Arsenal F.C. Premier League Predictions

User Guide & Installation instructions

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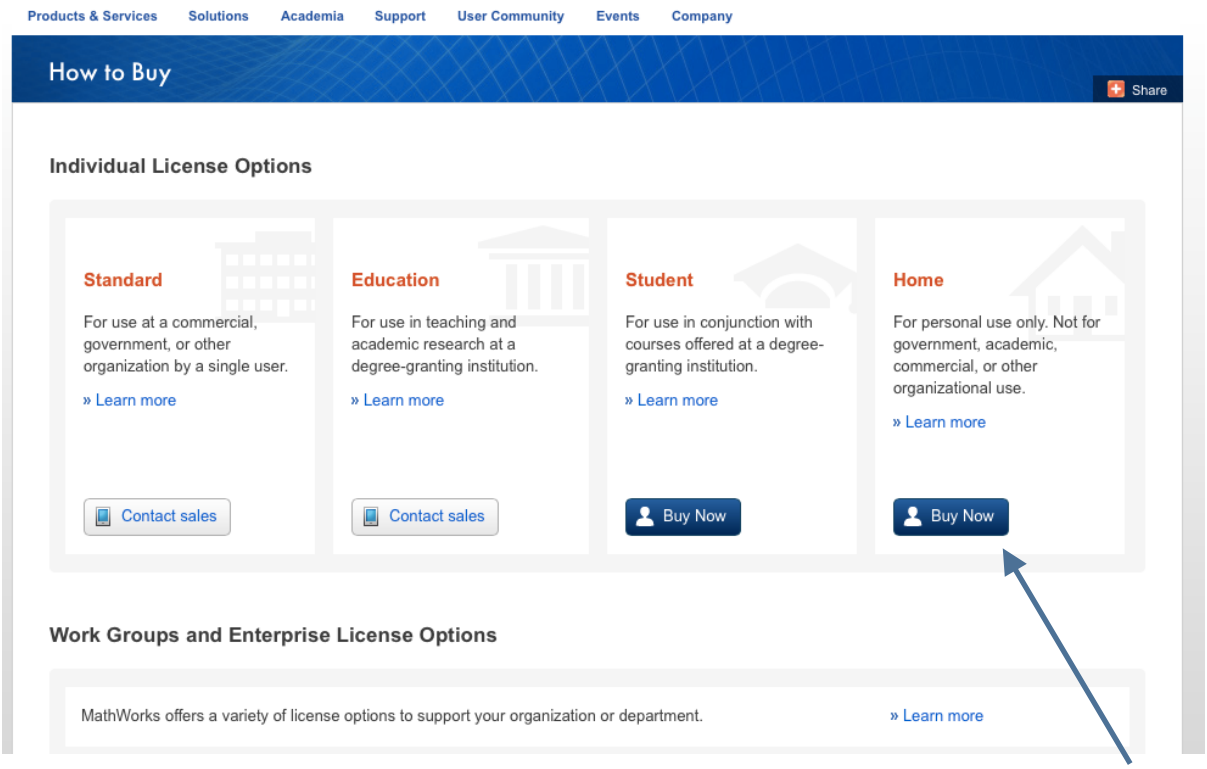
Release 1

1.Installing Matlab

Before you are able to use the Arsenal F.C. Premier League Predictions application, you must first install the Matlab programming tool. Matlab is available to download on the Windows, Linux and iOS Operating Systems.

Matlab is not an open source tool, therefore a license fee will be required to purchase the software tool. If you are a student or are employed at an academic institution, you may be able to acquire Matlab free of charge under your academic institution's license. For more information about this, speak to the IT administrator for your institute. You will also be required to purchase separate add ons should they not already be installed with your version of Matlab.

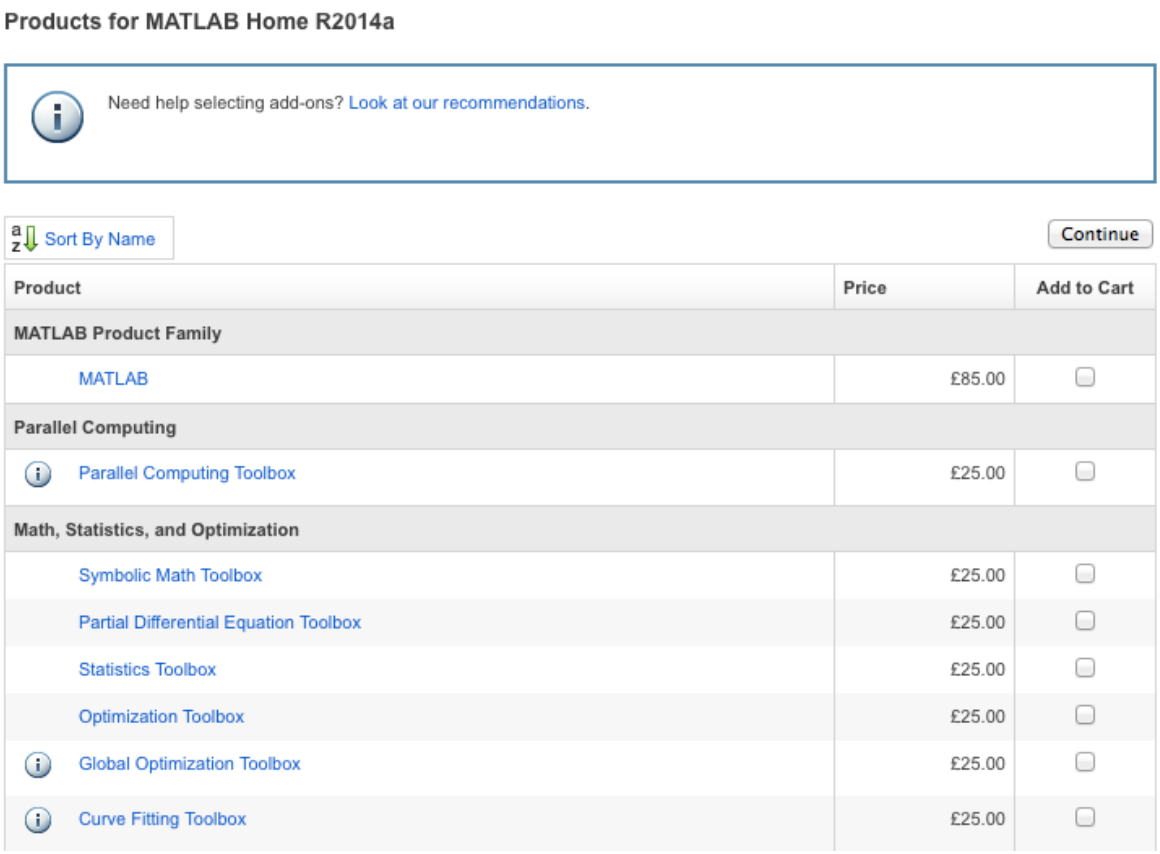
1. To begin with, navigate to www.mathworks.co.uk/store/index.do where



