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CSY2092

**Operating Systems**

Assignment

Bash Scripting Report

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# 1. Introduction

This report documents the development of three bash scripts and a personalized bash prompt for the CSY2092 Operating Systems assignment. The purpose is to demonstrate practical bash scripting skills and understanding of shell programming concepts.

The three main scripts made are:

* **Area.sh** - Calculates the area of a rectangle with user input validation
* **Bonus\_calculator.sh** - Computes employee salary bonuses based on various criteria
* **Blackjack.sh** - A complete GUI based blackjack card game

Additionally, the assignment includes **personalizing the bash prompt** to customize the terminal appearance and functionality.

Each script showcases different programming techniques including user input handling, mathematical calculations, conditional logic, loops, and interactive interfaces. For each script, this report provides a detailed description, user guide, flowchart, test cases, and screenshots demonstrating the functionality. The scripts utilize various bash features such as Whiptail for user-friendly interfaces and proper error handling to ensure robust operation.

This assignment demonstrates the practical application of bash scripting for automation and system administration tasks in Unix/Linux environments.

# 2. Area.sh

# 2.1. Introduction

The Area.sh is a bash program designed to calculate the area of rectangle based on user-provided lenth and width value. This script demonstrates fundamental bash programming concepts including user input handling, input validation, mathematical operations, and a GUI using Whiptail dialogs.

## 2.2. Description of the Main Functionality

The Area.sh script performs the following key functions:

1. Input Collection: Prompts the user to enter length and width of rectangle through interractive dialog boxes
2. Input Validation: Checks that the entered values are positive numbers and handles invalid input apporpriately
3. Mathematical Calculation: Computes the area using the formula: Area = Length \* Width
4. Result Display: Show the calculated area in user-friendly format
5. Error Handling: Provides appropriate error messages for invalid input and offers options to retry
6. User Interface: Utilizes Whiptail to create an intutive graphical inteface in the terminal

The script follows a structured approach with proper approach with proper variable declarations, conditional statements, and loop constructs to ensure operation and user experience.

## 2.3. User Guide for the Area of a Rectangle

## 2.3.1. Program Launching

To launch the Area.sh program:

1. Open a termila window
2. Navigate to the directory containing the Area.sh script
3. Make the script executable: chmod +x Area.sh
4. Execute the script: Area.sh
5. The program will launch with a welcome dialog

## 2.3.2. Requirements in Input Fields

The program requires the following inputs from the user:

1. Length: A positive numerical value representing the length of the rectangle

* Must be greater than 0
* Can be integer or decimal values
* Invalid inputs includes negative numbers, zero, or non-numeric characters

1. Width: A positive numerical value representing the width of the rectangle

* Must be greater than 0
* Can be integer or decimal values
* Invalid inputs includes negative numbers, zero, or non-numeric characters

Input Validation Rules:

1. Only positive numbers are accepted
2. The program will display error messages for invalid inputs
3. Users can retry entering values if validation fails
4. Empty inputs are not Accepted

## 2.3.3. Main Outcome

Upon successful execution, the program provides:

1. Area Calculation: Displays the calculated with approptiate units
2. Result Format: Shows the results in clear, formatted message box
3. Restart Option: Offers the user the choice to calculate another area or exit
4. Error Recovery: If invalid inputs are provided, the program displays error messages and allows re-entry

Sample Output Format:

|  |
| --- |
| Rectangle Area Calculation  Length: [user input] units  Width: [user input] units  Area: [calculated result] square units |

The program ensures accurate calculations and provides a user-friendly experience throughout the interaction process.

## 2.4. Flowchart for Area.sh

[Insert content here]

## 2.5. Testcase for Area.sh

[Insert content here]

## 2.6. Screenshot of Implemented Feature for Area.sh

[Insert content here]

# 3. Bonus\_calculator.sh

[Insert content here]

## 3.1. Introduction

[Insert content here]

## 3.2. Description of the Code/Script

[Insert content here]

## 3.3. User Guide for Bonus\_calculator.sh

[Insert content here]

## 3.3.1. Launching of the Program

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## 3.3.2. Input Field Requirements

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## 3.3.3. Main Outcome

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## 3.3.4. Restarting the Prompts

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## 3.5. Testcase for Bonus\_calculator.sh

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## 3.6. Screenshots of an Applied Feature Based on the Test Case

[Insert content here]

# 4. Personalizing the Bash Prompt

[Insert content here]

# 5. Blackjack.sh

[Insert content here]

## 5.1. Introduction

[Insert content here]

## 5.2. Description of the Game

[Insert content here]

## 5.2.1. Initialization of the Deck

[Insert content here]

## 5.2.2. Shuffling Process

[Insert content here]

## 5.2.3. Dealer and Player’s Hand

[Insert content here]

## 5.2.4. Adding the Turn Mechanism

[Insert content here]

## 5.2.5. Rules of the Game

[Insert content here]

## 5.2.6. Major Cases

[Insert content here]

## 5.2.7. Interface

[Insert content here]

## 5.3. User Guide for Blackjack.sh

[Insert content here]

## 5.3.1. Beginning of the Game

[Insert content here]

## 5.3.2. Overall Gameplay

[Insert content here]

## 5.3.3. Winning Conditions

[Insert content here]

## 5.3.4. Blackjack

[Insert content here]

## 5.3.5. Applying Five-Card Trick

[Insert content here]

## 5.4. Flowchart for Blackjack.sh

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## 5.5. Testcase for Blackjack.sh

[Insert content here]

## 5.6. Screenshot of Applied Feature or Functionality

[Insert content here]

# 6. Additional Description

[Insert content here]

## 6.1. Whiptail

[Insert content here]

## 6.2. Shebang

[Insert content here]

# 7. Conclusion

[Insert content here]

# 8. References

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# 9. Appendix

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## 9.1. Area.sh

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## 9.2. Bonus\_calculator.sh

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## 9.3. Blackjack.sh

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## 9.4. Bash Prompt Personalized

[Insert content here]

## 9.5. Changing the Name of Terminal

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