Project 7

MGMTMFE 405

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Question 1.

$\Delta X = \sigma\sqrt{\Delta}$

	Explicit	implicitly	CN method
Pu	**0.502236**	**-0.502236**	**-0.251118**
Pm	**-8e-05**	**2.00008**	**1.50004**
Pd	**0.497764**	**-0.497764**	**-0.248882**

$\Delta X = \sigma\sqrt{3\Delta}$

	Explicit	implicitly	CN method
Pu	**0.167958**	**-0.167958**	**-0.0839788**
Pm	**0.666587**	**1.33341**	**1.16671**
Pd	**0.165376**	**-0.165376**	**-0.0826878**

$\Delta X = \sigma\sqrt{4\Delta}$

	Explicit	implicitly	CN method
Pu	**Pu : 0.126118**	**Pu : -0.126118**	**Pu : -0.063059**
Pm	**Pm : 0.74992**	**Pm : 1.25008**	**Pm : 1.12504**
Pd	**Pd : 0.123882**	**Pd : -0.123882**	**Pd : -0.061941**

III

We compared the put option price of produced by three methods with the value calculated from the Black Scholes formula. We can see from the graph that all of the three methods give a good approximation of the Black-Scholes values. The Cranck Nicholson Method and Implicitly methods outperforms the Explicitly methods, giving a much closer estimation of the option price.

	BS	Explicit	Implicity	Crank Nicholson
European Put option	**0.4647**	**0.48584**	**0.463115**	**0.463416**

Question 2.

	Explicit	implicitly	CN method
Call option	**0.622911**	**0.660353**	**0.660819**
Put option	**0.497392**	**0.48076**	**0.481251**