**About Numpy.**Matrix operations are a significant part of the inner loop of the algorithms we will implement in this module and subsequent modules. To speed up your code, it can be important to use a specialized matrix operations library. There are many such libraries out there. In Python, we recommend [Numpy](https://eventing.coursera.org/api/redirectStrict/RCuZnsmU5cLfExpeq7yvsXs2dbKADRWc-SDsii3g3taA0puNrrjxcXzWx10XR9iybv_BUbAOFXkaXdCfMTfEnA.6RLiCn1FuOREdNSpDfpm-g.PEb1AwNqenS31vxohIxKn76O4aYjLlefQmo0g6tMqyliu2vMg_53k21qu2KLa4TOrwYvE0nkL8C98s9_WpHWFJPymQX458wrhdpJlJhue2rgyw3OZ3Le0ZStANQ_-FXLIRhzim8vqyfrQz86oY8mI8aVGnOQ3Ypi68RvI81r8ql36c9ophSsR2FtStc51niYYt4zW45XAmavGtsG6z2ucZX2TNzSuU2_-ycTDeDP56lOAeBEJWEaQQ_FU3bd7sSbhnvsEZkDLPCMlrHzCfMBEA), a popular open-source package for this task.

**Numpy tutorial.**To help you get started with Numpy, we've created a simple tutorial that goes over all the Numpy operations you will need for this course: [numpy-tutorial.ipynb](https://eventing.coursera.org/api/redirectStrict/VttoMD3bbqDmhIGv-0xwotms_lDDQESdsZUSswUP0_48XCVF5OmwevrwcrXDrUP4HSldn4eeeszasdZm5iMdKA.fwRfIhipUnzro8trFPln1Q.Vl3jhWWmLInxlyXqbSiT0aHOsHcEUDD4uW2bSiaJ2K9luOZk2VslC6pey2heF8iA2eUp_wLzBqWyOufyc0amz-RgeiKWbI7kugSWrR3RJW5nIwVfbKDn1br9bOQqzzDVKqYw4M0nnTekWTobCDl6cJRz1zigBjbcPqf-PJyQFNVgSKwEW2Ptso9KfH0EBNxzCYhYrXehLySg8a_3vny8PqvGPwnXCHP03AFaAca1SemfAGmUd07xo-QRjigquJnxAGO2m0-otiv-uwbGvEdSHYowGuN88TJimyVwge9mMHZRaTiU6z1oZ0CzMSwuI_YThjHqmCMH10j-CPXL2I2qULdfaakZ6bO-f_448raXY1Ey6Ejp6sCmlNoJzwoIfX-qqgNpLTgTMmsr55BypG1VypLdssyIzD2WUSuQAmWLsodm0sUKNlRHqCzD3G19scqH). We strongly recommend you go over this tutorial, before going any further.

**More information on Numpy**, beyond this tutorial, can be found in the [Numpy getting started guide](https://eventing.coursera.org/api/redirectStrict/oLxth5T1E1Q5mcR0m__0_elR-UXEbr-_mZzqE0eBBZ0r7FxYVmALmzWJvFagVbvKZan88zGK7Ojmt5dhaXOb9g.9CD3ZJayegojGVJyHkXU6g.kGEpXKv7j_fcpBUFe-Njm2WeDwRnPpfAq9au1YKJ0dGW1qL7qjoRO8N8S9fM_Ost2Wi8_w441uu_Y-L9Y02yE7rCXPpP-UBwdinpUUrOYANtab_aCh66vikzs7atklQ71k93_fi5vhwUGcvMti8erb8r3thq31Vlw4Ec8xySftLTd5MOVxs4XviZ__iR0eNUuCM87DU5Q8k_XPHBHz6PGG-6S_AeYxNLl8vi44VqqSO3MWb3TbK4Q9rvoT69zc06SJK6fEDRq9Sn1SRnAIjJP5zSHICeL4If_oNw8_51Bvz1m6AR34-AX1uElQvg7yYPBGNWwp2cOTKG_faRNhwPwAqxBG0U1XjkNQW_6oDRSB0).

**Installing Numpy.**If you installed the [Dato Launcher](https://eventing.coursera.org/api/redirectStrict/X22QjJc_kTsYWEEfWumaSCxJ4dLv-KgqJqEEpTbbaG6325GGx7T8kBssoMnpGCr4Ecgne1NyOpzxc26IhwTUFg.xbcisRDlE3rPdvYoiECcMA.d_8Focqe_TJen5HLWpMSqn2Zrt4xBlenY096S6WvUEpYk5G-vRwPc1SOiMO8u_F1uKK8urwCIXdM2hN1vfMcI6lEIBsZrjP5_Khka5P2hWWNNd7vaJ1VH3hiWfqR4A196FAiu1NkSHVWNHM3dxq5BnToETCBzATooGyNSKXodqqBCG3WgmiTKI7KVfF34x-hbH8ZMPiFhpCfSE8HeTZG6huURkaaOHwLfwOYx-vM8buEe3q5LN5Y8uKUo6HxVECxv4CXdij2LVtXN8LdSNGaw_5UnK6Z4M9Vppg7x4lL_6Q) at the beginning of the course, you will automatically get Numpy. Otherwise, please [follow these instructions to install it](https://eventing.coursera.org/api/redirectStrict/hLY5C3IZoVoxZ4qOn041Ev_RbRh5c5ONCAadmGV7kNqAPmPcCMeeHjve5oKMCKO0aHco7evdfBwQ3EOGJVxNrA.KUBmjUJ-PNn-YgsczD7Xfg.fDZfwKkn2M9D7FGx7ButN0gbORWKZDzQQfE_V2eWLeK8LVe3u3JTwYaXeQZ-FFuT-tMFoQQ3x8X5wjsKsJC_fOwg0Q6ugLZektqP3wTutBuHTRavbKmcQp6jZ71cM2_42qCbF1Rtf0Pcvr2COzIhai33-EQSb4J1cAq5HXXwFyIERvfs1we3sxe1P5IYEc8SF1iAYtsLwhdLSwOAzfdGuKIsBc0Dp4MMhSUvWt_tn9UUZ_Y_EmujqyruZqFsXwU3BtXfV9WgPnrR202yVUfK3j0lDN711uAzLdEvO9V2kJDkXdduJ8l9RjGFZU06GWxT).