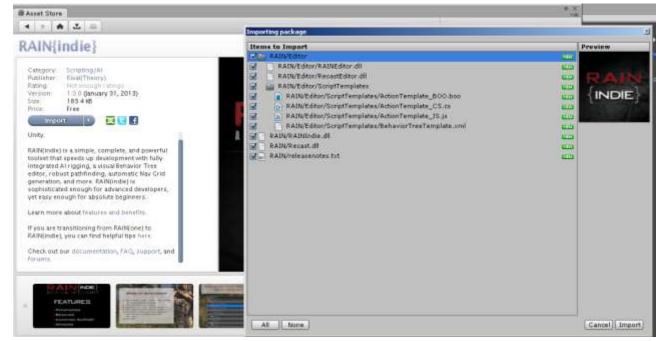
Basic Waypoints Movement v1.0

- 1. Create New Unity project (or use some existing project)
- 2. Import RAIN{indie} AI package from Asset store or download from: http://rivaltheory.com/rainindie



3.

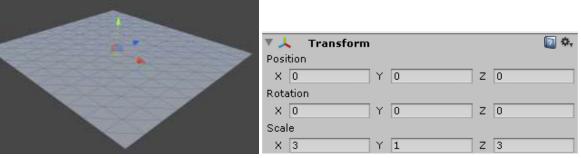
4. Your menubar should now have an extra item "RAIN" (if its not there, click the menu bar once..)

🔇 Unity - Untitled - RainAIBasicWaypoints1 - PC, Mac & Linux Standalone* 🚽									
Eile	<u>E</u> dit	Assets	GameObject	Component	t Terrain	RAIN	<u>W</u> indow	<u>H</u> elp	
•	> (2 4		Center	Global				

5. ps: I'm using "Tall" layout in editor for this tutorial:

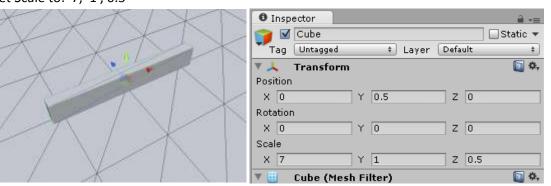
	_ 8 ×
Layers	Tall 🕞
O Inspector Path Manager Tag Untagged Transform	2 by 3 4 Split Default Tall Wide

- 6. Lets build some test scene:
 - Menu: GameObject / Create Other / Plane
 Move it to position: 0, 0, 0
 Set Scale to: 3, 1, 3

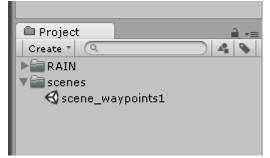


http://unitycoder.com/blog

 Menu: GameObject / Create Other / Cube Move it to Position 0, 0.5, 0
 Set Scale to: 7, 1, 0.5



c. Lets Save the scene here, create "scenes" folder in project view and save the scene.



d. Create our monster
 Menu: GameObject / Create Other / Sphere
 Move it to Position: 0 0 5 -2

iviove i	t to Position: 0 , 0.5 ,	2
	VAI	X

XXXX	0 Inspector	_
MAS	👕 🗹 Sphere 🗌 St	atic 🔻
VX LA	Tag Untagged ‡ Layer Default	\$
XDAR	🔻 🙏 Transform	💽 🌣,
	Position	
	X 0 Y 0.5 Z -2	
	Rotation	
	X 0 Y 0 Z 0	
	Scale	
	X 1 Y 1 Z 1	
		(C)

- e. Lets turn this sphere into AI agent
- f. Select the sphere
- g. Add rigidbody component (can do it from menu also: Component / Physics / Rigidbody)

1.1

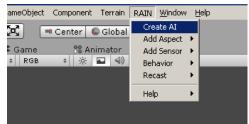
Add Compor	ient
Q rig	8
Search	
\land Rigidbody	
New Script	⊬