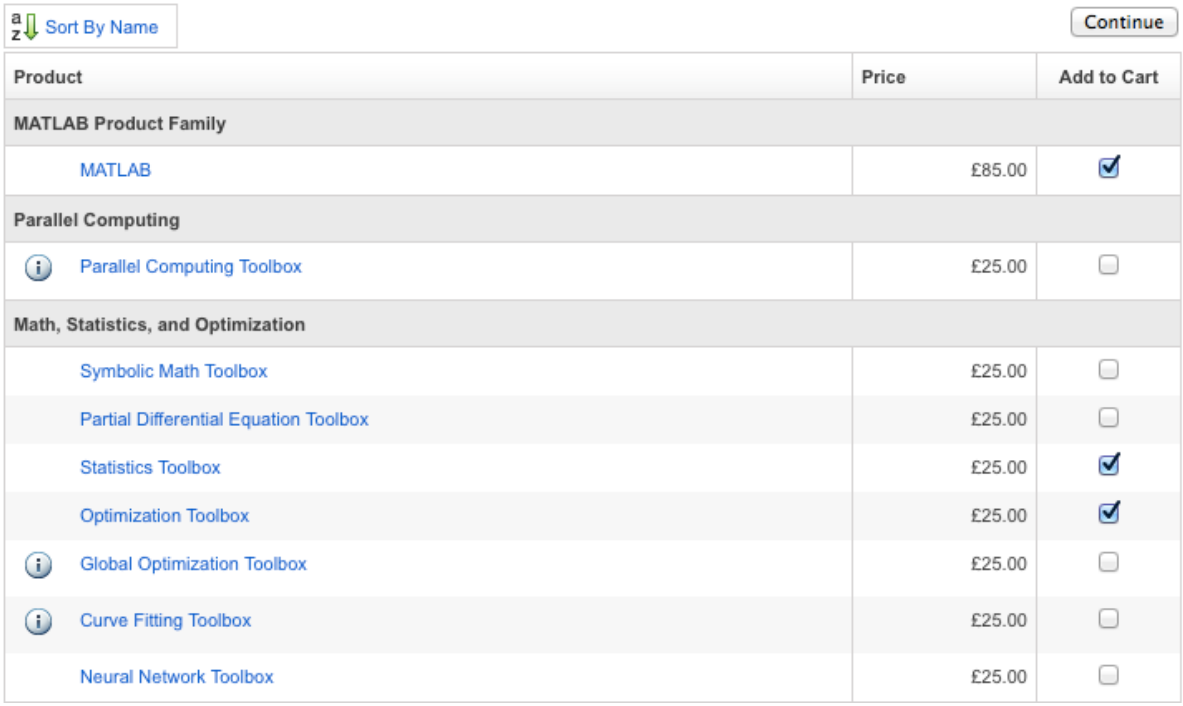
you'll be presented with the following screen:

2. If you are a student, it is recommended that you purchase the student version, else click the "Buy Now" button shown by the arrow in the image above.

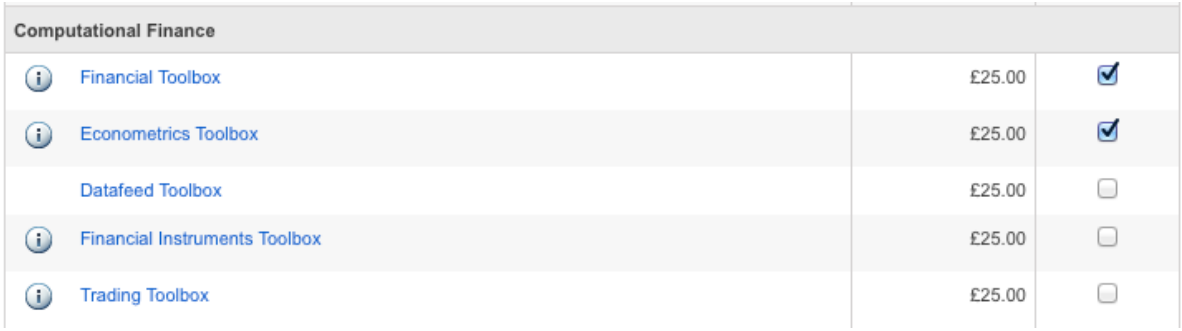
3. After you click either of the "Buy Now" options, you will be taken to the Matlab Product screen, similar to the one shown below (this is the product screen for Matlab Home version, however the Matlab Student Product screen is identical):



