hw05

jack frate

1.

a.

r.d = 4

r.π = s

s.d = 3

s.π = w

t.d = 1

t.π = u

u.d = 0

u.π = nil

v.d = 5

v.π = r

w.d = 2

w.π = t

x.d = 1

x.π = u

y.d = 1

y.π = u

b.

We never check for the color black, so line 18 is unneeded. Since we have 2 colors now, you could use bits or Booleans to keep track of it.

c.

In theorem 22.5, it states that u.d is “distance” between the source and u. The proof does not take into consideration that the adjacency lists are in any particular order.

But what the order can impact is in how the edges appear.

2.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0 | 150 | 330 | 405 | 1655 | 2010 |
|   | 0 | 360 | 330 | 2430 | 1950 |
|   |   | 0 | 180 | 930 | 1770 |
|   |   |   | 0 | 3000 | 1860 |
|   |   |   |   | 0 | 1500 |
|   |   |   |   |   | 0 |

0  1  2  2  4  2

     0  2  2  2  2

         0  3  4  4

             0  4  4

                 0  5

                     0

NOTE: the formatting on this one was messed up a bit, sorry for that.

((A1 A2) (A3 A4) (A5 A6))

2010 multiplications

3.

a.

A recursive matrix chain will be at least 2n. When using it, it can also repeat many calculations. If we were

to find all of the permutations, and then find the number of multiplications for each will help us skip the duplicate calls.

b.

Yes it is. It will still be matrix multiplication, so it will work fine as well as the sctions are optimized.

4.

a.

es(S,M,i,j)  = (M - j + i - $Σ$jk=i lk)

c.

bl(S,M,i,j) = M - s(S,M,i,j)      if es(S,M,i,j) <= M

                         ∞                          if es(S,M,i,j) > M

 e.

mb(S,M) =  0                                            if s = []

                      minimum(bl(S,M))        else

i.  Θ (n2)

5

a.

a.

s.d = 2

s.π = z

t.d = 4

t.π = x

x.d = 6

x.π = y

y.d = 9

y.π = z

z.d = 0

z.π = nil

b.

s.d = 0

s.π = nil

t.d = 0

t.π = x

x.d = 2

x.π = z

y.d = 7

y.π = s

z.d = -2

z.π = t