h. Then freeze rigidbody rotations: [x]X [x] Y [x] Z

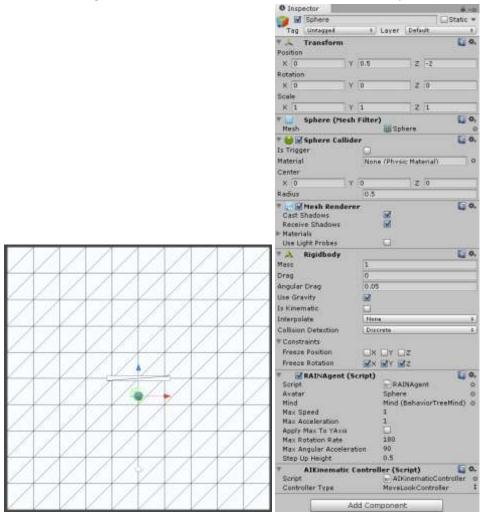
🔻 🙏 🛛 Rigidbody		(
Mass	1	
Drag	0	
Angular Drag	0.05	
Use Gravity		
Is Kinematic		
Interpolate	None	\$
Collision Detection	Discrete	\$
▼ Constraints		
Freeze Position	🗆 X 🗖 Y 🗖 Z	
Freeze Rotation	⊠X ⊠Y ⊠Z	
Add	Component	

i. Then with the sphere still selected:

From menu: RAIN / Create AI (adds AI component to the selected object)



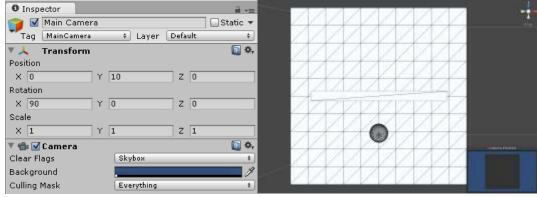
Results: (RainAgent and AIKinemaricControllers are added to the sphere)



j. Lets move our camera on top

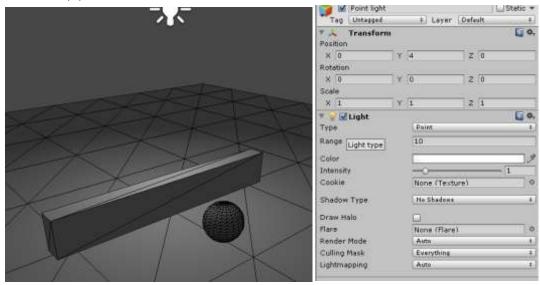
Position: 0, 10, 0

Rotation: 90, 0, 0

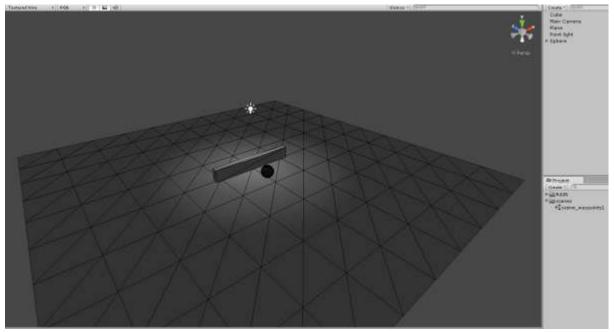


k. And add a some light

Menu: Gameobject / Create Other / Point Light Position: 0,4,0

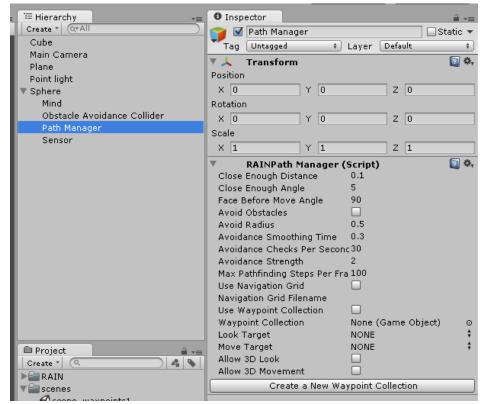


I. Our scene should look like this:



7. Adding waypoints system

- a. Select Sphere from the hierarchy
- b. Under the >Sphere object you have "Path Manager", select it

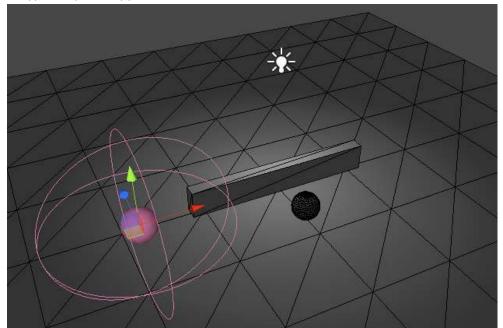


c. Click that "Create New Waypoint Collection" button
 "Waypoints1" object is created in Hierarchy

