create a character set, you simply select all of the controllers and go to the menu item **[Character > Create Character Set]**.

While this approach sounds wonderful, I have found that it does cause major confusion with beginning animators. Because Maya is setting keyframes on many attributes, the amount of keyframed data can easily become overwhelming. So my advice to a beginning animator is to make sure you are completely aware of all keyframes being set and not let the computer do the work for you.

This brings me to my preferred method: creating MEL Script buttons on a shelf that allows for ease in the selection of all of the controllers or a specified area of controllers. A button that allows you to select all of the controllers gives you the ability to key the entire character on your key poses. Additional buttons that specify all of the controls in an arm, the leg, or the spine provide the animator a method of keying specific areas quickly.

Summary

7.1 After all the controls have been created, it is important to take time and organize a scene file so that it can be used efficiently during production.

7.2 Make sure that everything is labeled properly in the scene file.

7.3 Create a master control that provides the ability to move, rotate, and scale the character prior to animation.

7.4 Go through every control and optimize them for animation by hiding and locking (if necessary) any attributes that will not be animated.

7.5 You can also go through the scene file and hide any objects that are not necessary, such as IK handles, so that they are not keyframed accidentally during the animation process.

7.6 Creating selection buttons for the controllers is one way to speed up the animation workflow and can be easily done and customized. This provides the animator a quick way of selecting groups of controllers that need to be keyframed.

7.7 Character sets can be used for the same purpose, but can cause more work with the amount of keyframe data that is created.

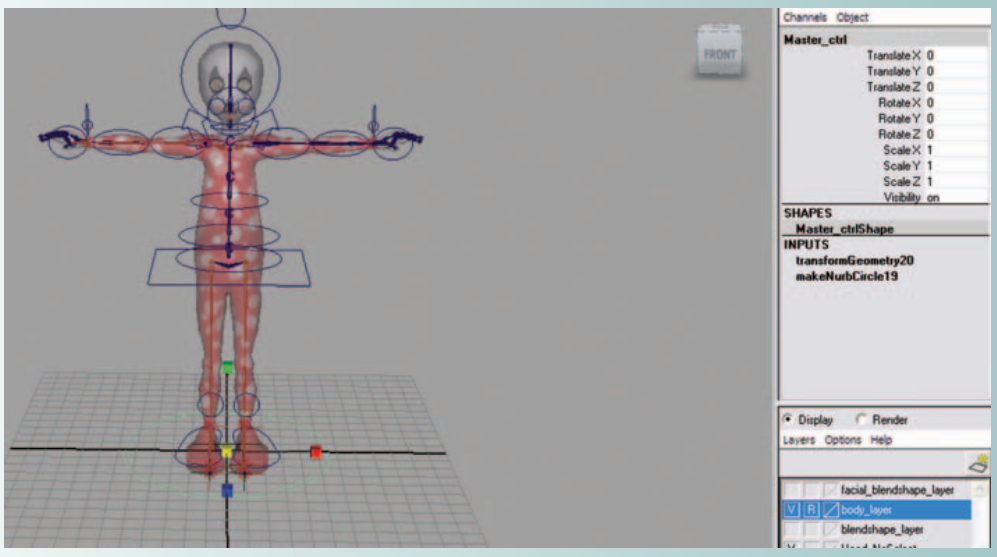
Assignments

Assignment 7.1: Cleaning Up the Scene File for Animation

Set up your work environment by doing the following:

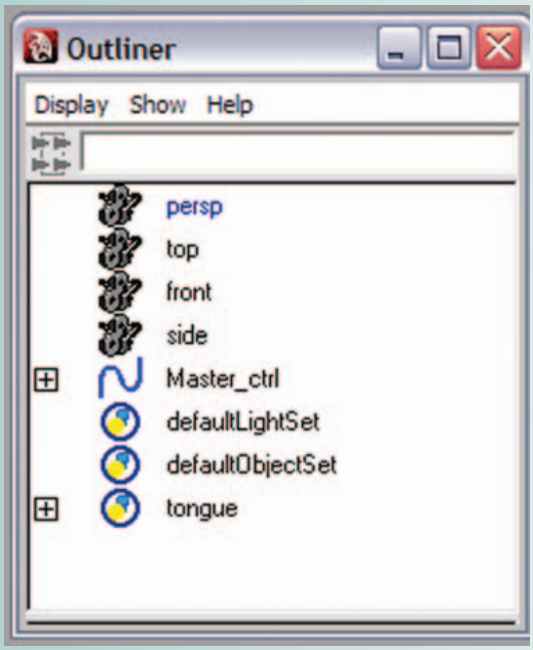
1. Open Maya and set your project.
   - From your computer's desktop, go to **[START > PROGRAMS]** and **select** Maya.
   - Once Maya is open go to **[File > Project > Set ...]** and browse to your project folder then **click OK**.