4. To purchase **Matlab**, 'tick' the checkbox next to the product. To use the Arsenal F.C. Predictions application, you will also be required to purchase

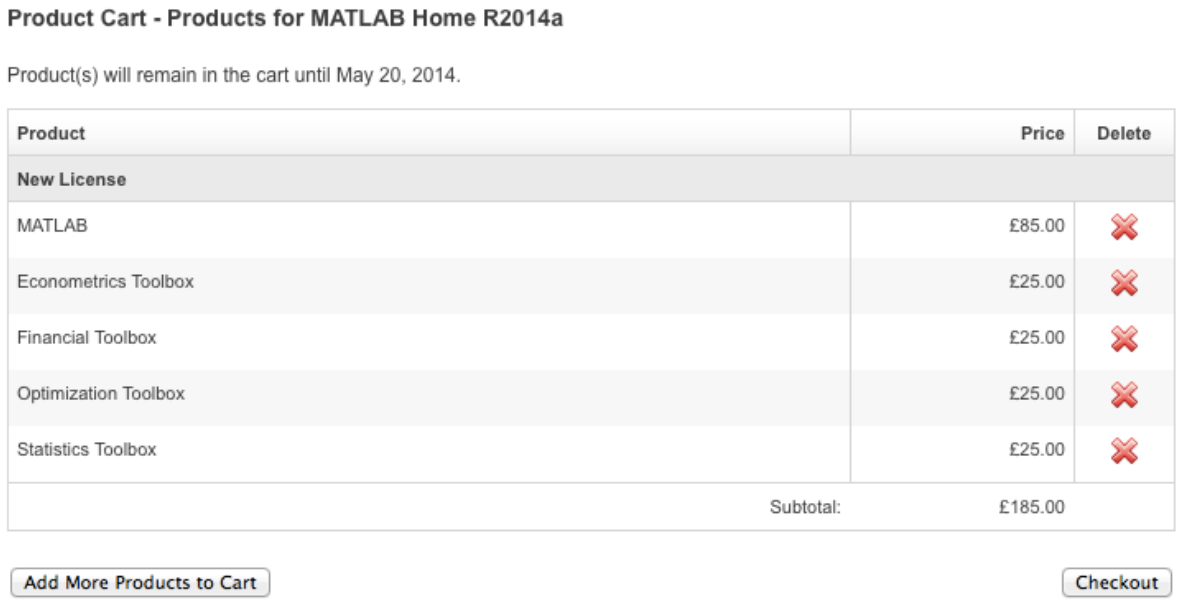


additional add-ons. The add-ons required are the **Statistics Toolbox** and the **Optimization Toolbox**, found under the heading, 'Math, Statistics and Optimization'. You will also need to purchase the **Financial Toolbox** and **Econometrics Toolbox**, found under the heading, 'Computational Finance'.



Computational Finance		
Financial Toolbox	£25.00	☑
Econometrics Toolbox	£25.00	☑
Datafeed Toolbox	£25.00	☐
Financial Instruments Toolbox	£25.00	☐
Trading Toolbox	£25.00	☐

5. Once all checkboxes for the required products and add-ons are 'ticked', click the 'Continue' button at the top of the screen.
6. Check that your 'Product Cart' is similar to the one shown below and click the 'Checkout' button and follow the instructions to proceed to payment, thus completing the purchasing stage.



Product Cart - Products for MATLAB Home R2014a

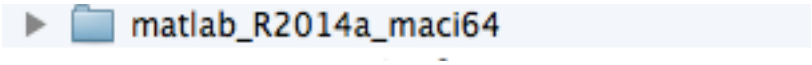
Product(s) will remain in the cart until May 20, 2014.

Product	Price	Delete
New License		
MATLAB	£85.00	✖
Econometrics Toolbox	£25.00	✖
Financial Toolbox	£25.00	✖
Optimization Toolbox	£25.00	✖
Statistics Toolbox	£25.00	✖
Subtotal:	£185.00	

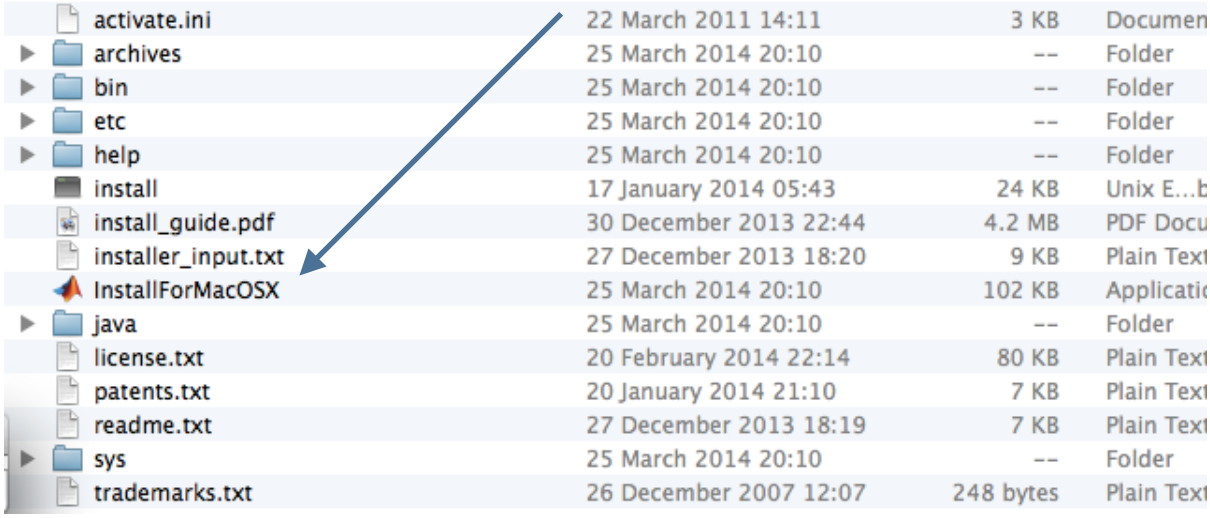
Add More Products to Cart Checkout

7. Once payment has been processed, your download of the purchased products, including add-ons will begin. Dependent on your download speeds, it should take less than 60 minutes for download to complete.
8. Once download is complete, navigate to the location where your downloaded files were saved to, dependent on your own settings, this may be

