```python
# coding: utf-8

print 'IMPLICIT'
print '-------------------------------------------------------------------------------------------------'

n = 10
m = 400
tau = .5/m
h = 1./n
sigma = tau / h**2

def phi(x):
    return 1.0 / (1 + x**2)**2

u_prev = [phi(i*h) for i in range(n+1)]
u_cur = [0 for dummy_idx in range(n+1)]

for k in range(1,m+1):
    alpha = [0, 2*sigma / (2*sigma + 3*tau + 3)]
    beta = [0, 3*u_prev[1] / (2*sigma + 3*tau + 3)]
    for i in range(2,n):
        alpha.append(sigma / (sigma * (2 - alpha[i-1]) + tau + 1))
        beta.append((sigma * beta[i-1] + u_prev[i]) / (sigma * (2 - alpha[i-1]) + tau + 1))

    u_cur[n] = ((4 - alpha[n-2]) * beta[n-1] - beta[n-2]) / (3 + alpha[n-1] * (alpha[n-2] - 4))
    for i in range(n-1, 0, -1):
        u_cur[i] = alpha[i] * u_cur[i+1] + beta[i]
    u_cur[0] = (4 * u_cur[1] - u_cur[2]) / 3.

    u_prev = [u_cur[i] for i in range(n+1)]

    if (k % (m / 10) == 0):
        print 'the ', k, "'th layer is: ", u_cur
        print

print '==========================================================================================='
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IMPLICIT

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the 40 'th layer is: [0.8146602868131211, 0.8050946740657332, 0.7763978358235696,
0.731525520174749, 0.6750221806905108, 0.6124914191756712, 0.5500340895867991,
0.4937161634333348, 0.4490591871687149, 0.42052409202750257, 0.41101239364709846]

the 80 'th layer is: [0.7003135014675959, 0.6947776950730232, 0.6781702758893052,
0.6521373064482529, 0.6192568787648411, 0.5827815634794405, 0.5463157069589354,
0.5134599147692271, 0.48745702094007215, 0.47087324274511255, 0.46534531668012596]

the 120 'th layer is: [0.6228368030830346, 0.6196142551619167, 0.609946611398563,
0.5947896910449576, 0.5756418651542444, 0.554395735108236, 0.5331509170786441,
0.5140065091434153, 0.4988537629959607, 0.489189401382976, 0.4859679475119811]

the 160 'th layer is: [0.5672413246611286, 0.5653644073659845, 0.5597336554805522,
0.5509055411407078, 0.5397525030319716, 0.527376702014197, 0.5150010830829103,
0.5038485193314346, 0.4950209843057184, 0.4893906879320851, 0.48751392247420733]

the 200 'th layer is: [0.5248933961019869, 0.5238001073135132, 0.520520240948092,
0.5153779073098516, 0.5088812594860689, 0.5016722753500917, 0.49446331648484554,
0.4879667344943648, 0.4828244812557842, 0.47954467810821383, 0.478451410392357]

the 240 'th layer is: [0.4907468539029593, 0.49011000723995224, 0.488199467250931,
0.48520402579480276, 0.4814196799348317, 0.4772203822511575, 0.47302108807466225,
0.4692367513513148, 0.46624132105339033, 0.4643307898380086, 0.4636939460995479]

the 280 'th layer is: [0.461839544266937, 0.4614685755482996, 0.4603556693923875,
0.4586107981222327, 0.4564063819248929, 0.45396025101041354, 0.4515141205826756,
0.4493097056533549, 0.4475648359317824, 0.4464519309935127, 0.4460809626807561]

the 320 'th layer is: [0.4364235964458743, 0.43620750365374367, 0.4355592252773517,
0.43454282115645365, 0.4332587275892228, 0.4318338326779144, 0.4304089378341581,
0.4291248444290816, 0.42810844053692854, 0.42746016232952544, 0.42724406959372435]

the 360 'th layer is: [0.4134594562758452, 0.4133335801378103, 0.41295595172370564,
0.4123638864976579, 0.41161588956015843, 0.410785874447939, 0.409955859345095,
0.4092078624320189, 0.4086157972357983, 0.40823816884514624, 0.4081122927149288]

the 400 'th layer is: [0.39232119934021853, 0.3922478752687922, 0.39202790305451307,
0.3916830193156611, 0.39124730383897527, 0.3907638119754554, 0.3902803201132368,
0.38984460463994064, 0.38949972090522783, 0.3892797486942031, 0.3892064246238615]

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