. Calculate the total area that would be occupied by all fully grown trees in feet (rounded to 2 decimal places). |
| **Outputs:** |
| 1. Display the number of fully grown trees that can be planted in the yard. 2. Display the total area of space occupied by planted fully grown trees. |
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| **Notes & Restriction:** |
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| It is assumed that the user will only enter numerical values for every input.  It is assumed that the user will always enter input when prompted. |

| **Comments:** |
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| There is no error handling in this program.  If the user enters anything other than numbers for any of the input prompts, the program will behave erratically and/or unexpectedly exit (crash). |