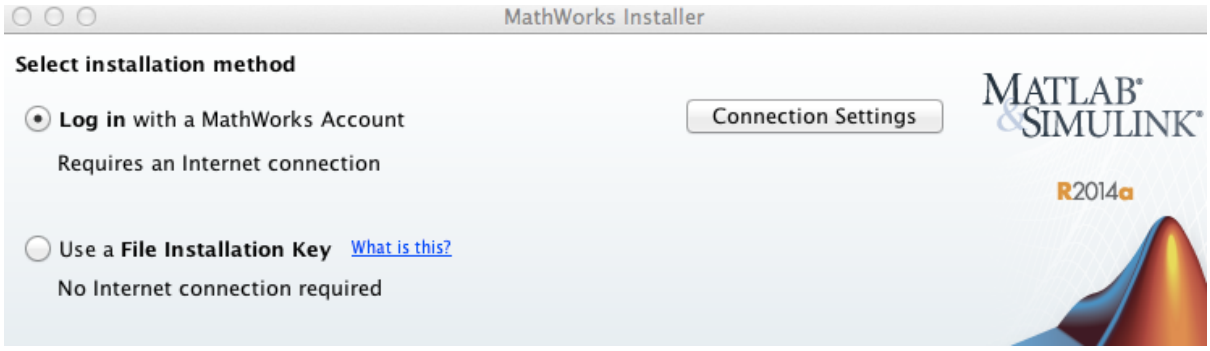
the 'Downloads' folder or 'My Documents' folder. This installation guide shows an example of the downloaded folder on the iOS Mavericks operating system. Dependent on the version of Matlab you have downloaded, you should see a folder similar to the one shown on the right. The version shown here is **Matlab Student version R2014a** for iOS 64x Operating System. This is the latest version of **Matlab** at the time of writing this installation guide (6th May 2014).



9. Open the folder and you will find files related to the installation of the version of **Matlab** you downloaded. **Run** the file called **'InstallForMacOSX'**, shown by the arrow below. Your file may be named slightly differently, dependent on the Operating System that you are using.

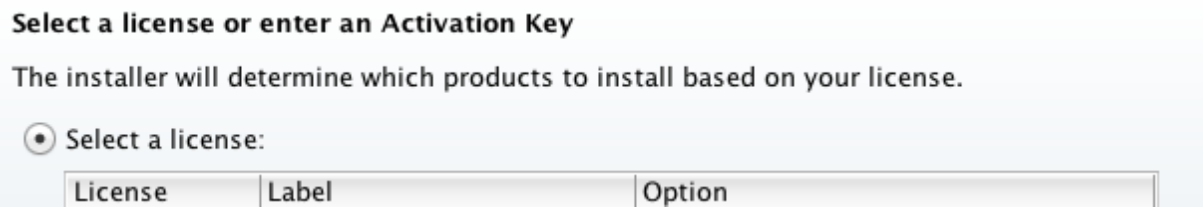


10. When you **run** the installer file, you will be presented with a screen containing two methods of installing the software. For a swifter installation,



it is recommended that you select the option selected in image above. Then click 'Next'.

11. Read the Terms & Conditions page before accepting and clicking ‘Next’.
12. You will be asked to log into your **MathWorks** account. This is the account which you used during the payment stage. Log into your account and click ‘Next’.
13. On the next screen, you will be asked to select the license file you wish to install. If the installed license is visible in the selection box, highlight it and click ‘Next’. If it isn’t, you will need to log into your **MathWorks** account



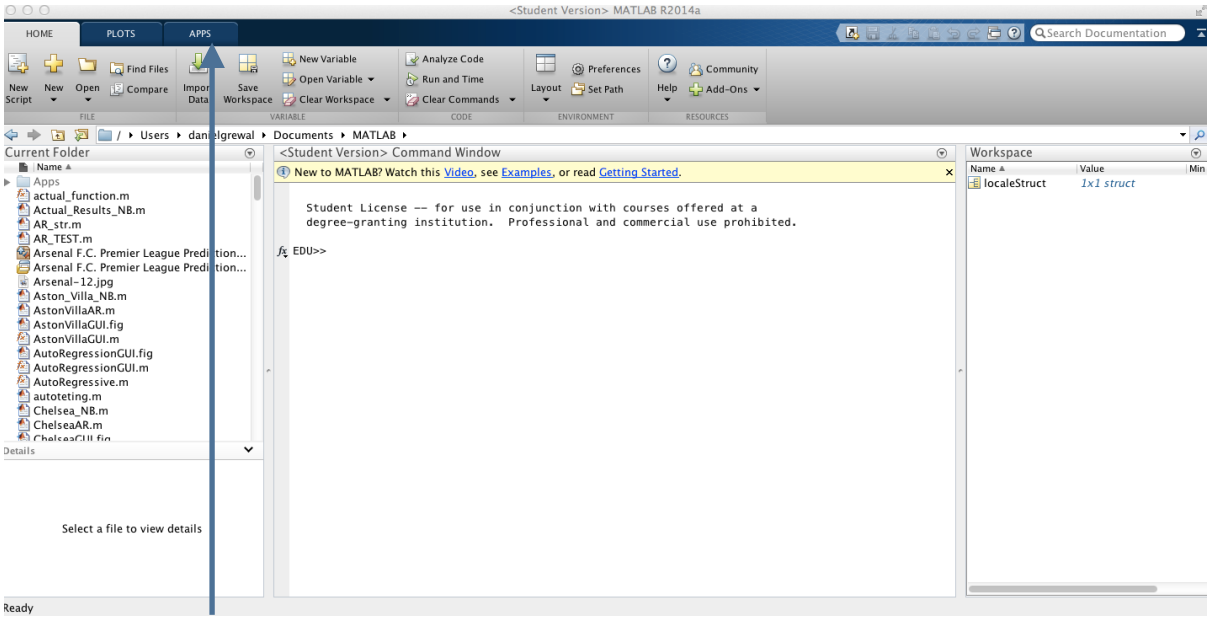
by visiting www.mathworks.co.uk and clicking the ‘My Account’ option in the top right-hand corner. If this option isn’t available, click the ‘Log In’ option which will be in the same place.

