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COUNT THE BASKET
Advanced Stats for Basketball
countthebasket@gmail.com

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Calculating Adjusted Plus/Minus

Posted by Eli in [Advanced Stats](#), [Plus/Minus](#)

Adjusted plus/minus is a way of rating players first developed by Wayne Winston and Jeff Sagarin in the form of their [WINVAL](#) system (more [here](#)). The basic idea is simple. For each player, it starts with the team's average point differential for each possession when they are on the court (sometimes referred to as the player's on-court plus/minus). This gives a number showing how effective the player's team was when they were in the game. The problem with using this to evaluate individual players is that it is biased in favor of players who play alongside great teammates (and players who play against weak opponents). This can be seen by looking at the 2007-08 leaders in on-court plus/minus, which can be seen [here](#) (the Overall Rtg, On column) or [here](#) (the On Court/Off Court, On column). Kendrick Perkins rode his teammates' coattails to the second highest mark in the league. Adjusted plus/minus uses [regression analysis](#) to control for these biases by controlling for the quality of the teammates a player played with and the opponents he played against.

That sounds easy enough, but it's actually kind of complicated, and the specifics of WINVAL were never made public (Mark Cuban reportedly was paying a handsome sum to use the system for the Mavs). Thankfully, in 2004 [Dan Rosenbaum](#) spelled out the details of the methodology in an [article](#). He called his version adjusted plus/minus, and released a series of analyses using the metric ([here](#) and [here](#)). Eventually Dan was hired to consult for the Cleveland Cavaliers, but because he had spelled out the methodology others were able to duplicate his work for future seasons. [David Lewin](#) published rankings for the [2004-05](#) and [2005-06](#) seasons, and [Steve Hlardi](#) and [Aaron Barzilai](#) have done the same for the [2006-07](#) and [2007-08](#) seasons (up-to-date ratings can be found [here](#)).

I always wanted to try to calculate adjusted plus/minus on my own, but I was intimidated. I figured that I didn't know enough about running regressions and that I didn't have the data, software, or computing power to run such a large analysis. But I finally sat down and tried to do it a few days ago, and I discovered that it's not that difficult. Using Dan Rosenbaum's [description](#) of his method, publicly available data from [BasketballValue](#), Excel 2007, and the free statistics program [R](#), I was able to set up and run the whole thing in less than an hour. Here's how I did it.

Getting the software

I used Excel 2007 to set up the data. Unfortunately, I don't think an earlier version of Excel (such as Excel 2003) will work because previous versions were limited to 256 columns, and we'll be working with a big table with over 300 columns (basically one for each player in the league). I haven't really looked into ways of getting around this issue if you don't have Excel 2007. It's probably possible to do the data setup in a database program, in R itself, or through some scripting. If anyone has an ideas on this please let me know.

I used R to run the regression. I used R because it's free, but I'm sure other [programs](#) like SPSS, SAS, Stata or Minitab would work as well. I'm not going to get into the details of installing R, but I will point to the [R for Windows FAQ](#) and the [download page](#) for the latest version.

Getting the data

Thanks to Aaron Barzilai's fantastic site [BasketballValue](#), the raw data needed to calculate adjusted plus/minus is readily available in an easy to use format. The key is having play-by-play data grouped into stints by the lineups on the court. The file we want is labeled "List of each matchup of one unit against another" on this [page](#). Download the one from the 2007-08 regular season (matchups20080417.zip). While you're there also download the "Statistics of all players across all teams played for" file (playerstats20080417.zip). Unzip both of these files.

Setting up the data in Excel

Open a new Excel spreadsheet. Go to the "Data" tab and select "From Text" in the "Get External Data" section. Navigate to wherever you saved the unzipped matchups200804170110.txt file, select it, and click "Import". Make sure "Delimited" is selected and click "Next". Make sure "Tab" is selected and click "Next". Click "Finish" and then click "OK". This will import 35459 rows with data in columns A through AU.

In cell AV1 type "HomePlayers" and in cell AW1 type "AwayPlayers". In AV2 type this formula:

```
= "P"&F2&" , P"&G2&" , P"&H2&" , P"&I2&" , P"&J2&" , "
```

Double-click on the bottom right corner of the cell to autofill this formula into all of the cells in the column. In AW2 type this formula and then autofill it down:

```
= "P"&K2&" , P"&L2&" , P"&M2&" , P"&N2&" , P"&O2&" , "
```

These will be used to quickly check whether a given player was on the court for a particular stint.

In AX1 type "MARGIN". In AX2 type this formula and then autofill it down:

```
=100*( IF (AH2=0, 125002/114854, AD2/AH2) - IF (AI2=0, 120811/114896, AE2/AI2) )
```

This is basically PointsScoredHome/PossessionsHome minus PointsScoredAway/PossessionsAway, which gives us the per-possession plus/minus of the lineup that was on the court for the home team. The complications come from stints in which one of the teams had zero possessions. In those cases we substitute the league average home (or away) team points per possession, which is what 125002/114854 and 120811/114896 represent (I got those four numbers by simply summing the PointsScoredHome, PossessionsHome, PointsScoredAway, and PossessionsAway columns). I'm not completely sure this is what should be done when one lineup has zero possessions, but it was the best sense I could make of Rosenbaum's [footnote](#).

At this point you may notice that this new MARGIN column has similar values to the OverallRtgHomevsAway column (AL), which is equal to OffensiveRtgHome (AJ) minus OffensiveRtgAway (AK). The reasons I didn't just use the OverallRtgHomevsAway column are because it doesn't have the adjustment for zero possessions detailed above, and because it contains some screwy numbers that I can't explain. This can be seen in the very first row, where PointsScoredAway is 5 and PossessionsAway is 14, yet OffensiveRtgAway is 33.3333 (rather than $100 \times (5/14) = 35.7143$). I don't know if this is just an error in Aaron's data or what, but as a result I decided to calculate things on my own.

