

## Ch 6 Solving Problems with Matrices, Graphs, and Diagrams

### Sec. 6-1 Using Diagrams to Represent and Analyze Processes.

1. Read the following article on “the teams preparation for the week before the big game” (located at end of questions) and create a flow chart that shows, that an action has taken place (ie. Rectangle) and a decision (ie. Diamond). Try to create a loop in the flow chart.

### Sec. 6-2 Using Diagrams to Represent and Analyze Relationships

2. **Cause-and-Effect Diagram:** Brainstorm topics on why your team lost games or won games for the regular season. Make sure it is a diagram as on page 338
3. Take a look at your team’s current Regular game schedule.(Ignore pre-season)  
Create a **Network diagram** that represents how the teams are interconnected. An arrow from your team to another team means that your team will be playing at that teams stadium.(Away game) An arrow to your team means that your team is playing that team at home. (Home game.)
4. Locate a list of your team’s staff. Observe the many jobs that are required to make sure your team is functioning properly. Create an **Organization Chart** and categorize the many people and departments involved. Make sure there is some sort of hierarchy. Go to your team’s web page and look up the team roster or team staff page  
Ex. <http://www.packers.com/team/staff/>

#### NFL HISTORY

-- Select a Year --

2004

American Conference							
Eastern Division							
	W	L	T	Pct.	Pts.	OP	
New England	14	2	0	.875	437	260	
N.Y. Jets*	10	6	0	.625	333	261	
Buffalo	9	7	0	.562	395	284	
Miami	4	12	0	.250	275	354	
Northern Division							
	W	L	T	Pct.	Pts.	OP	
Pittsburgh#	15	1	0	.938	372	251	
Baltimore	9	7	0	.562	317	268	
Cincinnati	8	8	0	.500	374	372	
Cleveland	4	12	0	.250	276	390	
Southern Division							
	W	L	T	Pct.	Pts.	OP	

5. Go to the NFL history of the standings of teams from year to year

Create a matrix that contains the information for any two divisions (Make sure that your team is represented.)

Do not worry about T (Ties) and Pct. (Percentage)

The matrix should be a 8 by 4 matrix.

- a) Create three matrices for the years 2004, 2003 and 2002  
Call them matrix A , B and C respectively.  
Use the matrices for the following calculation

$$AVG = \frac{[A] + [B] + [C]}{3}$$

- b) Use the matrices created in question (a) and calculate a “**Point Rating Matrix**” according to the following rules.

- i) Create a 4 by 1 matrix called D that associates 5 points for a Win, -2 points for a Loss, 1/16 points for Pts. and -1/16 for Opponent points (OPP).
- ii) Find the product of [A][D], [B][D] and [C][D].
- iii) Add these matrices together. Call this matrix E.
- iv) Divide E, which is an (8 by 1) matrix by 3 to get an average. This represents the team’s rating for the last 3 years.

## Sec. 6.4 Matrix Multiplication - Transition Matrices

6. By using your Team's current Regular Season Schedule, fill in the following table:

The following example uses The Baltimore Ravens as the Project Team.

It Records the Away Games as a 1 and Home games as a 0 . The First Row is done for you.

		To that city in which game is being played												
		BALT	IND	TEN	JETS	DET	CLEV	CHIC	PITTS	CIN	JACK	HOUS	DEN	GB
From the City (Visiting Team)	BALT	0	0	1	0	1	1	1	1	1	1	0	1	0
	IND	1	0											
	TEN			0										
	JETS				0									
	DET					0								
	CLEV						0							
	CHIC							0						
	PITTS								0					
	CIN									0				
	JACK										0			
	HOUS											0		
	DEN												0	
	GB													0

### Ex. Team Schedule - Baltimore Ravens 2005 Regular Season Schedule

Date	Opponent
Sep 11	Indianapolis
Sep 18	@Tennessee
Oct 2	N.Y. Jets
Oct 9	@Detroit
Oct 16	<b>Cleveland</b>
Oct 23	@Chicago
Oct 31	<b>@Pittsburgh</b>
Nov 6	<b>Cincinnati</b>
Nov 13	@Jacksonville
Nov 20	<b>Pittsburgh</b>
Nov 27	<b>@Cincinnati</b>
Dec 4	Houston
Dec 11	@Denver
Dec 19	Green Bay
Dec 25	Minnesota
Jan 1	<b>@Cleveland</b>

Now for the next row, Look up Tennessee's 2005 Regular season. Record a 1 in the row if Tennessee Plays any away games vs the teams that Baltimore Plays. Ie. Does Indianapolis play an away game at Baltimore? Answer: Yes. So record a "1" in R2C1 Continue until all rows are full.

