Module 1 Problems PsuedoCodes

24 September 2024

Largest Prime Optimized Approach

```
-----------------------------------------------------------------------------
FUNCTION LargestPrime(number)
    maxPrime = -1

  // Check for factor of 2
  WHILE number is divisible by 2 DO
    maxPrime = 2
    number = number / 2

  // Check for odd factors from 3 onwards
  FOR i FROM 3 TO sqrt(number) STEP 2 DO
    WHILE number is divisible by i DO
      maxPrime = i
      number = number / i

  // Check if the remaining number is greater than 2
  IF number > 2 THEN
    maxPrime = number

  RETURN maxPrime

END FUNCTION
```

BigBag SmallBag Problem

```
----------------------------------------------------------

FUNCTION Goal(bigCount, smallCount, goal)

  totalWeight = (bigCount * 5) + smallCount

  IF totalWeight >= goal THEN

    IF (goal MOD 5) <= smallCount THEN
      RETURN TRUE  // Goal can be achieved
    END IF
  END IF

  RETURN FALSE  // Goal cannot be achieved
END FUNCTION
```

Hamming Distance

```
-----------------------------------------------------------
FUNCTION solve(X, Y)
    result = new StringBuilder()

  FOR i FROM 0 TO LENGTH(X) - 1 DO

    IF X[i] == 'B' AND Y[i] == 'B' THEN
      result.APPEND('W')
    ELSE

      result.APPEND('B')
    END IF
  END FOR

  RETURN result.TO_STRING()
END FUNCTION
```

Utopian Tree

```
----------------------------------------------

FUNCTION tree(n)
  h = 1

  FOR i FROM 1 TO n DO
    IF i MOD 2 == 0 THEN
      h = h + 1
    ELSE
      h = h * 2
    END IF
  END FOR

  RETURN h  (actual result)

END FUNCTION
```

Sum of array elements with Twist

```
-------------------------------------------------------------------------------------
FUNCTION calculateSum(n, a)

  sum = 0
  flag = 0

  FOR i FROM 0 TO n - 1 DO

    IF a[i] == 6 THEN
      flag = 1  // Set flag to indicate that 6 was found
    END IF

    // If flag is not set, add the current element to sum
    IF flag == 0 THEN
```

```
        sum = sum + a[i]
    END IF

    // Check if the current element is 7 and flag is set
    IF a[i] == 7 AND flag == 1 THEN
        flag = 0  // Reset flag when 7 is found
    END IF
  END FOR

  RETURN sum

END FUNCTION
```