Now that we have the dependent variable (MARGIN) for each observation, we have to set up the independent variables. Basically, every player in the league is an independent variable, other than those players who are excluded due to playing low minutes (these players become the [reference players](#) relative to which all other players' adjusted plus/minus is calculated). So we first have to decide what our minutes cutoff will be. In his initial work Rosenbaum used 250 minutes over two seasons as his cutoff. Others have used 500 minutes in one season. For the purposes of this example I will use the cutoff used by Aaron Barzilai and Steve Ilardi of only those players who were in the top 75% in the league in minutes played. For 2007-08 this works out to a cutoff of 388 minutes, with 339 of the 467 players in the league qualifying and the other 128 serving as the reference players (I know this doesn't come out to exactly 75%, but it's the players that BasketballValue uses so it's what I will use).

Here's where that other file we downloaded comes in handy. Go to Sheet2 of the spreadsheet and then go to the "Data" tab and select "From Text" in the "Get External Data" section. Import the playerstats200804170110.txt file following the same steps as were described above to import the matchups200804170110.txt file. Once this is imported, if you scroll all the way over to the AdjustedPM column (AL), you'll see that non-qualifying players are listed as "NULL". Click on AL1 and sort the column A to Z. Scroll back over and insert a column immediately to the left of column B (right-click on "B" and select "Insert"). In this new column, type "PID" in B1. In B2 type the formula `=P"&A2` and then autofill this down. Scroll back over to column AM and scroll down until you find the last row with a value (before all the NULLs). This should be row 340. Scroll back over to column B. Click in B340, hold, and drag all the way up to B2. Hold down the Control key and hit C to copy the selected cells. Go back to Sheet1 of the spreadsheet and click in cell AY1. Go to the "Home" tab and click on the arrow below "Paste" in the "Clipboard" section. Select "Paste Special" and then select "Values" in the top section and "Transpose" in the bottom right before clicking "OK". This will create the column headers for each independent variable, the 339 qualifying players (it doesn't really matter what order they're in, since we can identify them by their BasketballValue PlayerID number). At this point you should definitely save the spreadsheet, if you haven't been doing so already.

While we're working with the playerstats data, we'll set something else up that will come in handy later when running the regression in R. Go back to Sheet2 and insert a column immediately to the left of column C (right-click on "C" and select "Insert"). In C1 type `fit.adj0708 <- lm(adj0708$MARGIN ~` (not including the quotation marks). In C2 type the formula `=adj0708"&B2"&"+"` (including all the quotation marks and the space in the middle), and then autofill it down. Select column C, hit Ctrl-C to copy and then go to the "Home" tab, click the arrow below "Paste", and select "Paste Values". Click in cell C1 and drag down all the way down to cell C340 (but no further). Hit Ctrl-C to copy, then go to Sheet3 of the spreadsheet, go to the "Home" tab, click the arrow below "Paste", and select "Transpose". Immediately hit Ctrl-C to copy, then open Notepad (Start -> Run -> notepad) and paste (Ctrl-V). Scroll up to the top, and select the blank space between the tilde (~) and the "a" in `adj0708$P235`. Hit Ctrl-C to copy. Go to the "Edit" menu, select "Replace", and hit Ctrl-V to paste into the "Find what" box (it will look like some blank space got pasted in). In the "Replace with" box type a space, and click the "Replace All" button. Then click "Cancel". Click at the very bottom of the file which should put the cursor at the start of a blank line. Hit "Backspace" three times (which should put the cursor right after `adj0708$P732`), then type a comma, then a space, and then `weights=adj0708$Poss)` (not including the quotation marks). Save this text file, as we will need it later (if for some reason you can't get this to work, you can download a completed version of the text file [here](#)).

This next step is the most computer processor-intensive of the whole process. For each stint we have to code each player as either being on the court for the home team in that stint (1), on the court for the away team (-1), or not on the court (0). This can be automated by a simple Excel formula, but then that formula has to run on over 12 million cells (339 x 35458). So before you do this, make sure you've saved the spreadsheet and that no other programs are running. This is probably a reason why the data setup should be done in a database program like MySQL rather than Excel, but oh well.

In AY2 type the following formula:

```
=IF(ISNUMBER(FIND(AY$1&"",",", $AV2)),1,IF(ISNUMBER(FIND(AY$1&"",",", $AW2)), -1,0))
```

Click on the bottom right corner of AY2, hold, and drag all the way over to the right until you reach the last column (NY). At this point you could double-click on the bottom right corner of NY2 to autofill down for all the columns, but I wouldn't recommend it unless you have a very fast computer. Instead, I'd recommend splitting the columns up into chunks depending on your processor speed. Scroll back over to column AY, click in AY2 and drag over to the right about 10 cells. Then double-click on the bottom right corner of the right-most cell you selected and wait for it to autofill. This will give you a sense of how long the process will take. While Excel is working you might see a green progress bar in the bottom right of the screen, or the screen could appear to freeze with the Excel title bar saying that the program is "Not Responding". Just ignore this and wait until it completes (if it never does, you can try to abort by pressing the "Break" key on the keyboard (usually it's near the top right) or by using Ctrl-Alt-Delete to kill Excel). Once the autofill is done, before clicking anywhere else (while all the cells are still selected), hold down the "Control" key and hit "C." Then go to the "Home" tab and

click on the arrow below “Paste” in the “Clipboard” section. Select “Paste Values”. This also may take a little time to complete. If you did all that and your computer didn’t freeze, you can try a larger chunk. For me, 50-column wide chunks worked well. I selected the next 50 cells in row 2, autofilled them down (which took about 30 seconds), copied and pasted values (another 10 seconds), saved the whole file, and then went on to the next 50 columns. If 50 columns seems like pushing it, you could do 25 at a time. Overall there are 339 columns that have to be autofilled. Once you finish and save the file the filesize will be almost 50 megabytes.

If your computer doesn’t agree with all that, you could set up the data in a database program, or just download this [file](#) I created that has all the work done for you (including the step described in the next paragraph).

Now we have all the values for the independent variables. All we have to do now is clean up the spreadsheet and save the data we need to a CSV file. First select the MARGIN column (AX), hit Ctrl-C to copy, and go to Paste Values to paste (as described above). Next, select column AY, right-click on the AY heading, and select “Insert” to insert a column. In AY1 type “Poss”. In AY2 type the formula =AH2+AI2, and then autofill down. Select this newly created column, hit Ctrl-C to copy, and go to Paste Values to paste. This created a column of cells telling us how much each stint should be weighted (which is by the total number of possessions).