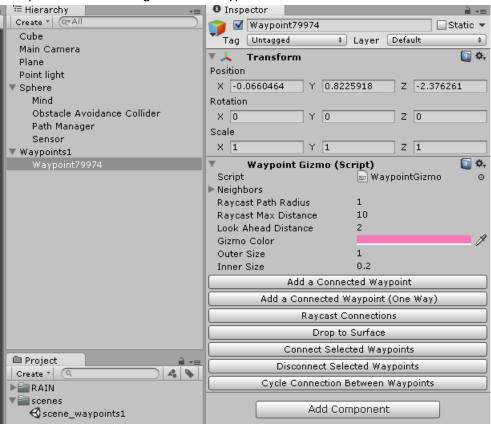
And some new buttons appear:

'≔ Hierarchy -=	0 Inspector	a -≡	
Create * Q*All	👕 🗹 Path Manager	🗌 🗌 Static 🔻	
Cube	Tag Untagged + Laver Default	\$	
Main Camera	Transform	💽 🌣,	
Plane	Position		
Point light			
▼ Sphere	X 0 Y 0 Z 0		
Mind	Rotation		
Obstacle Avoidance Collider	X 0 Y 0 Z 0		
Path Manager	Scale		
Sensor	X 1 Y 1 Z 1		
Waypoints1			
	RAINPath Manager (Script) Close Enough Distance 0.1	- m	
	Close Enough Angle 5		
	Face Before Move Angle 90		
	Avoid Obstacles		
	Avoid Radius 0.5		
	Avoidance Smoothing Time 0.3		
	Avoidance Checks Per Seconc 30		
	Avoidance Strength 2		
	Max Pathfinding Steps Per Fra 100		
	Use Navigation Grid		
	Navigation Grid Filename		
	Use Waypoint Collection 📃		
	Waypoint Collection Waypoints1	0	
	Look Target NONE	ŧ	
🖹 Project 🔒 📲	Move Target NONE	ŧ	
Create *	Allow 3D Look		
▶ ■ RAIN	Allow 3D Movement		
V scenes	Add a Waypoint		
Scene_waypoints1	Drop Waypoints to Surface		
	Raycast Waypoint Connections		

- 8. Adding invidual Waypoints
 - a. With the Path Manager object selected
 - b. Click "Add a Waypoint" button Waypoint sphere appears



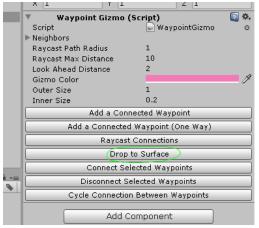
And your selection changes to that waypoint:



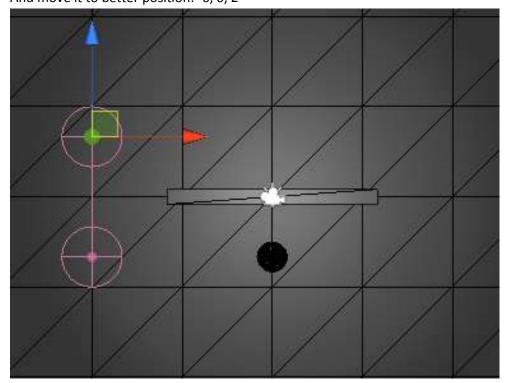
c. Lets move the waypoint Position: -6, 0, -2

♥ ♥ Waypoint54692 Tag Untagged + Layer Default	Static 🔻
▼ 人 Transform Position	a *.
X -6 Y 0 Z -2	
Rotation Y 0 Z 0	
Scale	
X 1 Y 1 Z 1	

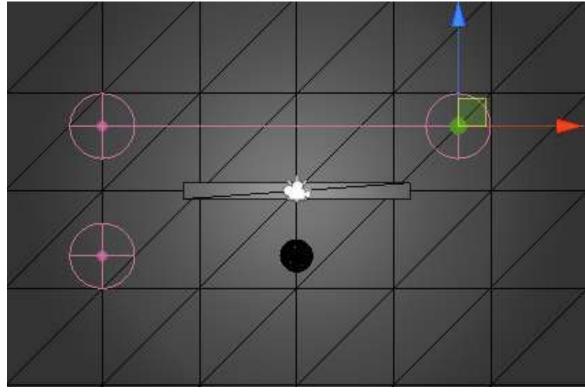
Or you can try pressing button: "Drop to Surface" (falls to ground, or on top of any object below it)