2. Open your last saved file: Go to **[File > Open]** and **select** *06_asgn07.ma*
3. Continue working in X-ray Joints Mode.
4. Make sure that your geometry is placed on a layer and that the layer is set to **R** for reference so that you are unable to select the geometry by mistake when working.
5. To make selection easier open your outline by going to **[Window > Outliner]**.
6. Create a master control for the rig by doing the following:
   - First create the controller by doing the following:
     i. Go to **[Create > NURBS primitives > Circle]**.
     ii. In the channel box, rename the circle *Master_ctrl*. (You can replace the word *Master* with your character's name. For example, my character's name is Bobo, so I would rename the circle *Bobo_ctrl*).
     iii. In perspective view, **select** the move tool by pressing (**w**) and position the *Master_ctrl* into place around the feet of the character.
     iv. Use the scale tool by pressing (**r**) and resize *Master_ctrl*. (This control should be scaled large enough that it is OUTSIDE of the character's feet to make it easy to select.)
     v. With the *Master_ctrl* selected, go to **[Modify > Freeze Transformations]** (to return both translate and rotate values to 0 and the scale values to 1).



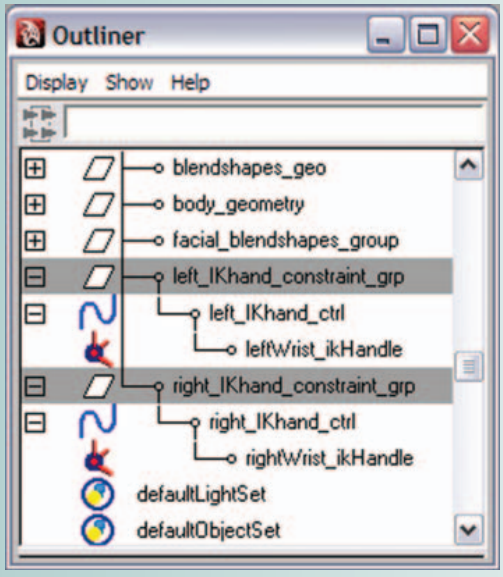
Creating the Master_ctrl.

7. Parent all rig controls and geometry to the *Master_ctrl* by doing the following:
   - In the outliner, **select** the *right_IKHand_ctrl*, hold down the (ctrl) key and **click** on the *left_IKHand_ctrl*, the *rightArm_ikHandle*, the *leftArm_ikHandle*, the *spine_curve*, the *spine_ikHandle*, the *upperBody_ctrl*, the *IK_Spine1*, *left_foot_ctrl*, *right_foot_ctrl*, all of your geometry, and the *master_ctrl*.
   - Press the (**p**) key to parent. (This makes the *master_ctrl* parent to all of the other selections.)



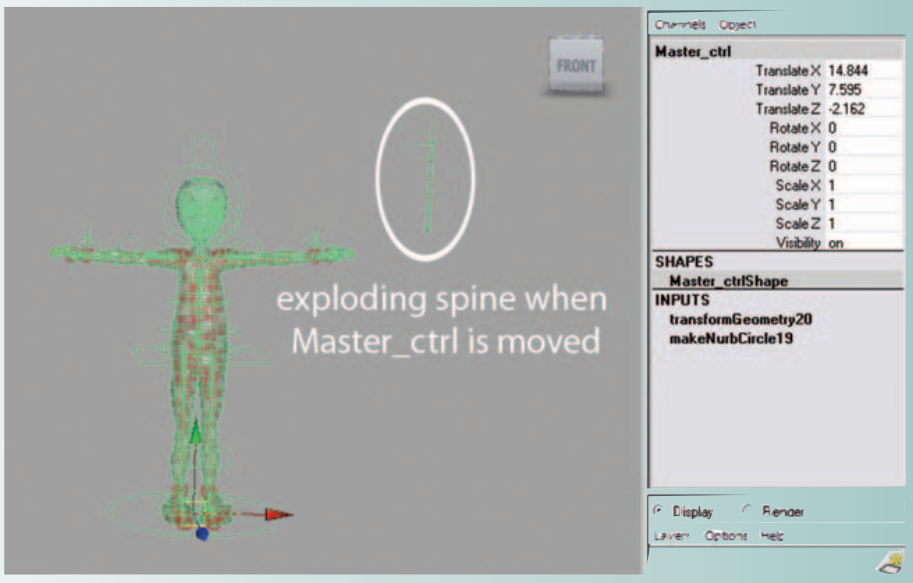
The OUTLINER hierarchy after parenting everything to the Master_ctrl.