Save the spreadsheet. Then select all the columns from A to AW, right-click in one of the column headings (e.g. A) and select “Delete”. Do NOT click save after this. Instead, go to “Save As” -> “Other Formats” and in the “Save as type” dropdown select “CSV (Comma delimited)”. Name the file “adj0708” and click “Save”. Excel will warn you that you can’t save multiple sheets, click “OK”. It will then warn you that there may be incompatible features, click “Yes”. You can now exit Excel (it will ask you whether you want to save changes to the CSV and you should say “No”). The CSV you created should be around 25 megabytes. Again, here’s a download [link](#) to the CSV that I created by following these steps - you can use it as a point of comparison if you want.

Running the regression in R

Now we have to import the CSV we created into R. To do this you’ll need the full path to wherever you saved the CSV file. The only trick is that when entering the path in R you should replace all the back-slashes (\) with forward-slashes (/). Enter the following command into R (replacing the path as necessary) to load the data into a table called “adj0708” (it may take a minute to read the file):

```
adj0708 <- read.csv(file="c:/directoryname/adj0708.csv")
```

Next we have to enter the details of the regression we want to run. The basic format for using the [lm\(\)](#) function is this:

```
RegressionName <- lm(TableName$DependentVariableColumn ~
  TableName$IndependentVariable1Column + TableName$IndependentVariable2Column + ... ,
  weights = TableName$WeightsColumn)
```

Here’s where that [text file](#) we created earlier comes in handy. It contains the exact command to enter into R to run the regression. Open the file, hit Ctrl-A to select all and Ctrl-C to copy. Go to the R command prompt and hit Ctrl-V to paste. You will see it paste everything in character by character. Once it has finished, hit enter, and the regression will run. This should take under a minute.

Once that’s complete, enter the following two commands to output the results of the regression to a file called results.txt in the R files directory:

```
sink("files/results.txt")
summary(fit.adj0708)
```

Viewing the results

Open the results.txt file which should be in your R files directory. First you'll see the formula for the regression. Next is the coefficients section. Select this whole section (starting at the beginning of the line below "Coefficients:" and ending just before the "—" line) and copy it. Open a new Excel spreadsheet and paste in the selection. Go to the "Data" tab and select "Text to Columns" in the "Data Tools" section. Make sure "Fixed width" is selected and click "Next". In the Data preview section insert a line by clicking just after the right parenthesis in Pr(>|t). Click "Next", then click "Finish". In A1 type "PlayerCode" and in F1 type "Signif". Go to Sheet2 of the spreadsheet then go to the "Data" tab and select "From Text" from the "Get External Data" tab. Navigate to the playerstats200804170110.txt file that we downloaded and unzipped earlier and click "Import". Make sure "Delimited" is selected and click "Next". Make sure "Tab" is selected and click "Next". Then click "Finish" and then "OK". Go back to Sheet1 of the spreadsheet. Right-click on the "B" column heading and select "Insert". In B1 type "Player". In B2 type the following formula and then autofill it down:

```
=VLOOKUP(VALUE(RIGHT(A2,LEN(A2)-9)),Sheet2!A:AM,2,FALSE)
```

Click on cell C1 and then sort Z to A. This will sort all players by their adjusted plus/minus. The magnitudes will be greater than those on BasketballValue because they center their results around the league average. To do this first right-click on the "C" column heading and select "Insert". Type "Minutes" in C1. In C2 type this formula and then autofill down:

```
=IFERROR(VLOOKUP(VALUE(RIGHT(A2,LEN(A2)-9)),Sheet2!A:AM,4,FALSE),"")
```

Next right-click on the "E" column heading and select "Insert". Type "Centered" in E1. In E2 type the formula =D2-SUMPRODUCT(D\$2:D\$341,C\$2:C\$341)/SUM(C\$2:C\$341) and then autofill it down (sumproduct(adj,min)/sum(min) is the minutes-weighted league average). This gives the final results, which should be close to the listings on [BasketballValue](#) (which are also listed in column AL on Sheet2). I'm not sure why the numbers aren't identical - it may have something to do with the weird values in OverallRtgHomevsAway that I discussed earlier. Regardless, here's the top ten that I got (which hopefully matches your results if you followed the steps outlined):

Player	Adj +/-	StErr
-----	-----	-----
Amir Johnson	13.57	6.53
Dwight Howard	12.71	10.12
Ronnie Price	12.18	6.73
Antawn Jamison	11.89	5.00
Thaddeus Young	11.86	3.96
Peja Stojakovic	11.85	5.52
Chris Bosh	11.64	4.13
Kobe Bryant	11.60	5.16
Manu Ginobili	11.56	3.63
Jamal Crawford	10.08	4.71

What's next

I need to figure out how to separate this into offensive and defensive adjusted plus/minus. I'm not sure how to do this. Running a different regression using ORtg (or DRtg) as the dependent variable instead of MARGIN would seem to make sense, but the problem is that the independent variables would have to be a mix of player adjusted offensive +/-'s and opponent adjusted defensive +/-'s (but of course these would have to change for different observations). Using MARGIN as the dependent variable but doubling the number of independent variables (with each player having one entry for their offense and one for their defense) doesn't seem to work either. Dan Rosenbaum's original [article](#) suggested that he combined adjusted plus/minus with efficiency ratings to get separate offensive and defensive ratings, but I'm not sure exactly what he meant by that. Anyway, if anyone has any ideas, let me know. Once I figure out how to split things up I should also be able to calculate adjusted rebound rates (really adjusted on-court team offensive and defensive rebounding percentages). BasketballValue has the data needed to calculate those but again I'm not sure of the methodology.

I also hope to regress boxscore stats (and some other advanced stats) onto these adjusted plus/minus results to calculate my own weights for statistical plus/minus.

95 Comments »

1. Nice article. You know what would be nice? Some cool graphics and pictures of players getting slam dunks and stuff, and maybe for controversial topics have a picture of players arguing with the refs.