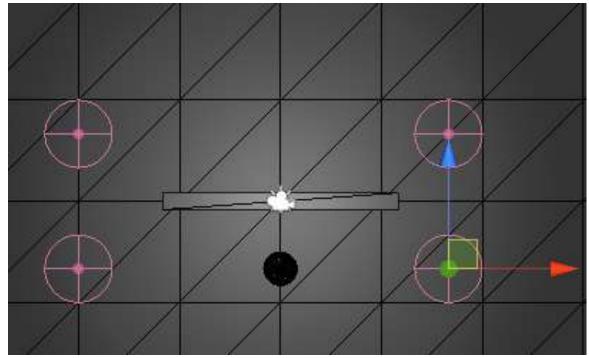
d. Add another waypoint (pressing button "Add Connected Waypoint") And move it to better position: -6, 0, 2



- e. Lets keep adding more, with the latest new waypoint selected:
- f. Add waypoint (pressing button "Add Connected Waypoint") And move it to better position: 5, 0, 2

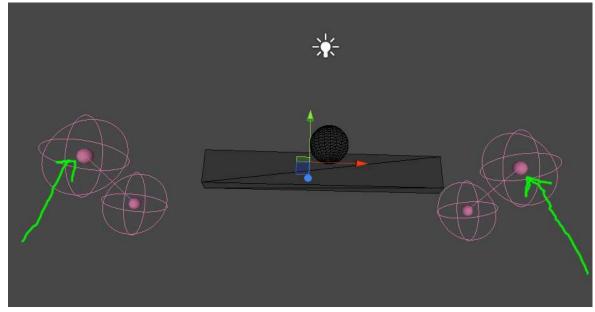


g. Add waypoint (pressing button "Add Connected Waypoint")
 And move it to better position: 5,0, -2

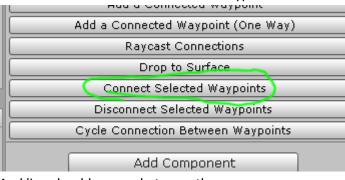


h. Now connect the first and the last waypoints

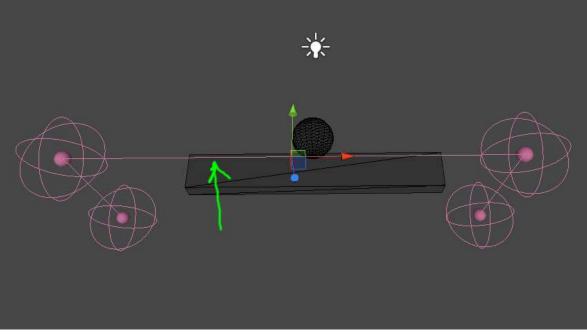
Select both of them (by clicking and holding Control button down or from the hierarchy) (*image is view from below..so plane is not visible*)



i. Then click button "Connect selected waypoints"



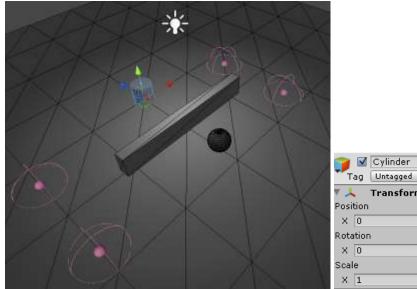
And line should appear between them

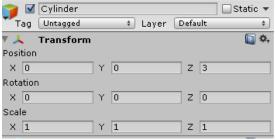


j. Save scene (every now and then..)

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- 9. Adding target object (that the Sphere AI agent will go towards to)
 - a. This target could be our player, mouse pointer position etc..
 - b. For testing, we'll add a cylinder
 Menu: Gameobject / Create Other / Cylinder
 Set cylinder position: 0, 0, 3





- c. Now we make the cylinder as an object for the AI system
- d. With the cylinder selected Menu: RAIN / Add Aspect / Visual