14. On the ‘My Account’ page, you will see the licensed software which you have purchased as well as the license **Activation Key**, this is the key which you must enter on the screen mention at instruction number 13.

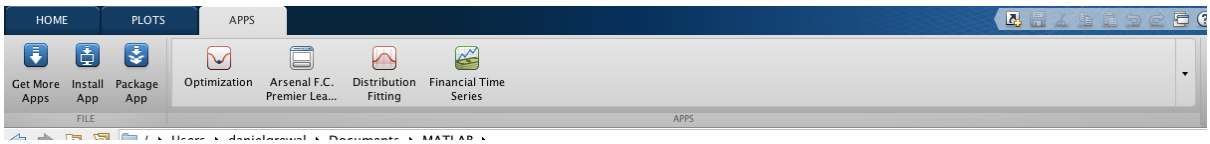
15. Once you have entered the **Activation Key** manually or selected it from the selection box and clicked the 'Next' button, the software will begin installing on your computer. Dependent on the speed of your system, this could take between 30-60 minutes. Once the installation is complete, click the 'Finish' button which will be shown and your software will have successfully installed on your computer. You can check this by navigating to where installed applications are stored on your computer, and looking for the **Matlab** application. The add-ons you selected to purchase will also install automatically when your **Matlab** software installs.

2.Installing Arsenal F.C. Premier League Predictions

1. Now that your software is successfully installed, open **Matlab** by navigating to the application on your computer and opening it.
2. Your screen will look like the image below. However your 'Current Folder' will be empty as you're yet to create any script or function files in **Matlab**.

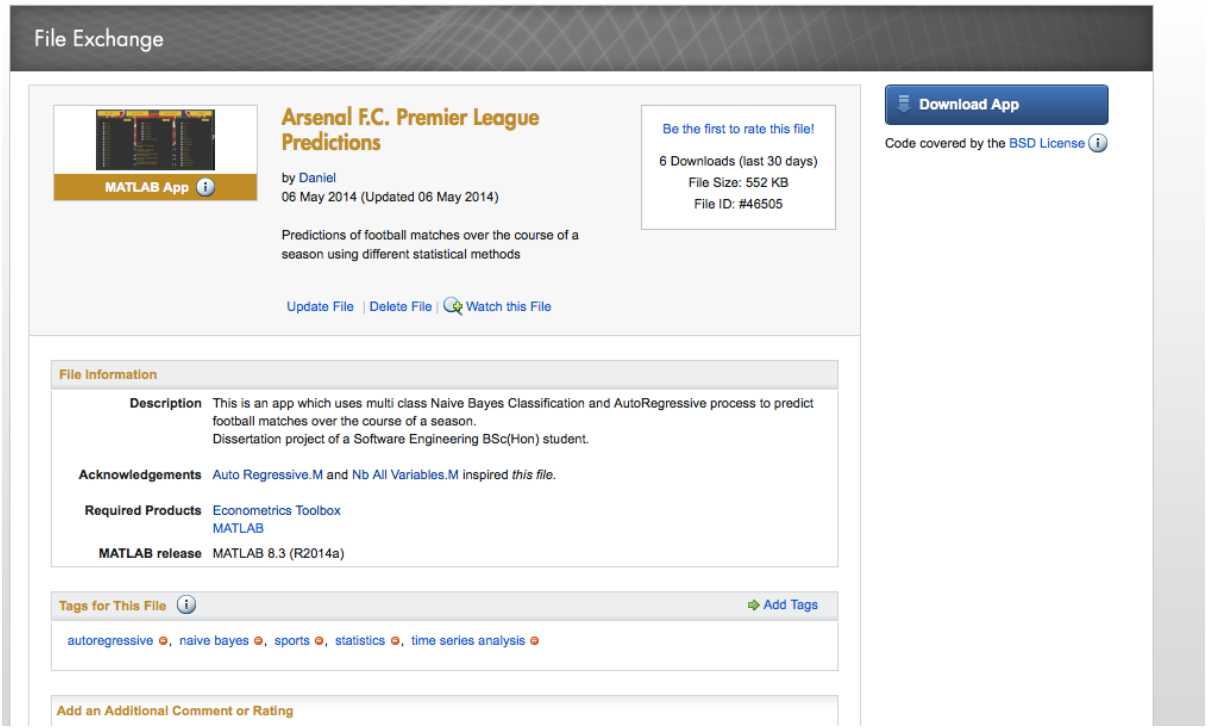


3. At the top of your screen, click the '**Apps**' tab.



4. Click the '**Get More Apps**' at the top left of the screen.

5. You will be taken to the following web address: www.mathworks.co.uk/discovery/matlab-apps.html. Click the '**Explore Apps on MATLAB File Exchange**' button near the middle of the page.
6. On the next page, type "**Arsenal F.C. Premier League Predictions**" in the search box provided, then click '**Search**'.
7. The result of the search will show the **Arsenal F.C. Premier League Predictions** application, click on the application.
8. You will now be on the page of the application to download, the page