Comment by [Tim](#) — [June 1, 2008](#)

2. Ha! Thanks for the suggestion Tim.

Comment by [Eli](#) — [June 1, 2008](#)

3. I never realized you could fit adjusted +/- with `lm()`. I thought some weird variant of `glm()` would be needed. This will be a handy bookmark to have.

Comment by [Ryan J. Parker](#) — [June 2, 2008](#)

4. I think the problem you're having with separating the defensive and offensive values is that in addition to doubling the number of independent variables, you should also think of each data line as *two* observations: rather than using MARGIN you should write two linear relationships: one using the home team offensive ratings and the away team defensive ratings to approximate the home team efficiency during that "mini match-up", the other replacing "home" and "away". Given the noisiness of the usual calculation you will probably need to increase the number of reference players.

Comment by [Lior](#) — [June 2, 2008](#)

5. Ah, so maybe two separate regressions, one with ORtg as the dependent variable and one with DRtg, each with twice as many independent variables? That sounds like it might work. In the Home ORtg one, the five home offensive players would get a 1, the five away defensive players would get a -1, and the five home defensive players and the five away offensive players would all get a 0. I'll try that out later. (Or maybe you're saying there should be one regression but with the number of observations doubled?)

Comment by [Eli](#) — [June 2, 2008](#)

6. Eli, what I've done is what Lior suggested, a single regression, twice the independent variables, twice the observations. And you need to think about what the neutral ORtg is, and how to insert home advantage into the model (a dummy variable should suffice for this).

Regarding using a script to create the observations, that's what I do, and it's way faster than Excel (what takes the most time in my computer is the actual regression, I blame it to memory issues). At

<http://sonicscentral.com/apbrmetrics/viewtopic.php?p=10823>

you can see a Perl script I used for 2006 data. With little changes, it can handle the current basketballvalue format. I may post the updated script later.

Comment by [cherokee_acb](#) — [June 2, 2008](#)

7. Thanks for the transparency of your work here, it is really refreshing. Sagarin & Winston were charging something astronomical just to get the details of how they calculated their ratings.

Comment by [JTapp](#) — [June 2, 2008](#)

8. Great work, Eli... I'm bookmarking this page for the day when I finally take the plunge and try it for myself. :)

Comment by Neil — [June 2, 2008](#)

9. Eli,

When adjusting the ratings so league average is zero you want to use the minute weighted average, so that the average minute played has an adjusted plus-minus of zero, not the average player.

Comment by Dave Lewin — [June 2, 2008](#)

10. Thanks Cherokee, I'll try that.

That makes sense, Dave. I'll update the post with that alteration. Though any centering is going to be somewhat arbitrary regardless.

Comment by [Eli](#) — [June 2, 2008](#)

11. Another tip worth mentioning is that if when creating the CSV you use all players rather than just the qualifying (non-reference) ones, then you can later run regressions with different minutes cutoffs just by changing the regression formula you use (which is a lot quicker than having to rebuild the CSV over again).

Comment by [Eli](#) — [June 2, 2008](#)

12. I've just found that I don't have an up-to-date script valid for the 2008 season format. If I decide to write it, I'll share. I'll offer another tip instead: in R, use "as.formula" and "paste" (see an example in the APBRmetrics thread linked above) to dynamically construct the regression formula from the data.

Comment by [cherokee_acb](#) — [June 3, 2008](#)

13. I visited multiple web sites however the audio quality for audio songs present at this web site is genuinely excellent.

Here is my web blog: celebrity wear (pinterest.com)

Comment by pinterest.com — [June 22, 2013](#)

14. Most of the retail and Prada thorough bags are accessorized are created all the more desirable with metallic buckles in many different finishes, green hearts, and timber accents. The wooden appear is very in for your 2006 option with wood pieces acting as accents, serving as the Prada logo, and also working as handles and straps. The majority of another big designers including Gucci and Dior purses are utilizing the timber accessories, so you are going to actually consider fashion with Wholesale Prada handbags that include wooden accents.

nike air max bw pas cher <http://www.auberge-la-gaillotiere.fr/achat-chaussures.asp?id=nike-air-max-bw-pas-cher>

Comment by [nike air max bw pas cher](#) — [January 15, 2014](#)

15. The dog worry aggression elimination ebook bought from a larger retail stores could possibly not be as specific as you desire to, especially in case you are in search of data about a chosen methodology of canine aggression elimination which may be considered to be unproven. In plenty of instances, these publications are intended for folks who merely desire a basic e guide for quickly instructing their canines to be much less ambitious and much less fearful in each day scenarios. You will discover lots of diverse kinds of those textbooks out there and these publications are developed merely so that the particular individual might be effective at only comprehend the canine worry aggression elimination ebook and be able to teach for their canines successfully..

air max pas chers <http://www.biguebuggys.net/baskets-nike.asp?id=air-max-pas-chers>

Comment by [air max pas chers](#) — [January 15, 2014](#)

16. You really make it appear so easy with your presentation however I find this matter to be really one thing which I think I would never understand. It sort of feels too complex and extremely broad for me. I'm having a look ahead to your subsequent post, I will attempt to get the hang of it!

my homepage; [selimut dewasa](#)

Comment by [selimut dewasa](#) — [March 10, 2014](#)

17. Team Target-Ganassi's success at Kansas Speedway on Saturday marked the 14th consecutive win on an oval track for a team from either Ganassi or Team Penske, a string that dates back to the Rireside Indy 200, July 12, 2008, at Nashville Superspeedway, a race also won by Dixon.

The Audi connect online system turns the car into a Wi - Fi hotspot, allowing connection of mobile devices. A full complement of IRL circuit open-wheel drivers and teams is expected to be on the starting grid for Saturday's 1 p.

Comment by [TURBO RACING LEAGUE HACK](#) — [March 13, 2014](#)

18. Magnificent web site. A lot of helpful info here. I am sending it to a few friends and additionally sharing in delicious. And naturally, thank you in your effort!

Comment by [mobile games](#) — [April 14, 2014](#)

19. Hi would you mind letting me know which hosting company you're utilizing?

I've loaded your blog in 3 different browsers and I must say this blog loads a lot faster than most. Can you recommend a good web hosting provider at a reasonable price? Thank you, I appreciate it!