RAIN	Window	ŀ	telp	
Cre	ate AI			J.
Add	Aspect	×	Visual	
Add	Sensor	۲	Tactile	H
Behavior 🕨		۲	Auditory	L
Recast I		۲	Olfactory	
Help	D	Þ	Taste Custom	
	Cre Ado Ado Beh Reo	Create AI Add Aspect Add Sensor Behavior	Create AI Add Aspect Add Sensor Behavior Recast	Create AI Add Aspect Add Sensor Catile Behavior Recast Olfactory Taste

'≔ Hierarchy +=	0 Inspector	, ≟ *≡
Create * Q*All	😭 🗹 Cylinder	Static 🔻
Cube	Tag Untagged	Layer Default +
Cylinder Main Camera Plane	▼ <mark>人 Transform</mark> Position	
Point light	X 0 Y 0	Z 3
V Sphere	Rotation	
Mind	X 0 Y 0	Z O
Obstacle Avoidance Collider	Scale	
Path Manager Sensor	X 1 Y 1	Z 1
Vaypoints1	🔻 🧾 Cylinder (Mesh Fil	ter) 👔 🌣,
Waypoint53055	Mesh	🔠 Cylinder 💿
Waypoint53497	🔻 📒 🗹 Capsule Collider	🛐 🌣.
Waypoint54692	Is Trigger 📃	
Waypoint78101	Material No	one (Physic Material) 🛛 💿
	Center	
	X 0 Y 0	Z 0
	Radius 0.	5
	Height 2	
	Direction Y	-Axis +
	🔻 🛃 🗹 Mesh Renderer	💽 🌣,
	Cast Shadows	
	Receive Shadows	
🖨 Project 💦 🔒 📲	Materials Use Light Probes	
Create * 🤇 🐴 💊		
▶ 🔤 RAIN	Add Ci	omponent
scenes		
Scene_waypoints1		

Results (our cylinder gets 2 extra scripts added: "Entity" and "Decoration")

e. We need to give some name to this object,

Type aspect Name: targetcylinder							
Receive Shadows							
▶ Materials	—						
Use Light Probes							
Entity (Script)	🔯 🔅,						
Script	📰 Entity 💿						
 Decoration (Script) 	💽 🌣,						
Aspect Name	targetcylinder						
Sensation Name	sight						
Add Com	ponent						

10. Creating Mind for the sphere

- a. Menu: RAIN / Behavior Tree / Behavior Tree Editor
 (some errors appear in console window..but everything should still work)
- b. New window opens:

BT Editor	□ × *≡
	Reload
	Currently Selected AI +

c. Select dropdown menu: "Create New Behavior Tree"

BT Editor		■ × *≡
	Reload	
	Currently Selected AI	\$
	 Currently Selected AI 	
	Create New Behavior Tree	

d. Its askind for Behavior tree name: enter name: mindtest1 Then Press Ok

D. L			
Behavior mindtest		ame:	
minutest	-1		
	ж]	Cance	

Now we have one sequence in the tree:

□ × *≡
Reload
mindtest1 \$

e. Select "root" from the tree and change its Name to: followtarget

BT Editor		□ × *≡
BT mindtest1		Reload
SEQ followtarget	mindtest1	\$
	Name:	followtarget
	Repeat:	Never \$
	Precondition:	
	Debug:	

BT Editor					□ × *≡
BT mindtest1			R	eload	
SEG followtaro	et	miņ	dtest1		, ‡
	Create	•	Actions 🕨 🕨	Animate	
	Delete		Condition	Assign	÷
	Cut		Iterator	Audio	E
	Сору		Parallel	Debug	
	Paste		Random	Detect	
	Fable		Selector	Move	
	Create Reference		Sequencer	Timer	
	Set Debug On All Children			Yield	
	Clear Debug On All Children			Custom Action	
_	Clear Debuy On All Children	1]		

f. Right click over "followtarget" on the tree Select Create / Actions / Detect

g. Select the "detect ##" that we just created

Enter Aspect: targetcylinder (this is the object we want to detect/follow) Enter Variable: targetpos (this variable will hold the position)