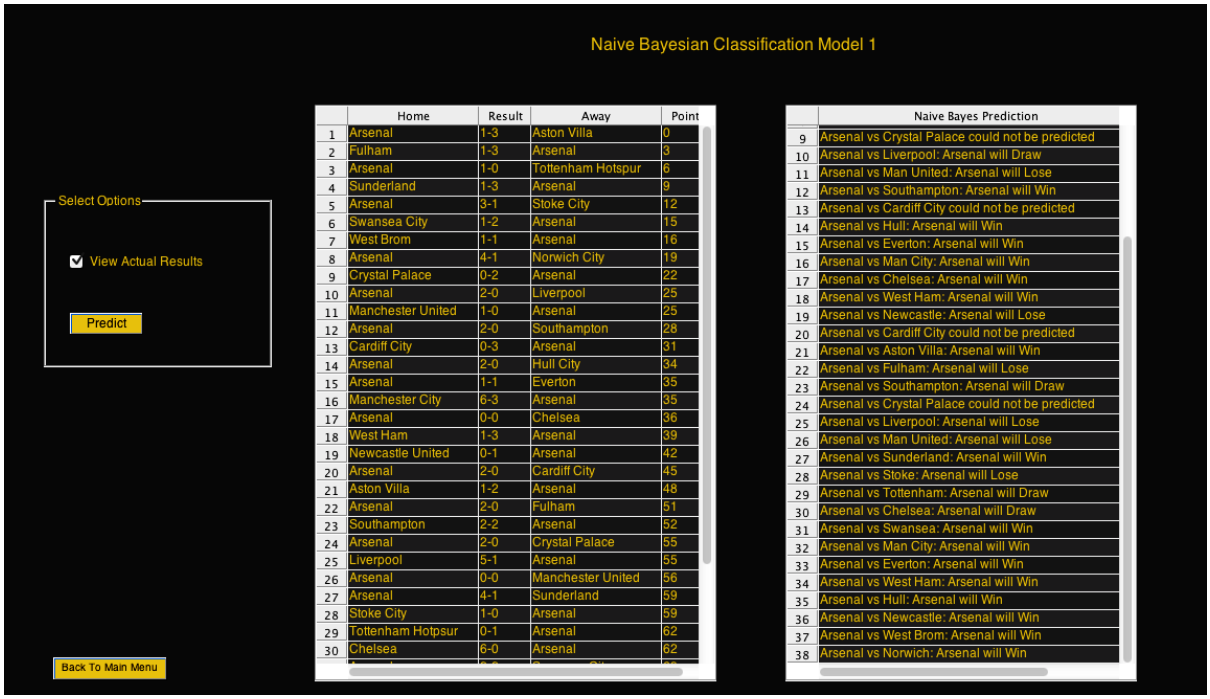
should look like the one shown above. Click the '**Download App**' button to begin downloading the application to your **Matlab** '**Apps**' tab. The download should only take a few seconds.

9. Go back to your **Matlab** application and click the '**Install App**' button on the '**Apps**' tab.
10. **Matlab** will automatically show the downloaded application file in your **Matlab** folder. Click the file called, '**Arsenal F.C. Premier League Predictions.mlappinstall**'.
11. The application should only take a few seconds to install, it will appear on your '**Apps**' tab. Click the application for the application to **run**.

3.Using Arsenal F.C. Premier League Predictions

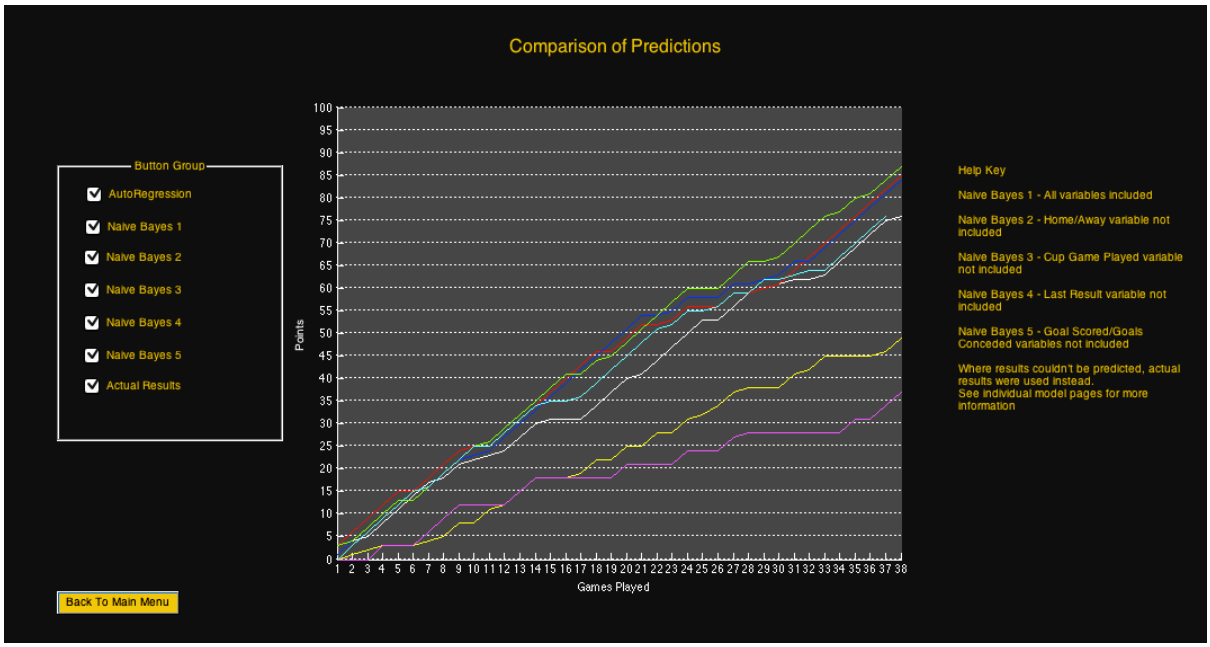
1. Open the application and you will be presented with the home screen.