Comment by [credit monitoring](#) — [April 15, 2014](#)

20. When someone writes an piece of writing he/she maintains the plan of a user in his/her mind that how a user can understand it. Therefore that's why this paragraph is amazing. Thanks!

Comment by [male enhancement oils](#) — [May 9, 2014](#)

21. You can do this by ensuring they eat sufficient fruit and vegetables.

If you choose diet shakes, be careful to choose those containing more fiber with less sugar.

You need to have a number of superfoods in your diet daily.

Comment by [athletic greens ingredients](#) — [May 9, 2014](#)

22. Hey very nice blog!

Comment by [Cheap Nike Air Max 95](#) — [June 24, 2014](#)

23. Finally, they weren't sometimes returning in my signed appliances, that they were only reducing my favorite fit with with the venue with the lodge.

michael kors outlet store <http://www.villagepreschoolcenter.com/wp/pdfs/>

Comment by [michael kors outlet store](#) — [June 24, 2014](#)

24. When I initially commented I clicked the "Notify me when new comments are added" checkbox and now each time a comment is added I get four emails with the same comment. Is there any way you can remove me from that service? Thanks a lot!

Comment by [weight training equipment tower](#) — [July 23, 2014](#)

25. Feel free to surf to my web blog ... web site ([Julian](#))

Comment by [Julian](#) — [August 20, 2014](#)

26. Write more, thats all I have to say. Literally, it seems as though you relied on the video to make your point. You obviously know what youre talking about, why waste your intelligence on just posting videos to your site when you could be giving us something enlightening to read?

homesmtl.net <http://www.homesmtl.net/>

Comment by [homesmtl.net](#) — [August 29, 2014](#)

27. Please let me know if you're looking for a article author for your blog. You have some really good articles and I feel I would be a good asset. If you ever want to take some of the load off, I'd absolutely love to write some articles for your blog in exchange for a link back to mine. Please shoot me an e-mail if interested. Kudos!

Assuming [aroma rice cooker reviews](#) details has you confounded. Click the website link and discover a bit of clarity.

Comment by [aroma rice cooker reviews](#) — [September 23, 2014](#)

28. Hi it's me, I am also visiting this site on a regular basis, this web site is truly pleasant and the people are really sharing fastidious thoughts.

Comment by [google adwords express](#) — [September 23, 2014](#)

29. Hi there to all, because I am truly eager of reading this weblog's post to be updated on a regular basis. It carries fastidious data.

Comment by [roller shades](#) — [September 24, 2014](#)

30. I have been reading your articles Count The Basket » Calculating Adjusted Plus/Minus and they are too much useful for me to learn something new and special. And You can also visit our web also top hyip monitors.

Comment by [top hyip monitors](#) — [October 22, 2014](#)

31. The administration of the laws in Northern Mexico constitutes one of the most painful features of her institutions. Justice, or rather judgments, are a common article of traffic; and the hapless litigant who has not the means to soften the claws of the alcalde with a 'silver unction,' is almost sure to get severely

scratched in the contest, no matter what may be the justice of his cause, or the uprightness of his character. It is easy to perceive, then, that the poor and the humble stand no chance in a judicial contest with the wealthy and consequential, whose influence, even apart from their facilities for corrupting the court and suborning witnesses, is sufficient to neutralize any amount of plebeian testimony that might be brought against them.

Comment by [timberland boots mens size](#) — [November 18, 2014](#)

32. I like what you guys are up too. This kind of clever work and exposure! Keep up the excellent works guys I've you guys to my personal blogroll.
north face cream parka <http://agenteshispanos.com/?shop=north-face-cream-parka&id=8509>

Comment by [north face cream parka](#) — [November 18, 2014](#)

33. This revolutionary smartphone now offers you the complete package of different technologies because it provides for entertainment, web-browsing, e-mailing and an advanced camera. Merely kick As much produce raise ones own cellular, so next pushup once again to observe this keypad.
5 mln installations, with the active daily audience of slightly less than 1 mln users.

Comment by [Delia](#) — [December 12, 2014](#)

34. ちょうどあなたの記事より少し多くを|追加などについて|あなたは今まで思想とみなさがありますか?とすべて、私はあなたがの基本となる重要な貴重なが言うことを意味する。または写真のビジュアルあなたはいくつかの素晴らしいを追加した場合しかし|より多くのあなたの記事を与えるために、ビデオクリップ動画“ポップ、想像する“!あなたのコンテンツが優れているがと写真と動画、このでしたウェブサイトのブログのいずれかである最大フィールド|そのニッチ最高。ブログ!

iphone バッテリー交換 費用 <http://blinds-curtain.com/css/se25pop.asp?id=iphone-fgt/me-iphone-8326>

Comment by [iphone バッテリー交換 費用](#) — [December 14, 2014](#)

35. whoah this blog is excellent i love reading your articles.
Keep up the great work! You realize, a lot of persons are looking round for this information, you can help them greatly.

Comment by [Yahoo](#) — [January 12, 2015](#)

36. Having read this I believed it was extremely enlightening.

I appreciate you spending some time and energy tto put this short article together.
I once again find myself spending a significant amount of time both reading and commenting.
But so what, it was still worth it!

Comment by [advertising in china](#) — [January 13, 2015](#)

37. Wonderful site. Lots of helpful information here. I'm sending it to several pals ans also sharing in delicious. And naturally, thank you for your sweat!

Comment by [lead supply figures](#) — [March 1, 2015](#)

38. When Twiztid starts feeling the financial pinch, he may cut his publicist. This means if you're given a hyperlink to download a motion picture, anybody giving you the hyperlink technically just broke the law.

From their list, discover the registry entry that is linked on the Trojan virus files.

Comment by [The Pirate Bay](#) — [March 10, 2015](#)

39. I do not even know how I ended up here, but I thought this post was good. I don't know who you are but certainly you are going to a famous blogger if you aren't already ;) Cheers!

Comment by [Van](#) — [March 14, 2015](#)

40. Tremendous things here. I am very happy to see your article.

Thanks a lot and I'm looking ahead to contact you. Will you please drop me a mail?

Comment by [m88](#) — [April 29, 2015](#)

41. Basic Building - More citizens means more taxes - When all is said and done, your goal in Sim - City Build - It is to attract new citizens and keep them happy so they don't move out.