Call This Matrix A. (13 by 13)

Matrix A is a matrix that shows how many away games a particular team (in Baltimore's game schedule) would play.

- b) Use Matrix A to determine the number of intermediary away games that the teams will have. Call this matrix B. What are the total number of intermediary away games that **your team** plays Show matrix B.
- c) Use Matrix A to determine the number of two intermediary games that the teams will play. Call this matrix C. Show the matrix. What are the total number of two intermediary away games that **your team** plays.

## Sec 6.5 Solving Problems with Graphs

7. The following Task Table must be completed to create a Project Graph that will calculate the Earliest Start Time for the Super Bowl Game at the end of the season.

a) How many letters are there in the full Name of your team? Let  $n$  = “the number of letters in your team name”  
 ie. Baltimore Ravens -  $n = 15$  letters

b) Fill in the following Task table with the appropriate Duration Days.

Task	Description	Duration (Days)	Prerequisite (Task(s))
<b>Start</b>	Select Game Stadium		
<b>A</b>	Re-sod the field	$n - 4$	none
<b>B</b>	Paint the Field	$n - 6$	A
<b>C</b>	Book Hotel Rooms	$n - 2$	B
<b>D</b>	Entertainment	$n - 2$	A
<b>E</b>	T.V. Coverage	$n$	D
<b>F</b>	Pre Party for coaches	$n - 7$	C, E
<b>G</b>	Seating and tickets	$n - 4$	F
<b>H</b>	Hire security	$n - 6$	F
<b>I</b>	Parking Facilities	$n - 2$	G, H
<b>J</b>	Player Facilities	$n$	F
<b>K</b>	Concession Stands	$n + 3$	J
<b>L</b>	Stadium Electronics	$n - 4$	K, N
<b>M</b>	Media Facilities	$n + 4$	K, L
<b>N</b>	Company Sponsorship	$n + 2$	J
<b>O</b>	Stadium Computer Dept	$n - 4$	M
<b>P</b>	Stadium Employees	$n - 5$	I, O
<b>Finish</b>			

c) Create a Project Graph and use critical path analysis to determine the optimal time to complete all tasks in preparation of the Super Bowl.

So it turns out that the coaches and players for professional football games aren't actually partying and lazing about Monday through Saturday. They actually have work to do when they're not suiting up and playing in Sunday's game. They actually watch film, attend meetings, do any number of weight lifting or aerobic workouts, have scrimmages and skill drills, and even partake in what the game dubs as "alternative methodology". Alternative methodology includes such things as meditation, yoga, and even ballet, which I naturally assign every week to all my defensive linemen. You just can't go wrong with three-hundred-pound linemen in tutus.

**Scouting is key.**

One initial reservation is the sheer scope of options. You have five days (Monday through Friday) to organize and each day can contain 40 hours of activity for your players. Beyond the sheer amount of time to fill, there are dozens if not hundreds of options to choose from. It's daunting, but it can be done, and done much easier than you would have initially guessed.

**Know Your Players**

The purpose of weekly preparation is to improve your team, and more specifically to ready them for the next week's game. You can't hope to do either effectively if you don't understand the strengths and weaknesses of your players. Spend some time with your depth chart. Note your best and worst members, and note what they are best and worst at. Let's say you have Peyton Manning as your quarterback. His passing rating, power, and accuracy are off the charts, but he's not the greatest scrambler. Maybe that's an area you'll want him to focus on. Look for things like that. You've got to know your players to improve them. Don't worry about memorizing everything, just get the broad strokes down initially.