   There are 4 menu choices to choose from. Click '**Prediction Setup**'.
2. A sub-menu will appear with the different prediction models to view, there is also an option to compare all prediction models. There is text at the bottom of the sub-menu explaining which variables have been included in each option. Click the '**Naive Bayes 1**' option.
3. You will be taken to a new screen which appears blank, accept for a few options to view **Actual Results** and to **Predict**. Click the checkbox next to '**View Actual Results**'.
4. A table appears showing the actual results for Arsenal F.C. during the 2013-2014 season, up until Game 37. The reason Game 38 is not included, is that this application was created before Game 38 was played. Game 38 will be updated within the application once the fixture has been played.
5. Next, click the '**Predict**' button, another table appears showing the predicted results using the **Naive Bayes 1 Model**. To understand what variables have been included with each feature set of the Naive Bayesian Classifier, refer to the **Naive Bayesian Classifier** Chapter of this user guide.
6. By using the two tables, you can compare the predictions against the actual results. **Please note**: Some fixtures couldn't be predicted as there was not



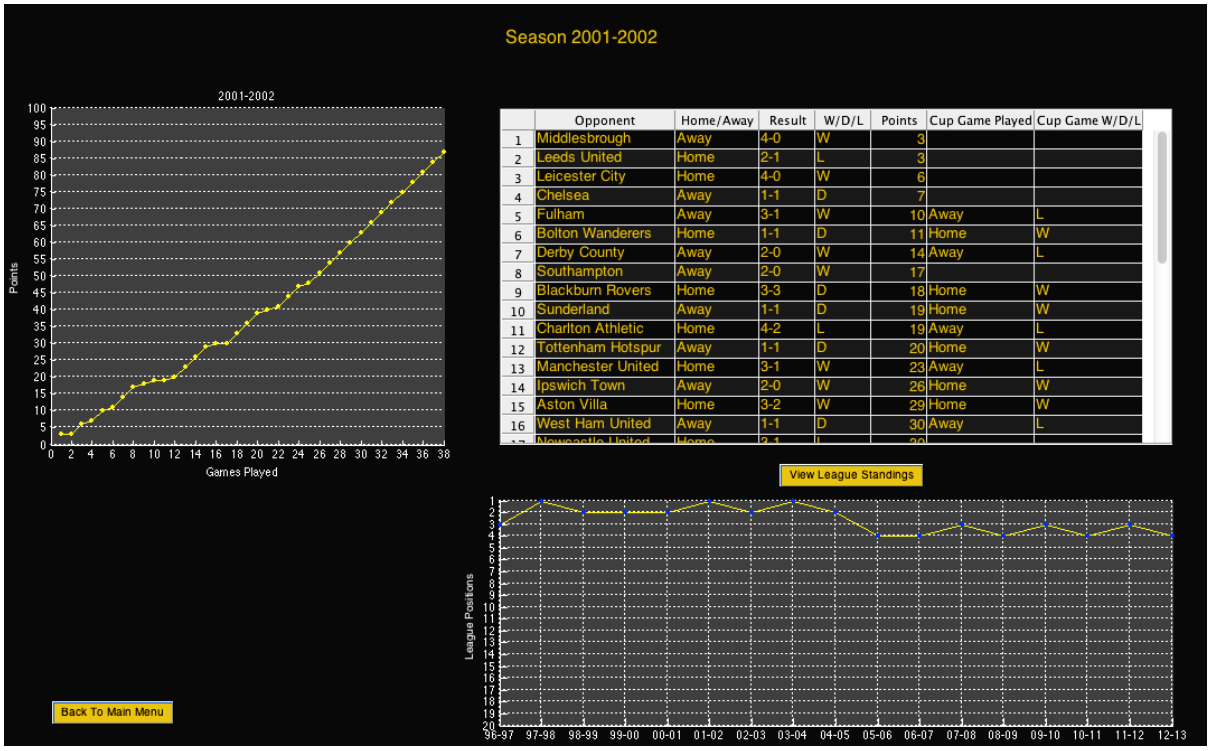
enough data to predict with. As this is an application whereby the data begins during the reign of Arsene Wenger, some opponents haven't competed against Arsenal F.C. enough during that period to predict fairly.

7. Click the '**Back To Main Menu**' button to go back to the home screen.
8. Click the '**Compare Prediction Models**' in the sub-menu on the home screen.
9. You will be taken to a screen showing a blank graph with options to select on the left-hand side. You can use these options to compare the prediction



models and the actual results. The graph will show 'points gained' against 'games played' for the 2013-2014 season.