If you are patient, you can even score a system at a great price. Other features of this app include the ability to look up information on the cache while you are on the trail and save cache information, including photos and maps. prayer the fishing line requirements on, commonly do not your front together with court case, the passenger truck just isn't going to improve.

Comment by [Cecilia](#) — [May 30, 2015](#)

42. It's awful site. Don't waste my time.

Comment by [chris bosh highlights](#) — [June 20, 2015](#)

43. How Get Pleasure From Your Running, Cheap Jordan Shoes. Well, Cheap Jordans, you should be glad shared there. this article for Cheap Jordan Shoes. Discover Discover The Primary Advantages Of The Best Running Shoes 4 There prevalent you guys to be out there, We.

Comment by [hot kicks](#) — [June 25, 2015](#)

44. At times don't you feel that you could have sent that SMS as an email or vice versa. Now, let's assume that you want to move an app from the first page to the last one. Unfortunately, the latest version of i - Funstastic only works with Mac (both PPC and Intel-based) running OS X 10.

Product development is a process by which a business entity creates an entirely new product that either occupies a new niche or adds to an existing product.

Comment by [cheats for facebook](#) — [August 11, 2015](#)

45. In order to obtain pre-sale tickets, you have to be a member of their LIFAD. One great reputable gaming website is they have games for all

types of people and it's a safe fun environment to play those games in. The online point-and-click scary games online are truly creepy, because you never know what will happen when you reach the end phase.

Comment by [Tyree](#) — [September 15, 2015](#)

46. Have you ever considered writing an e-book or guest authoring on other sites?

I have a blog centered on the same ideas you discuss and would really like to have you share some stories/information. I know my audience would enjoy your work. If you're even remotely interested, feel free to shoot me an e mail.

Comment by [John's motorhome site](#) — [September 19, 2015](#)

47. You're so awesome! I do not think I've truly read a single thing like this before.

So wonderful to find somebody with original thoughts on this issue.

Seriously.. many thanks for starting this up. This web site is one thing that is needed on the web, someone with a little originality!

Comment by [m88](#) — [January 12, 2016](#)

48. I got your post very appealing and soon will upload my thoughts as well.

Comment by [Margo Hardina](#) — [January 15, 2016](#)

49. Blog commenting doesn't lend itself to this type of strategy.

To improve your visibility within the search results and steer clear of squandering your time, you have to have awareness in selecting the right social bookmark management site. 2) Meta tags: you will notice at the top of your browser this page's name is going to be shown this originates from the title meta tag.

Comment by [good backlinks](#) — [January 26, 2016](#)

50. This will be done by a comparative study of both, listing the drawbacks and advantages of both. Typically the device is much cheaper to run than a traditional cigarette, with the equivalent of 20 cigarettes costing on \$0. Adornments are often used for decorative touches on the furniture.

Comment by [LTM08C351](#) — [February 18, 2016](#)

51. If you want to increase your know-how simply keep visiting this website and be updated with the most up-to-date news posted here.

Also visit my boog post ... homepage ([Leonida](#))

Comment by [Leonida](#) — [March 4, 2016](#)

52. It's very easy to differentiate and recognize them through their external appearances and through datasheets.

Basically, our socialization skills would improve and we would become more conscious of our civic duties.

Resistor: Since most semiconductor devices are sensitive to high currents, resistors are employed to restrict a correct flow of current through them.

Comment by [LS075AT011](#) — [March 5, 2016](#)

53. Daphne reached out to Grace a few weeks ago, when she knew she was in a vulnerable place, having recently been let go by Michael yet again (this was a regular pattern). Your trip is carefully planned and meticulously designed to meet your desires. Reputable credit advisors are certified and trained in the areas of consumer credit, money and debt management, and budgeting and can help you develop a personalized plan for debt consolidation.

Comment by [find here](#) — [May 14, 2016](#)

54. Yes, college life is great for some things: You can send out for pizza, go get a Sausage Mc - Muffin for breakfast (if you're on time), go make a snow cone when it's (still) 110 degrees outside and it's September. Experiment with the size and fullness of the bottles until you find a weight that's right for you. With the Hamilton Beach ice shaver machine is has two settings.

Comment by [Winona](#) — [May 17, 2016](#)

55. You're so cool! I don't suppose I've learned something like this before. So good to search out someone with some original ideas on this subject. Really thank you for starting this up. This website is one thing that is wanted on the internet, someone with slightly originality. Helpful job for bringing one thing new to the web!

Comment by [Marco Kavanaugh](#) — [May 17, 2016](#)

56. Hi to every body, it's my first pay a quick visit of this website; this web site contains remarkable and actually good stuff designed for visitors.

Comment by <http://carsforsale.press/the-leading-mba-applications-in-the-usa-businessschooladmissionessays-com/> — [May 17, 2016](#)

57. Great post.

Comment by [Salvatore](#) — [May 19, 2016](#)

58. I'm excited to uncover this great site. I need to thank you for your time for this wonderful read!! I definitely appreciated every little bit of it and I have you saved to fav to look at new stuff in your site.

Comment by [Krystal](#) — [May 19, 2016](#)

59. When I was in middle school, I had an amazing English teacher. They may take couple of days to confirm your residential address. By determining your objectives for the release ahead of time, you can concentrate your efforts (and your funds) to meet the right marketing needs, whether it's SEO, brand exposure or targeting a specific region.

Comment by [go to my blog](#) — [May 20, 2016](#)

60. Parents or any adults reading this, consider the following situation. It should also be close enough to you just in case you're needed to answer a question or two from them. You can also contact an online tutor if you are not able to understand the concepts.

Comment by [find here](#) — [May 23, 2016](#)

61. Thoughtful analysis ! I Appreciate the information ! Does someone know if my business might be able to locate a fillable CA FL-341(C) version to type on ?

