



UPPSALA  
UNIVERSITET

Institutionen för  
informationsteknologi

Besöksadress:  
MIC, Polacksbacken  
Lägerhyddvägen 2

Postadress:  
Box 337  
751 05 Uppsala

Telefon:  
018-471 0000 (växel)

Telefax:  
018-51 19 25

Hemsida:  
<http://www.it.uu.se/>

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Department of  
Information Technology

Visiting address:  
MIC, Polacksbacken  
Lägerhyddvägen 2

Postal address:  
Box 337  
SE-751 05 Uppsala  
SWEDEN

Telephone:  
+46 18-471 0000 (switch)

Telefax:  
+46 18-51 19 25

Web page:  
<http://www.it.uu.se/>

## Assignment - Finite difference methods to price European Options

### Assignment

- Write MATLAB-program to price European call options under CEV-model:

$$\frac{\partial v}{\partial t} + rs \frac{\partial v}{\partial s} + \frac{1}{2} \sigma^2 s^{2\gamma} \frac{\partial^2 v}{\partial s^2} - rv = 0, \quad (1)$$

$$v(T, s) = \Phi(s). \quad (2)$$

- Make relevant and interesting experiments.
- Report program code, interesting plots etc.

The experiments should (at least) reflect accuracy aspects, stability and how the solution varies with  $\gamma$ . You should also implement an implicit and an explicit method and make some comparisons with respect to computational complexity.

As an example you can use the following parameters:  $K = 15$ ,  $r = 0.1$ ,  $\sigma = 0.25$ ,  $T = 0.5$ ,  $\gamma = 0.8$ . Note that in order to use `bsexact.m` you need to compare the results with your computations using  $\gamma = 1$ .

You have the opportunity to have tutoring 10 min/group. Fill in the doodle <https://doodle.com/poll/4nzbm4ct96457f4r> to book your time-slot for tutoring.

Your results should be uploaded to Studentportalen no later than 18/9 at noon.

During 18-20/9 there will be a questionnaire open in the Student Portal that you all have to answer individually.

For all extra questions feel free to email [slobodan.milovanovic@it.uu.se](mailto:slobodan.milovanovic@it.uu.se).