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CSE 13S

Assignment 3 - Tower of Hanoi Program Design

Data Design

```
Define OPTIONS with string constant of “srnx:”
Declare s, r, n, x as bool initialized to false
Declare disk_num as string initialized to “NULL”
Declare default_disk as static integer initialized to 0;
Declare A, B, C as characters initialized to ‘A’, ‘B’, ‘C’
```

Main Module Design

```
Begin Main (pass in argc as integer, in argv as string)
    Declare integer c initialized to 0
    Begin While
    While (c = getopt(pass in argc as integer, in argv as string, in OPTIONS as
        string)) does not equal -1
        Begin switch (c)
            Case ‘n’
                Assign value of true to n
                Break statement
            Case ‘x’
                Assign value of optarg to disk_num
                Convert string to integer type using atoi(disk_num) assign value to
            default_disk;
                Break statement
            Case ‘s’
                Assign value of true to s
                Call stack() module
                Break statement
             Case ‘r’
                Assign value of true to r
                Call recursive(pass in default_disk as static integer, in A as
                        character, in B as character, in C as character )
                Break statement
            Case ‘?’
                Display “Character not defined in the string”
                Return with exit status fail
            Default Case
                Begin if
                If n == false
                    Assign integer value of 5 to default_disk;
                End if
                Break statement
        End switch
    End While
    Begin if
    If (argc == 1)
        Display “Error: no arguments supplied!”
        Return with exit status fail
    End If
End Main
```

recursive Module Data Design

recursive Module Design

```
Begin recursive
    Begin if
    If default_disk == 0
        return;                 // base case
    End if
    Begin else
    Else
        Call recursive(pass in default_disk -1, in A as character, in C as character, in B as
                character)
        Display “Move peg default_disk from  A to B”
        Call recursive(pass in default_disk -1, in C as character, in B as character, in A as
                character)
    End else
End recursive
```