Comment by kym berlin — [May 27, 2016](#)

62. Excellent weblog right here! Additionally your web site loads up very fast!
What host are you the usage of? Can I am getting your affiliate link in your host?
I want my website loaded up as quickly as yours lol

Comment by [ครีมหน้าขาว pantip](#) — [June 3, 2016](#)

63. Keep oon writing, great job!

Jangan sungkan untuk mengunjungi halaman website Kami buiat
mendapat Fakta ledbih lengkap mengenai [jasa anti rayap](#) .
Thanks ya

Comment by [jasa anti rayap](#) — [June 4, 2016](#)

64. I've been browsing online more han 3 hours today,
yett I neve found any interesting article like yours.
I t's pretty worth enough ffor me. In myy opinion,
if all web owners aand bloggers made good content as you
did, the net will be much more useftul thaqn ever before.

Silahkan Kunjungi webb Saya buat mendapatkkan Informasi
lebjh komplit mengenai [daftar resep masakan ayam mudah indonesia](#) .
Terima Kasih

Comment by [daftar resep masakan ayam mudah indonesia](#) — [June 4, 2016](#)

65. bookmarked!!, I really like your site!

Jangan sungkan untuk mengunjungi web Akku demi mendapat Fakta lebih lengkap mengenai [jual jas murah](#) .
Thanks ya

Comment by [jual jas murah](#) — [June 4, 2016](#)

66. Great post! We are linking tto thhis particularly great content On our site.
Keep uup the grewt writing.

Jangan sungkan untuk mengunjungi halaman webb Ane untuk
dapatkan Dataa lebvih lengkap mengenai [jasa basmi rayap jakarta](#) .
Terima Kasih

Comment by [jasa basmi rayap jakarta](#) — [June 4, 2016](#)

67. I do trust all of the concepts you have presented in your
post. They're really convincing and will definitely work.
Still, the posts are very quick for novices. May just you please extend them a little from
subsequent time? Thanks for the post.

Comment by [Lenora](#) — [June 5, 2016](#)

68. The world wide web has achieved exceptional measures in the last couple of of years.

At the end of October, I stood in front of a roomful of wonderful women to facilitate a one-day event on Body - Sense principles. s love for high heel shoes continues to enrapture both the heart and feet of the women.

Comment by [kd sneakers](#) — [June 11, 2016](#)

69. This web site is known as a stroll-by for all of the information you needed about this and didn't know who to ask. Glimpse right here, and also you'll definitely uncover it.

Comment by [Preston Fanoele](#) — [June 12, 2016](#)

70. Make sure you let everyone you actually know on Facebook that your business needs more likes, and that you would appreciate it if they visited your business page. Once you've done that you can choose which pages you want to promote using Twiends. With new changing graphics and pictures, more traffic would be pulled.

Comment by [advice](#) — [June 13, 2016](#)

71. Therefore, the matchmaking will continue to work around the Card quantities to the people which they cant change in conflict fights only's existing deck.

Comment by [clash royale tips](#) — [June 22, 2016](#)

72. [web designer perth](#)

Production has dwalt with a vast areay of clients in different sectors,including vehicle, solution, health anddd wellness, ecommerce and health and fitness, sports, as well as more.

Comment by [web designer perth](#) — [June 23, 2016](#)

73. It's going to be ending of mine day, but before finish I am reading this wonderful post to improve my knowledge.

Comment by [Martha](#) — [June 23, 2016](#)

74. El técnico encontrará en esta obra principios tecnológicos de física, mecánica, electricidad y otros varios que le ayudarán a calcular y resolver problemas técnicos, así como normas y consignas de seguridad, esquemas básicos de electricidad, neumática, hidráulica, fluidos en general, calefacción, refrigeración y ventilación. Es una obra que en su versión original ha alcanzado 42 ediciones, debido a su éxito y a lo imprescindible para cualquier profesional y técnico de los sectores de frío y calor. Este libro ayudará a descubrir y conocer los secretos prácticos de la refrigeración en general.

Comment by [consumo de todos los electrodomesticos](#) — [June 24, 2016](#)

75. I know this site provides quality depending articles or reviews and additional data, is there any other website which provides these information in quality?

Comment by [Julio](#) — [June 25, 2016](#)

76. " Black became redefined like a popular, a good affirmation of self. Surely, you will not wish to communicate these poor qualities towards the selections committee. Unlike students loans, these won't you burden you in the worries of coughing up back the money when you complete your education.

Comment by [UoN](#) — [July 5, 2016](#)

77. Then, schedule your advertisement if you need it to own continuously starting today or run the ad on its specified dates you want.

In November 2013, Marketing Land reported around the 25 million small company Facebook Pages. You can also learn more to do with advertising your multi level marketing, have the full truth on Networking by clicking.

Comment by [how do promoted facebook ads appear on facebook](#) — [July 12, 2016](#)

78. Appreciate it for this tremendous post, I am glad I found this website on yahoo.

Comment by [Jamal](#) — [July 20, 2016](#)

79. Investigaciones sobre la recepción de Séneca en España desde el siglo XIII hasta el siglo XVII, Madrid, Gredos. Bonet Correa, Antonio (1980), Bibliografía de arquitectura, ingeniería y urbanismo en España (1498-1880), Madrid-Vaduz, Turner-Topos Verlag, 2 vols. Bonnant, Georges (1962), «Notes sur quelques ouvrages en langue espagnole imprimés à Genève par Jean Crespin (1557-1560)», en Bibliothèque d'Humanisme et Renaissance, XXIV, pp. 50-57. Medina, José Toribio (1952), Ensayo bio-bibliográfico sobre Hernán Cortés, ed. e introd.

Comment by [Murray Skilton](#) — [July 22, 2016](#)

80. Hacemos limpieza de arquetas, contamos con servicio de cámara, tuberías de agua, fugas de agua, instalaciones, fontanería en general Precio anticrisis, personal altamente calificado, trabajo garantizado. Servicios urgentes disponibles las 24 horas del día para desatascar tuberías, vaciar fosas sépticas, solucionar problemas de malos olores humedades, evacuar aguas de inundaciones, y reparar todo tipo de red de saneamientos. La empresa se desplaza a cualquier sitio para realizar su trabajo y lo mejor de todo es que puedes contar con ellos en cualquier momento, ya que están operativos las 24 horas del día y los 365 días al año. Las emergencias son nuestra especialidad pues siempre trabajamos con urgencia.