BT Editor			□ × *≡
BT mindtest1		Reload	
SER followtarget	mindtest1		ŧ
	Name:	detect 57	
	Repeat:	Never	ŧ
	Precondition:		
	Debug:		
	Sensor:		
	Aspect:	targetcylinder	
	Variable:	targetpos	

h. Select "followtarget" again
 Right click over it

Select: Create / Actions / Move

BT Editor				■ × =
BT mindtes	it1		Reload	
d	Create > Delete	Actions ► Condition Iterator Parallel Random Selector Sequencer	Animate Assign Audio Debug Detect Move Timer Yield Custom Action	
		-		

i. Select the "move ##" that we created Change Move Target to: Variable

BT Editor			■ × ==
BT mindtest1		Reload	
SER followtarget	mindtest1		ŧ
- @ detect 57	Name:	move 33	
move 33	Repeat:	Never	\$
	Precondition:		
	Debug:		
	Move Target:	None	\$
	Look Target:	✓ None	ŧ
	Animation:	Vector	
	Animation Layer:	Variable	
	Animation Wrap	Default	ŧ
	Base Speed:	1	

j. Then enter Variable: targetpos

and set Move Speed: 1

BT Editor			×.
BT mindtest1		Reload]
SER followtarget	mindtest1	\$;
- @ detect 57	Name:	move 33	
move 33	Repeat:	Never \$;
	Precondition:		
	Debug:		
	Move Target:	Variable \$	5
	Variable:	targetpos	
	Move Speed:	1	
	Look Target:	None #	5
	Animation:		
	Animation Layer:	0	
	Animation Wrap	Default \$	2
	Base Speed:	1	

k. Select Sphere from the hierarchy and under it select "Path Manager" Then enable: [x] Use Waypoint Collection

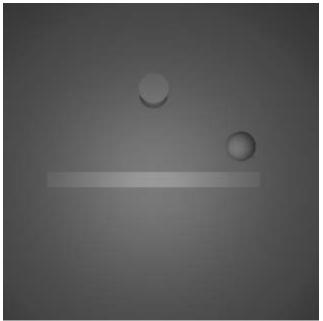
🚝 Hierarchy 💦 👘	🖸 Insp	ector						a -≡
Create * Q*All	1	Path Mana	nger					🗌 Static 🔻
Cube	Tag	Untagged		\$	Layer	Defa	ult	\$
Cylinder	▼ →	Transfor	n					[i] \$,
Main Camera Plane	Position							
Plane Point light	X O		ΠY	0		z	0	
▼ Sphere	Rotation			<u> </u>			Ū	
Mind		1						
Obstacle Avoidance Collider	X O		Y	0		Z	0	
Path Manager	Scale		_				_	
Sensor	X 1		Y	1		Z	1	
▶ Waypoints1	▼	RAINPath	Mar	nager	(Script)		💽 🌣,
		Enough Dis		e	0.1			
		Enough An	-		5			
		Before Mov	e Ang	gle	90			
		Obstacles						
		Radius			0.5			
		ance Smoo			0.3			
		ance Check		r Seco	n 30 2			
		ance Streng	-	. Dev E	-			
		athfinding (avigation G		, Per r			/	
		avigation G ation Grid F		me		/		
	-	aypoint Co				-		
		oint Collect		011	Waypo	nints1		0
		Farget			NONE			÷
Project		Target			NONE			÷
Create *		3D Look						
	Allow	3D Movem	ent					
▶ Cache			A	dd a W	/aypoint	:		

 Select "Mind" under our Sphere object in hierarchy Enter Behavior Tree Filename: mindtest1 Root Name: followtarget

(we gave those names in the behavior tree editor earlier)

≔ Hierarchy _=	Inspector	<u> -</u> ≡
Create * Q*All	👕 🗹 Mind	🗌 Static 🔻
Cube	Tag Untagged 💠 Lay	yer Default +
Cylinder	V 👃 Transform	n *,
Main Camera	Position	
Plane Deiet liebt	X 0 Y 0	Z 0
Point light V Sphere	Rotation	
Mind	X 0 Y 0	Z 0
Obstacle Avoidance Collider Path Manager Sensor	Scale X 1 Y 1	Z 1
▶ Waypoints1	Behavior Tree Mind (S	cript) 🛛 🔯 🖏
		BehaviorTreeMind 💿
		indtest1
	Root Name fo	llowtarget
	Add Compo	nent

- m. Save scene & Hit Play!
- n. Yay!! sphere should be moving right and eventually reach the target (although it keeps hitting the wall on the corner quite a bit..)



11. Done!

This looks like a good resource about waypoints & how to place them: **Artificial Intelligence in Game Design** (powerpoint) <u>http://www.csis.ysu.edu/~john/5895AI/podcasts/Maps.ppt</u>