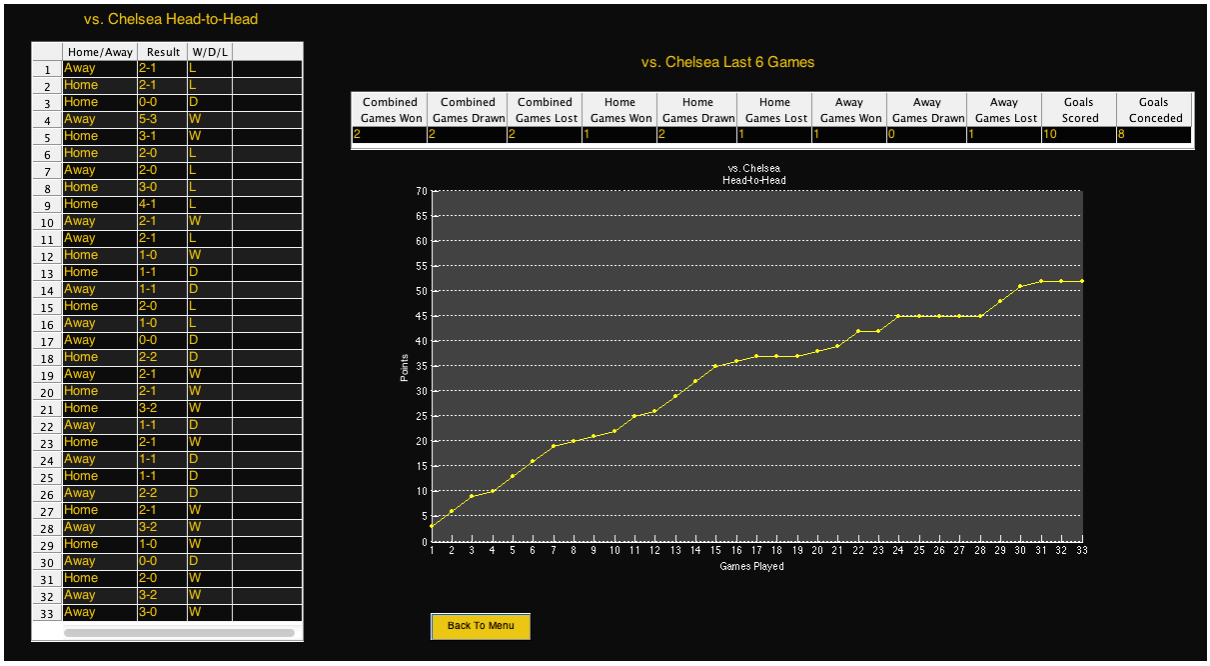
10. Click '**Back To Main Menu**'.
11. Click '**Exit**' on the sub-menu.
12. Click '**Premier League History**'.
13. A new sub-menu appears showing all the previous seasons during Arsene Wenger's managerial tenure at Arsenal F.C.. Choose any option you wish.
14. You will be taken to a new screen showing statistical analysis about Arsenal F.C. during that season. The graph on the left shows the points Arsenal F.C.



gained as the league progressed. The table on the right shows information about league fixtures including their opponent, whether the fixture was played at the Arsenal F.C. Home venue or Away, the result, whether Arsenal F.C. won, drew or lost the game, the points earn, whether or not Arsenal F.C. played a cup game prior to the league fixture and whether or not Arsenal F.C. won, drew or lost that league fixture. By clicking the '**View League Standings**' button, you can compare the final positions of Arsenal F.C. during each season, playing under Arsene Wenger.

15. Click the '**Back To Main Menu**' option.
16. On the home screen, **exit** the sub-menu.
17. Click the '**Opposition Form Guides**' option.

18. On the sub-menu, choose any option.
19. You will be taken to a screen with statistical analysis of the opponent you selected. Here you can view all the results against the opponent during the



reign of Arsene Wenger, as well as recent form and points gained against the opponent during Arsene Wenger's reign.
20. Click '**Back To Menu**'.
21. To exit the application, click '**Exit Application**'.
22. A dialog box will appear, click '**Yes**' and the application will close.

4.Important Notes about Arsenal F.C. Premier League Predictions

The application still has some minor work to be completed. For instance, the recent form guide's for some of the opponents aren't updated. This will be done in due course.

The application includes many files which aren't used in the application. These files have been included with the application package to demonstrate to my markers, how I stored data and analysed it during my project. I learnt how to make use of Matlab scripts and functions as I progressed through my project. I will remove some of these files and recode in places to improve the efficiency of the application.

5. Naive Bayesian Classification

Model	Attributes Included in Feature Set					
Naive Bayes 1	Home /Away	Cup Game Played Prior To League Fixture	More Goals Scored	Less Goals Conceded	Last League Fixture Result	Last League Fixture Against Higher/Lower Ranked Team
Naive Bayes 2		Cup Game Played Prior To League Fixture	More Goals Scored	Less Goals Conceded	Last League Fixture Result	Last League Fixture Against Higher/Lower Ranked Team
Naive Bayes 3	Home /Away		More Goals Scored	Less Goals Conceded	Last League Fixture Result	Last League Fixture Against Higher/Lower Ranked Team
Naive Bayes 4	Home /Away	Cup Game Played Prior To League Fixture			Last League Fixture Result	Last League Fixture Against Higher/Lower Ranked Team
Naive Bayes 5	Home /Away	Cup Game Played Prior To League Fixture	More Goals Scored	Less Goals Conceded		

Attribute/Class	Numerical Representation 0	Numerical Representation 1	Numerical Representation 2
Home/Away	Away	Home	
Cup Game Played	No	Yes	
More Goals Scored	No	Yes	
More Goals Conceded	Yes	No	
Last League Fixture Result	Lost	Drawn	Won
Last League Opponent Rank	Lower	Higher	
League Result	Lost	Drawn	Won

6. AutoRegressive Process

The AutoRegressive process is a univariate time series model. For this application, it is applied by focusing on previous results for Arsenal F.C. to predict future results. It has an order of 4 (AR (4) process) and the parameter values were pre-determined by myself.