**COAL LAB Project**

**Procedures List**

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| Sr. | Procedure Name | Parameters | Returns | Description |
| 1 | Run\_Game | None | None | Call the menu function and run the game |
| 2 | Title\_2048 | None | None | Print the logo of the game |
| 3 | Loading | None | None | Print loading string |
| 4 | Menu | None | Option for selection in AL | Print Menu and get input then call the respective function |
| 5 | Credits | None | None | Print the Credits |
| 6 | How to play | None | None | Print instructions for playing |
| 7 | Rules | None | None | Print Rules for Playing |
| 8 | Play | None | None | Start the Game by Calling Functions |
| 9 | Game\_Start | None | Board with 2 Randomly placed numbers | Initializes the board with 0 and the place two random numbers on it and print the board |
| 10 | Two\_or\_Four | None | placing 2 or 4 | Generates Random Index Number and check if it is already placed or not other than zero if yes then generates again and place on that index 2 or 4 |
| 11 | Two insert | None | Placing of 2 | This Function place 2 only  (This function is needed for starting only)  Because on starting we have to place 2 only and on 2 different indexes |
| 12 | Random Generator | None | 2 or 4 in AL | It generates random number 0 to 4 if it not 2 or 4 then generates again and |
| 13 | Print Board | Grid | Board | Printing the main board for game on screen |
| 14 | S\_space | None | Character | This is function used for only one space where needed |
| 15 | writespace | TAB | Character | This function is used for printing 8 spaces on the screen where needed |
| 16 | PerformOper | None | None, just calling proc | Take input for movement and call the respective function and then checking for win and loss and if not, both then generates new random number on random index |
| 17 | GameControls | None | Moves Counter and Score | This function displays instructions for movements with total moves and Score of the player |
| 18 | Up\_Mov | None | Nothing, just call the functions | This Function class the necessary functions for the upper movement  First it will remove zeros and then check same adjacent values merge them and replace other one with zero and removes zeros again |
| 19 | Up\_zero\_Removing | Ecx ,colno | Updated Grid | Replacing zeros column wise upward and updating the grid |
| 20 | Up\_Add | Ecx,colno | None | Adding the Similar adjacent values upward |
| 21 | Down\_Mov | None | Nothing ,just call the functions | This Function class the necessary functions for the downward movement  First it will remove zeros and then check same adjacent values merge them and replace other pne with zero and removes zeros again |
| 22 | Down\_zero\_Removing | Ecx ,colno | Updated Grid | Replacing zeros column wise downward and updating the grid |
| 23 | Down\_Add | Ecx,colno | None | Adding the Similar adjacent values downward |
| 24 | Left\_Mov | None | Nothing ,just call the functions | This Function class the necessary functions for the left movement  First it will remove zeros and then check same adjacent values merge them and replace other one with zero and removes zeros again |
| 25 | Left\_zero\_Removing | Ecx ,rowno | Updated Grid | Replacing zeros row wise to left side and updating the grid |
| 26 | Left\_Add | Ecx,rowno | None | Adding the Similar adjacent values to left side |
| 27 | Right\_Mov | None | Nothing ,just call the functions | This Function class the necessary functions for the right movement  First it will remove zeros and then check same adjacent values merge them and replace otherone with zero and removes zeros again |
| 28 | Right\_zero\_Removing | Ecx ,rowno | Updated Grid | Replacing zeros row wise to right side and updating the grid |
| 29 | Right\_Add | Ecx,rowno |  | Adding the Similar adjacent values to right |
| 30 | checkWin | Ecx | Character | Check 2048 appears it will declare you as a winner |
| 31 | isEmpty | ecx | character | Check if the blocks are filled no movement left declare you as a loser |
| 32 | Generate\_Values | Nothing | Nothing | If grid is updated, then this function will be called for generating values |
| 33 | IsChanged | Nothing | Nothing | Compares the backup grid and real grid if it is changed or not |