**Know Your Opponent**

Understand this: Weekly preparation means just that. You're not preparing your team for the rest of the season. You're getting them ready for their next game, and that's it. Yes, you may want to have some overriding themes for your weekly practices, but much of it should be dedicated to preparing specifically for your next opponent. Before you begin assigning tasks for the week, take a long look at the Scouting option. There are four different categories to look at when scouting your opponent. Here's what they are and what they're good for.

\* **Opponent Match-Up:** This is a broad look at how you stack up against the opposing team. You'll see season stats for points, total yards, rushing yards, and passing yards, as well as how many points and yards your defense has given up. You'll also see a Head-to-Head chart showing which overall aspects of your team are better, worse, or tied (a push) with the other team.

**Opponent Analysis:** This breaks down different match-ups between you and your opponent. You can check out how your DBs match up against their Wide Receivers, how your Offensive Line stacks up against their Defensive Line, and so on and so forth. The detail gets deep here, so make sure you comb through it and understand where the holes in the match-ups are. That's what you'll want to focus on during the week's practice.

\* **Primetime Players:** This shows you the opposing team's four best players. Star players carry and control games, so make sure you're prepared to deal with their best.

\* **Injury Report:** This simply details who is injured on both teams. It's good stuff to know, but don't let an injury on their side lull you into complacency.

In Part One we discussed some of the difficulties of the Weekly Preparation feature in ESPN NFL 2K5, as well as some of the initial research you'll need to do to properly prepare for organizing each week's activities. Here, in Part Two, we'll discuss some more specific strategies and focus on the dos and don'ts of your weekly preparation. There's a lot to cover, so let's just skip the preamble and jump straight into it, shall we?

## A Running Theme

Creating a theme of sorts for each day is not only helpful for weekly consistency's sake, but it keeps you organized as well. Need to know what position drills your QB is up to this week? It will make things faster if you already know your position drills are done on Tuesday.

Team meetings are crucial.

Here's a quick breakdown of the themes I've set for each day.

- \* Monday is my film day. After all, you play Sunday and you don't want to overexert your players the day after they've given their all. The weekly team meeting and coaches' film session happens Monday as well, though that is out of necessity. The team meeting and coaches' film session is only available on Mondays.

- \* Tuesday is workout day, so nearly all weight room and aerobic sessions take place on Tuesday. I figure it's better to work them really hard earlier in the week so they're not tired on game day.

- \* Wednesday, I run most of my position drills (e.g. QB routes and progressions drill, HB gauntlet drill).

- \* Thursday and Friday are mostly scrimmages and 7-on-7 drills (they focus on skill positions) with a smattering of random activities to fill out the team needs. Also, if I'm going to give the team any time off, I do so towards the end of the week.

## Shaking Things Up

Keep in mind that each workout and drill usually only helps one aspect of a player's game. You don't want your HB getting faster and faster each week at the expense of all his other skills. Make sure you keep everyone well rounded. Have them focus on a different skill set each week, and then if you have any leftover time you can overlap workouts and drills from previous weeks.

## It's in the Stars

Like it or not, it's usually up to your star players to win or lose you a game in the clutch. Focusing on your stars during weekly preparation may seem to perpetuate the skill gap between them and the rest of the team, but that's usually necessary. Unless you're playing a remarkably balanced team, always try to make sure your best players are at least as good as they were last week.

## Let's see if the weight room leg work paid off.

### Morale and Focus

During Weekly Preparation the coach must rate how high your team morale and focus is. These are two different but very important items. Chances are you'll never see both of them topped up; after-all, great team moral usually means time off which is the perfect opportunity for your players to lose focus. At the same time, if you work your team too hard they'll become disgruntled. Make sure to watch the intensity of your workouts. Each workout, drill, scrimmage, or alternate methodology has a different intensity (or number of sets) you can assign them. Nothing will dispirit a team more than being overworked.

In the end, the key to Weekly Preparation is the ability to read and respond to a situation. The needs of your team change from week to week. You'll need to watch your injuries, scout your opposing team, recognize what went wrong in the last game you played, remember which players declined, shake up the skill sets your team works on, and so much more. However, as long as you're willing to take stock each week and spend a few minutes mapping out a general game plan, Weekly Preparation will become one of the most engrossing and rewarding elements of