**Computer organization and Assembly language**

**(CEN 324)**



**Bahria University Islamabad E8**

**COAL PROJECT**

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**Class:**

BS CS(3A)

**Project Title: Factorial Fury**

**CODE:**

include irvine32.inc

.data

header BYTE " ; FACTORIAL FURY ", 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

BYTE 0dh, 0ah, 0

userPrompt BYTE "Enter a number to calculate its factorial: ", 0

resultMessage BYTE "The factorial is: ", 0

newline BYTE 0dh, 0ah, 0

userInput DWORD ?

calculatedFactorial DWORD ?

loopCounter DWORD ?

.code

main PROC

;--------------------------------------------------------

; Print Header Section

;--------------------------------------------------------

mov edx, OFFSET header ; load address of header into edx

call WriteString ; print header

;--------------------------------------------------------

; Get User Input Section

;--------------------------------------------------------

mov edx, OFFSET userPrompt ; load address of userPrompt into edx

call WriteString ; print userPrompt

call ReadInt ; read user input

mov userInput, eax ; store user input in userInput

;--------------------------------------------------------

; Calculate Factorial Section

;--------------------------------------------------------

mov eax, 1 ; initialize eax to 1

mov calculatedFactorial, eax ; initialize calculatedFactorial to 1

mov ecx, userInput ; load user input into ecx

calculateFactorialLoop:

mov eax, calculatedFactorial ; load calculatedFactorial into eax

mul ecx ; multiply eax by ecx

mov calculatedFactorial, eax ; store result in calculatedFactorial

loop calculateFactorialLoop ; repeat loop until ecx is 0

;--------------------------------------------------------

; Display Output Section

;--------------------------------------------------------

mov edx, OFFSET resultMessage ; load address of resultMessage into edx

call WriteString ; print resultMessage

mov eax, calculatedFactorial ; load calculatedFactorial into eax

call WriteDec ; print calculatedFactorial

mov edx, OFFSET newline ; load address of newline into edx

call WriteString ; print newline

;--------------------------------------------------------

; Exit Program Section

;--------------------------------------------------------

call Crlf ; print newline

call WaitMsg ; wait for user to press enter

call ExitProcess ; exit program

main ENDP

END main