Financial derivatives
Homework: Numerical pricing of American options

Assignment:
The stock price *S* follows a geometrical Brownian motion with parameters μ=0.20, σ=0.40. The stock does not pay dividends. Interest rate equals 10 percent. Compute the price of an American put option with expiration in half a year and exercise price 10 USD for the following stock prices: 0, 2, 4, 6, 8, 10, 12, 14, 16 USD. Give the results to 4 decimal places.

Submission:
- You can work **individually or in pairs** (in that case both members of the team need to be able explain all the steps, choices of parameters, etc. of the solution)
- **Deadline: before the test (19ᵗʰ December, 12:20)**
- The necessary condition for getting the credit for this HW is to pass the test, i.e. to obtain at least 50% of possible points. The test only deals with basic concepts – without proofs (the difference between American and European options, concept of the free boundary, how to set the boundary conditions, numerical schemes and their parameters) and what exactly you have done in your code. The test is close-book.
- Submission: by e-mail: beata.ulohy@gmail.com, with subject **derivatives 2014 – option** – **name/names.** Submit your **code and the table with results** (option price for each of the given stock prices)
- Grading: according to the accuracy of your results
  - for each stock price:
    - 8 points for the answer accurate to 4 decimal places
    - 0 points for the answer with the error equal to the error coming from using the European option price
    - linear function of error between
  - the final number of points is the average