#include<stdio.h>

#include<math.h>

int main()

{

int i,j,n,m;

float h,k,a,r,u[10][10];

h = 0.5,k=0.125,a=1,n=5,m=5;

for(j=0; j<m+1; j++)

{

u[0][j]=0;

}

for(j=0; j<m+1; j++)

{

u[n-1][j]=100;

}

u[1][0]=20;

u[2][0]=40;

u[3][0]=60;

r =(k\*a\*a)/(h\*h);

for(j=0; j<m; j++)

{

for(i=1; i<n-1; i++)

u[i][j+1] = r\*(u[i-1][j]+u[i+1][j]+(1-2\*r)\*u[i][j]);

printf("\n");

}

printf("Solution of parabolic equation: \n");

printf("(i,j)\t");

for(i=1; i<n; i++)

printf("u(%d,j)\t",j);

printf("\n");

for(j=0; j<m+1; j++)

{

printf("(i,%d)\t",j);

for(i=1; i<n; i++)

{

printf("%5.2f\t",u[i][j]);

}

printf("\n");

}

}

//output

//Solution of parabolic equation:

//(i,j) u(5,j) u(5,j) u(5,j) u(5,j)

//(i,0) 20.00 40.00 60.00 100.00

//(i,1) 20.00 40.00 70.00 100.00

//(i,2) 20.00 45.00 70.00 100.00

//(i,3) 22.50 45.00 72.50 100.00

//(i,4) 22.50 47.50 72.50 100.00

//(i,5) 23.75 47.50 73.75 100.00