Heimadæmi – heimadæmi 4

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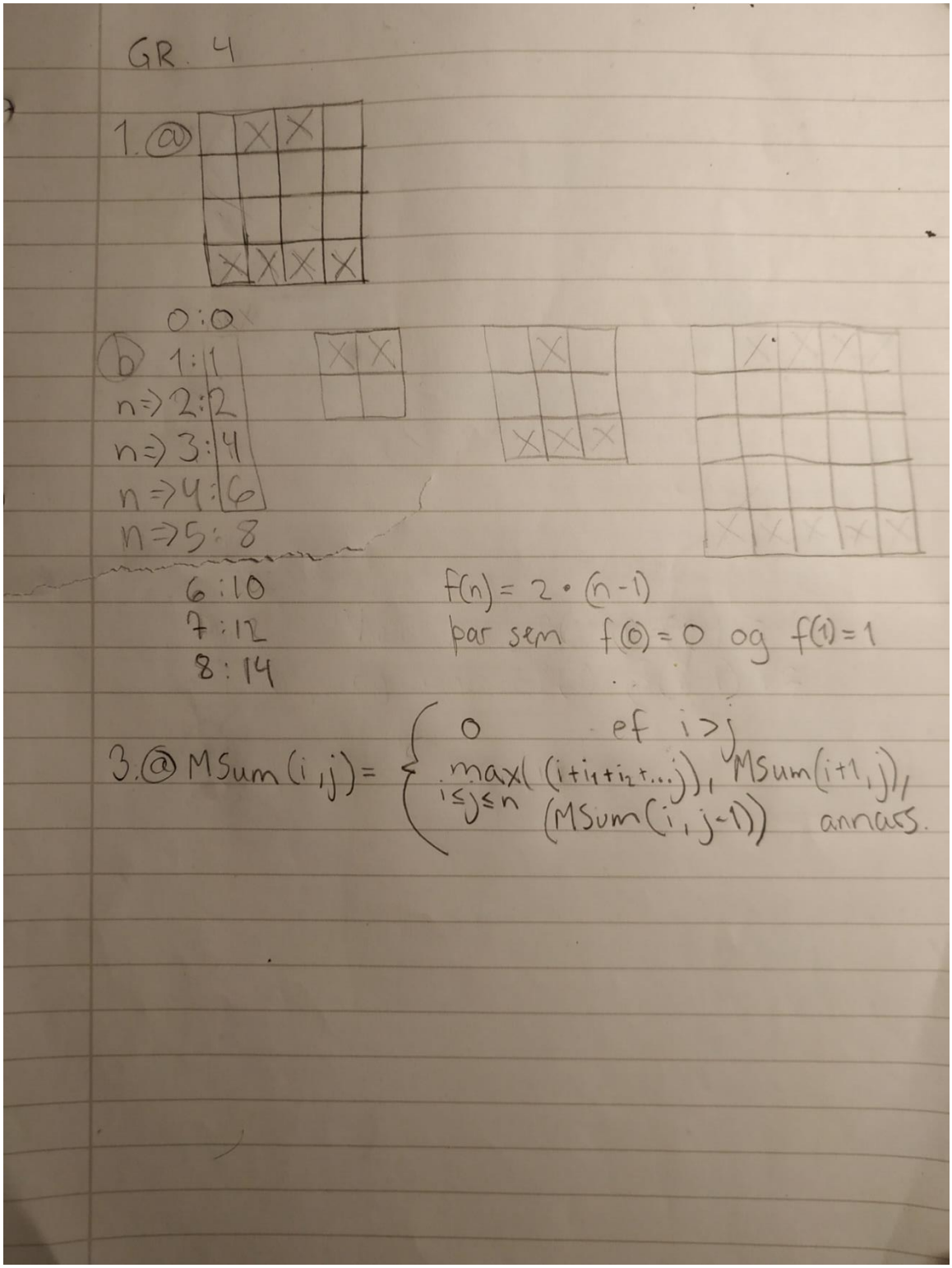
1.

