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ISYS 520 VBA
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Final Project Write-up

Page 1 – Project Summary

I love basketball so for my final VBA project, I decided to create a mock draft for the upcoming NBA lottery. On May 20th, 2014 the real NBA Lottery will occur for each team that failed to make the playoffs. Each team is assigned a given a number of balls according to how many wins and losses that they had the previous season. The team with the worst record is assigned the most balls; the team with the second worst record is assigned the second most balls, and so on. There are a total of 1000 balls. The breakdown for each team is shown below.

Team Rank (out of 30)	Number of Balls	Chance of winning lottery
30	250	25.0%
29	199	19.9%
28	156	15.6%
27	119	11.9%
26	88	8.8%
25	63	6.3%
24	43	4.3%
23	28	2.8%
22	17	1.7%
21	11	1.1%
20	8	.8%
19	7	.7%
18	6	.6%
17	5	.5%

The purpose of the lottery is to determine the real draft order that occurs when the season is over at the end of June. "Winning" the lottery means that you will be the first to draft the player of your choice that is coming out of college. The lottery is completely random and is designed to give the teams with the worst records a better shot at getting a higher draft pick which will allow them to choose the player that they feel will fit best with their team. The hope is that whichever player they select will then help them win more games the upcoming year.

The purpose of my project was to recreate this lottery based off of accurate up-to-the-minute data to see what the chances each team had of winning the lottery, so that I wouldn't have to wait until the end of the season to start guessing where the best college players are most likely to end up next year.

Page 2 & 3 – Implementation

Tabs created and their purpose:
- Main
  - This is the only tab visible to the user. It has the button to run the mock lottery as well as a picture and designated cells to display the results. There are 14 teams in the lottery, so this will show the draft order, the team, and the player that each team is most likely to select given their position. I also removed gridlines from this tab to clean the page up.
- Data Query
  - This tab was used to pull in live statistics from each team and determine the 14 teams with the worst records. After the web query is updated, the data is transferred to the "Data Sort Filter" tab to be organized. I used the following website to pull in the up-to-date standings
    http://www.hoopsstats.com/basketball/fantasy/nba/standings/14/2
- Data Sort Filter
  - Once the data query is refreshed and the data is copied to this tab, the first thing that I did was delete the blanks. The data query had one blank row in between each team's stats so I needed to eliminate the blanks to better sort and filter the data. Once the blanks were gone I sorted the win's column from least to greatest since this would give me the 14 worst teams on top. This was necessary so that I would know how many lottery balls to assign each team, which I did on the "Lottery Percentages" tab.
- Players
  - Like the tab mentioned above, this tab is similar but this one pulls in a data query of the top 75 NBA prospects. I used the site listed below because it is often updated and is subject to change depending on player performance. Since March Madness is on, there is even more movement than usual in the rankings so I thought that it would be appropriate to use an up-to-date list.
    http://www.nbadraftinsider.com/2014-nba-draft-prospects
- Lottery Percentages
  - This tab gave me a visual of the bottom 14 teams that I got from the "Data Sort Filter" tab. It shows the percentage that each team has of winning the lottery as well as how many lottery balls that each team will be assigned. This tab is very similar to the table that I created on page 1, except it also contained the number of wins and losses that each team had.
- 1000 Lottery Balls
  - This is the tab where the bulk of my VBA project happened. After the worst records and number of lottery balls had been determined for each team, it

was time to assign the lottery balls. Each cell from 1-1000 in Column A represented a unique lottery ball. I assigned the worst team cells A1-A250 by copying the name of that team into each of the 250 cells since they are given 250 out of the total 1000 lottery balls. I used a loop to do this and grabbed the information from the "Lottery Percentages" tab. I had the second worst team be copied into cells 251 to 449 since they get 199 balls, and so forth. I used a loop for each of these ranges so that the 1000 balls could be assigned instantaneously. Once the 1000 balls were assigned, I then needed to randomize column A1 to A1000. I needed not only to randomize the 1000 team names but I also needed to select a cell at random after that had been done. This was necessary so that I could simulate a randomly selected ball from the 1000 choices. The first randomly selected cell in the randomized column would represent the first overall selection in the draft. I also had to make sure that once a team was selected, that there were no duplicates since it is impossible to be selected for more than one of the fourteen spots. I used an array to loop through and check for duplicates as it randomly selected the fourteen teams. Once it had gone through and selected all fourteen draft spots at random I had the results posted on the "Main" tab. I then connected the top 14 NBA prospects to the 14 teams in the order that they were selected in the lottery assuming that each team would take the best player available for their pick.

- Notes
    - This tab helped me keep track of my "To Do" list, next steps, questions, and ideas that I had through the course of working on my project. This tab was not a part of the solution, but helped me stay organized.

Page 3 & 4 – Problems and Learning

I started out with zero experience in VBA at the beginning of the semester. The projects and homework assignments have been hard for me but I learned with this project is that VBA is much more fun when you are working on something that you enjoy. I have learned a lot in this class, but I really enjoyed applying the things that I have learned towards solving a problem that I cared about.

The first problem that I encountered with this project was finding good websites that would allow me to only grab certain tables of information because I didn't want to pull in the entire site. I needed consistency in my data so that I could manipulate it and have it work every time. The web queries were easy to create, but I had to learn how to update them.

The next thing I learned was how to sort data in VBA. I got stuck here but I used a macro on another workbook to simulate what I was trying to do, and this helped me work

through and figure out how to sort the wins column from least to greatest. I found this technique very helpful when I got stuck. I noticed that macros aren't the most efficient way to do things and it often times needs to be cleaned up so that it is understandable.

The next thing I learned was that with a big project it really helped me to break it up into small pieces and work on one step at a time. I wrote out on paper what I wanted to do and then had to figure out how to apply concepts from this class to solve my problem.

The major challenge that I had with this assignment was figuring out how to assign and then randomize the 1000 lottery balls. Assigning them was fairly straight forward, but figuring how best to randomize the picks was a huge challenge. I recognized that my solution needed to be similar to the "Traveling Salesman" that we had seen in class in the fact that once a city, or in my case a team, had been selected that it could not be chosen again. It was not exactly the same exact problem, but I used an array to solve this and checked it against previous selections.

I also learned how to do things like making sheets very hidden so I have control on what worksheets the user can see, taking away gridlines, and other things to clean up my project. I believe that these things make my project look more professional because it is so clean. My project is complete, it works, and I am very happy with it.

Page 4 - Assistance

There were many times that I got stuck in my project, but that is good because that's usually when you learn the most. Sometimes I couldn't figure something out and would sleep on it. A couple of times I ended up waking up with a new idea that would help me make the next step. Other times when stuck, I referred to the book and google.com for help. There are a lot of good forums out there that provide help. I even used youtube.com and watched others attack similar problems that helped me. After I had exhausted all of my resources on my own and was still stuck, I would use the TA for help. I noticed that with Nathan it was very helpful just to talk out my problem and he helped me wrap my head around some more difficult concepts and ideas that we haven't learned in class. I was resourceful but I did not use a significant amount of help on this project. I worked very hard and made sure to experiment and fight through each step before I asked for help. In doing so, I grew a lot and loved doing my final project.