Comment by [Rolf Mangini](#) — [July 26, 2016](#)

81. Aún con mi garantía en vigencia, lo envié al servicio técnico, y debido al desgaste de sus maravillosos plásticos, y a la rotura sobre la articulación de la pantalla, se escudan en que el equipo en algún momento tuvo mal uso (supongo que se refieren a que no hacen equipos diseñados para funcionar 8 horas al día... ;). Y se desentienden de él, a menos que acepte pagar por el arreglo.

Comment by [eficiencia energetica electrodomesticos clase a](#) — [August 5, 2016](#)

82. My brother suggested I might like this website.
He was entirely right. This post truly made my day.
You can not imagine just how much time I
had spent for this information! Thanks!

Here is my webpage ... bandar bola ([rushown.com](#))

Comment by [rushown.com](#) — [August 5, 2016](#)

83. Hello Web Admin, I noticed that your On-Page SEO is missing a few factors, for one you do not use all three H tags in your post, also I notice that you are not using bold or italics properly in your SEO optimization. On-Page SEO means more now than ever since the new Google update: Panda. No longer are backlinks and simply pinging or sending out a RSS feed the key to getting Google PageRank or Alexa Rankings, You now NEED On-Page SEO. So what is good On-Page SEO? First your keyword must

appear in the title. Then it must appear in the URL. You have to optimize your keyword and make sure that it has a nice keyword density of 3-5% in your article with relevant LSI (Latent Semantic Indexing). Then you should spread all H1, H2, H3 tags in your article. Your Keyword should appear in your first paragraph and in the last sentence of the page. You should have relevant usage of Bold and italics of your keyword. There should be one internal link to a page on your blog and you should have one image with an alt tag that has your keyword....wait there's even more Now what if i told you there was a simple Wordpress plugin that does all the On-Page SEO, and automatically for you? That's right AUTOMATICALLY, just watch this 4minute video for more information at. [Seo Plugin](#)

Comment by [seo plugin](#) — [August 20, 2016](#)

84. Would love to forever get updated outstanding site!

Comment by [The Heel Lift](#) — [August 20, 2016](#)

85. Hello Web Admin, I noticed that your On-Page SEO is missing a few factors, for one you do not use all three H tags in your post, also I notice that you are not using bold or italics properly in your SEO optimization. On-Page SEO means more now than ever since the new Google update: Panda. No longer are backlinks and simply pinging or sending out a RSS feed the key to getting Google PageRank or Alexa Rankings, You now NEED On-Page SEO. So what is good On-Page SEO? First your keyword must appear in the title. Then it must appear in the URL. You have to optimize your keyword and make sure that it has a nice keyword density of 3-5% in your article with relevant LSI (Latent Semantic Indexing). Then you should spread all H1, H2, H3 tags in your article. Your Keyword should appear in your first paragraph and in the last sentence of the page. You should have relevant usage of Bold and italics of your keyword. There should be one internal link to a page on your blog and you should have one image with an alt tag that has your keyword....wait there's even more Now what if i told you there was a simple Wordpress plugin that does all the On-Page SEO, and automatically for you? That's right AUTOMATICALLY, just watch this 4minute video for more information at. [Seo Plugin](#)

Comment by [seo](#) — [August 20, 2016](#)

86. Another example is if a married couple deals with bed-wetting.
I think it's too early and leaves the hitte in a little bit of a "pause" mode and hinders momentum into the pitch. The size of the blunt edge of the depth of penetration can directly affect the roots, blunt edge, the ore difficult penetration.

Also visit my web blog [spiral weld pipe manufacturers](#)

Comment by [spiral weld pipe manufacturers](#) — [August 20, 2016](#)

87. 新品の財布の

- 株式情報はいつでも更新します！
 - ◆ 品質が良く、は価格が、実物の写真が低いです！
 - ◆ 経営方針：品質を重視して、納期も厳守して、第1を使いを信じます！
 - ◆ 超とりわけ安い価格で、安心して、迅速で、確かで、顧客の身边まで(に)引き渡します。豊富な商品でそろって最も新作もいつでも商品が到着してゆっくりと見てくださいます。
- 広大な客がご光臨賜いを歓迎します
- ロレックス レディース 売れ筋 suv <http://www.eevance.com/tokei/alangesohne/baf6ab2ae929ad8c.html>

Comment by [ロレックス レディース 売れ筋 suv](#) — [August 20, 2016](#)

88. Some genuinely superb info, Gladiola I discovered this.

Also visit my blog: [Rocky Hill Powerwashing](#)

Comment by [Rocky Hill Powerwashing](#) — [August 20, 2016](#)

89. Marvelous, what a webpage it is! This weblog gives helpful facts to us, kep it up.

Also visit my web blog: [Talent](#)

Comment by [Management Development](#) — [August 20, 2016](#)

90. You're so awesome! I don't suppose I've read anything like that before. So good to discover another person with original thoughts on this issue. Seriously.. many thanks for starting this up. This website is one thing that is needed on the internet, someone with a bit of originality!

Feel free to visit my web blog [Jerome Roy](#)

Comment by [Darnell Crawford](#) — [August 21, 2016](#)

91. It is best to take part in a contest for top-of-the-line blogs on the web. I'll suggest this web site!

Comment by [bastcilkdoptb](#) — [August 21, 2016](#)

92. I am regular reader, how are you everybody? This post posted at this web page is really fastidious.

Comment by [Daftar M88](#) — [August 21, 2016](#)

93. Than you a lot for giving everyone an extraordinarily marvellous possibility to read in detail from this web site. It is often so beneficial and as well , stuffed with fun for me personally and my office co-workers to search the blog the equivalent of 3 times a week to see the latest things you have. Not to mention, I am at all times satisfied with all the powerful principles you serve.

Certainly areas in this posting are easily the most beneficial I have ever had.

Comment by [height growth pills](#) — [August 21, 2016](#)

94. Зарабатывай с нами уже завтра! Гарантированные выплаты каждый день! Стабильный заработок 2.5-3% в день!

Регистрируемся <https://rns-group.org/ref/vovka002>

Comment by [FctorDele](#) — [August 21, 2016](#)

95. порно с блондинкой видео секс бдсм ([Marcelino](#))

Comment by [Marcelino](#) — [August 22, 2016](#)

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