3.a)



2.

```python
def CountSS(X, i, T, count):
    if T == 0:
        return count + 1
    elif T < 0 or i == 0:
        return count
    else:
        med = CountSS(X, i-1, T - X[i], count)
        an = CountSS(X, i-1, T, count)
    return med + an

listinn = [0,1,2,3,4,5,6,7]
print("fjöldi mismunandi hlutmengja með summu 26:",CountSS(listinn,len(listinn)-1, 26, 0))
print("fjöldi mismunandi hlutmengja með summu 25:",CountSS(listinn,len(listinn)-1, 25, 0))

def ValueSS(X, V, i, T, val):
    if T == 0:
        return val
    elif T < 0 or i == 0:
        return float("-inf")
    else:
        med = ValueSS(X, V, i-1, T - X[i], val + V[i])
        an = ValueSS(X, V, i-1, T, val)
    # med = int(med)
    # an = int(an)
    return max(med, an)

listinn = [0,1,2,3,4,5,6,7]
values = [10,3,7,6,4,9,4,1]
print("max value með summu 27:",ValueSS(listinn, values, len(listinn)-1, 27, 0))
print("max value með summu 26:",ValueSS(listinn, values, len(listinn)-1, 26, 0))
print("max value með summu 29:",ValueSS(listinn, values, len(listinn)-1, 29, 0))
```

```
fjöldi mismunandi hlutmengja með summu 26: 1
fjöldi mismunandi hlutmengja með summu 25: 2
max value með summu 27: 31
max value með summu 26: 27
max value með summu 29: -inf
```

3. b)

```python
A = [-6, 12, -7, 0, 14, -7, 5]

def MSum(i, j):
    orgI = i
    orgJ = j
    if i>j:
        return 0
    best = 0
    while i<=j:
        best = best + A[i]
        i += 1
    return max(best, MSum(orgI + 1, orgJ), MSum(orgI, orgJ-1))

print("listi A:", MSum(0, len(A)-1))
```

```
listi A: 19
```

4.

```python
def LIS(A):
    best = 0
    n = len(A)
    for i in range(n):
        best = max(best, LISfirst(A, i, n))
    return best

def LISfirst(A, i, n):
    best = 0
    j = i + 1
    while j < n:
        if A[j] > A[i]:
            best = max(best, LISfirst(A, j, n))
        j = j + 1
    return 1 + best

listinn = [2, 7, 1, 8, 2, 8, 1, 8, 2, 8, 4, 5, 9, 0, 4, 5, 2, 3, 5, 3]
print(LIS(listinn))
```

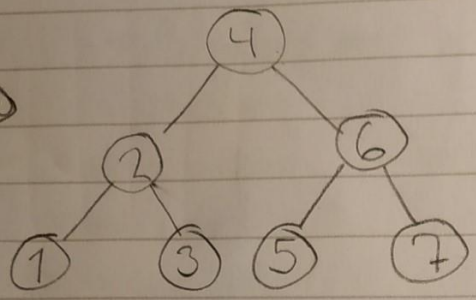
```
C:\Users\addi\Desktop\Háskóli\onn 4\GreiningReiknirita\vika4>python daemi4.py
5
```

5.

GR. 4

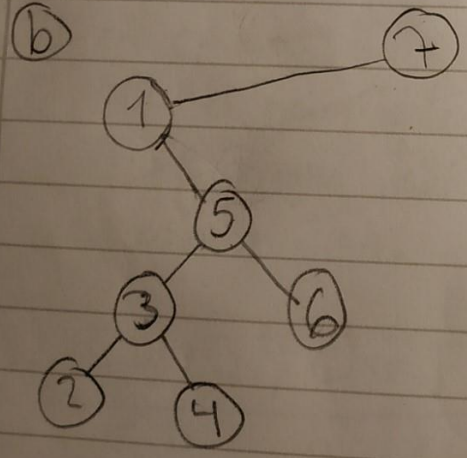
5.

a)



leitarkostnaður: $3 \cdot 10 + 2 \cdot 2 + 3 \cdot 5 + 1 \cdot 2 + 3 \cdot 8 + 2 \cdot 2 + 3 \cdot 20 = 139$ //

b)



leitarkostnaður: $1 \cdot 20 + 2 \cdot 10 + 3 \cdot 8 + 4 \cdot 2 + 4 \cdot 5 + 5 \cdot 2 + 5 \cdot 2 = 112$ //