**Report**

Task 1

1. Geometric Brownian motion from time 0 to time 3 is being simulated for 1000 runs and the value are stored in an array by using the code “t.linspace(0,3,1001)”.

The drift of the Brownian is then calculated by an equation and then plot the 5 realization point of Brownian motion.

The mean of S at time 3, S(3)is calculated by using “s3= S[:,1000]” over the number of path it use to obtain the mean, path = 5. Then variance is being computed by “var=np.var(s3)”.

The probability that S(3)>39 is being calculated by summing the value of S in 1000 runs by “P=sum(S[:,1000]>39)/path”, the expected of S(3) given S(3)>39 is being calculated by “Exp=sum(S[:,1000])” .

1. 1000 runs of Brownian motion and then computed the mean reversal process between times 0 to 1. The point is then plotted.

The expected of R(1)>2 is then being computed by calculated the sum of the Brownian motion.

Then the probability of R(1)>2 is then computed by using the sum of the mean over the path, “P = p.sum(R[:,n] > 2) / path”

Task 2

There are 30 component stocks in the FTSE Bursa Malaysia KLCI Index. (Information is as at 22/6/2015.)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Stock Name** | **Stock Code** | **Stock sector** | **Weightage(%)** | **PE ratio** | **Net market capital(MYRb)** |
| AMMB Holdings | [1015](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1015) | Bank | 2.38 | 8.82 | 16.97 |
| Astro Malaysia Holdings | [6399](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=6399) | broadcasting and entertainment | 1.22 | 28.06 | 15.761 |
| Axiata Group | [6888](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=6888) | Mobile telecommunication | 5.67 | 24.18 | 55.349 |
| British American Tobacco (Malaysia) | [4162](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4162) | consumer | 1 | 20.06 | 18.445 |
| CIMB Group Holdings | [1023](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1023) | bank | 5.96 | 17.52 | 46.694 |
| Digi.com | [6947](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=6947) | Mobile telecommunication | 4.04 | 21.02 | 41.83 |
| Genting | [3182](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=3182) | Travel & leisure | 3.68 | 19.3 | 30.748 |
| Genting Malaysia | [4715](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4715) | Travel & leisure | 2.5 | 20.59 | 25.71 |
| Hong Leong Bank | [5819](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5819) | banks | 1.67 | 11.19 | 24.572 |
| Hong Leong Financial | [1082](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1082) | finance | 0.64 | 9.92 | 16.255 |
| IHH Healthcare | [5225](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5225) | health care provider | 3.28 | 63.15 | 48.758 |
| IOI | [1961](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1961) | plantation | 2.99 | 73.65 | 26.731 |
| KLCC Prop &Reits- stapled sec | 5235ss | tursts | 0.63 | 26.42 | 12.64 |
| Kuala Lumpur Kepong | [2445](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=2445) | plantation | 2.28 | 29.21 | 23.983 |
| Malayan Banking | [1155](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1155) | bank | 9.32 | 12.45 | 88.041 |
| Maxis | [6012](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=6012) | Mobile telecommunication | 3.45 | 30.05 | 49.409 |
| MISC | [3816](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=3816) | marine transportation | 2.45 | 15.99 | 35.264 |
| PETRONAS Chemicals Group | [5183](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5183) | chemicals | 3.68 | 21.83 | 50.64 |
| PetronasDagangan | [5681](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5681) | Oil & gas producers | 1.21 | 37.05 | 20.445 |
| Petronas Gas | [6033](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=6033) | Oil & gas producers | 3.4 | 22.79 | 42.741 |
| PPB Group | [4065](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4065) | plantation | 1.8 | 18.13 | 18.233 |
| Public Bank | [1295](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1295) | banks | 11.75 | 15.21 | 73.368 |
| RHB Capital | [1066](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=1066) | banks | 1.06 | 9.18 | 19.129 |
| SapuraKencana Petroleum | [5218](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5218) | Oil & gas producers | 1.98 | 12.08 | 14.321 |
| Sime Darby | [4197](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4197) | General industry | 5.56 | 21.89 | 52.671 |
| Telekom Malaysia | [4863](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4863) | Mobile telecommunication | 2.96 | 32.34 | 24.915 |
| TenagaNasional | [5347](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=5347) | electricity | 9.28 | 9.15 | 69.304 |
| UMW Holdings | [4588](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4588) | consumer | 1.37 | 20.41 | 11.987 |
| Westports holdings | 5246 | transportation services | 0.93 | 27.44 | 14.36 |
| YTL Corp | [4677](http://www.bursamalaysia.com/market/listed-companies/list-of-companies/plc-profile.html?stock_code=4677) | Oil & gas producers | 1.63 | 14.95 | 16.67 |

2 . Petronas Dagangan Berhad (PDB) (5681) is being chosen as the counter from the KLSE.

The historical price from 1st Jan 2012 until 1st Jan 2015 is being read from the yahoo finance FTSEKLCI.

We find the moving average by using the code below

def moving\_avg (values, days):

weight=np.repeat(1.0, days)/days

sma=np.convolve(values, weight,'valid')

return sma

Then the moving average is being use to plot a 5-days moving average for PDB.

The correlation of PDB with FTSEKLCI is being computed by read the KLSE historical price from yahoo finance. The correlation is count by using the code

“correlation\_PDB\_klci= PDB\_klse\_closevalue.corr()”.