8. Add constraint groups to the IK arm controls to assist in object interaction when animating by doing the following:
   - In the perspective window, **select** the *right_IKhand_ctrl*, and press (**ctrl + g**) to group it.
   - In the channel box, rename group1 *right_IKhand_constraint_grp*
   - In the perspective window, **select** the *left_IKhand_ctrl*, and press (**ctrl + g**) to group it.
   - In the channel box, rename group1 *left_IKhand_constraint_grp*



The OUTLINER hierarchy after creating the constraint groups for the IKhand controls.

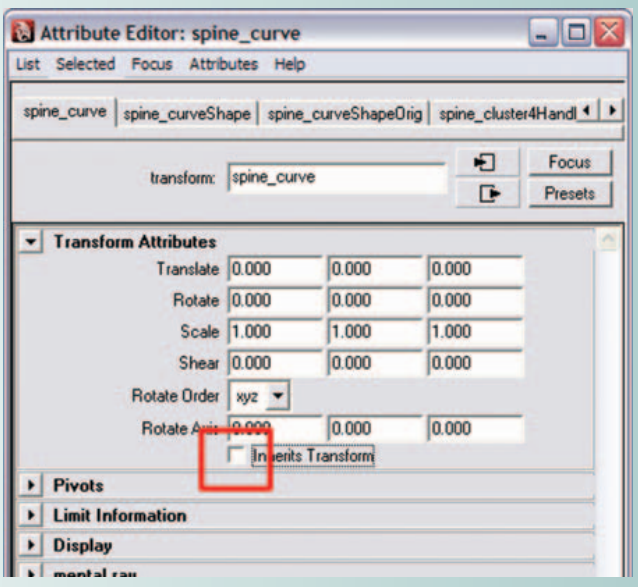
9. If the *Master_ctrl* is moved at this point, the spine explodes out of the rig because the spine curve has two inputs of control: the cluster deformers (controlling the CVs) and the *Master_ctrl* (acting as a parent node). This leads to double transformations in the rig (moving twice as far as everything else).



The spine moves out of the skeletal structure because it is being controlled by both the skin deformer and the parent controller.

To solve this problem, do the following:

- In the outliner, hold down the shift key and **click** on the **plus sign** (**+**) next to the *Master_ctrl* to open the hierarchy and display the children.
- Find the *spine_curve* and **click** on it to **select** it.
- Press (**ctrl + a**) to open the attribute editor.



Unchecking the Inherits Transform on the spine curve in the Attribute Editor.

i. **Select** the *spine_curve* tab.

ii. Under *Transform Attributes* set the following:

1. Remove the check next to *inherits transform*. (This makes the *spine_curve* free from the parent *Master_ctrl* transformations.)

10. Clean up each controller in the table below by doing the following:

- In the channel box, **click** on the words of the channel(s) that are not used during animation for that controller.
- If the channel is white, hold down the **RMB** (right mouse button) and **choose** *Lock and Hide selected*.
- If the channel is orange, blue, yellow, or purple, hold down the **RMB** (right mouse button) and **choose** *Hide selected*.

CONTROL NAME	*LOCK AND/OR HIDE (select in channel box, rmb)*
Master_ctrl	**visibility**
left_foot_ctrl, right_foot_ctrl *upperBody_ctrl** *upper_spine_ctrl, lower_spine_ctrl** *spine_shoulder_ctrl* *hips_ctrl* *left_IKhand_ctrl, right_IKhand_ctrl** *eye_ctrl*	**ScaleX, ScaleY, ScaleZ, and visibility**
*head_ctrl** *neck_ctrl** *FK_left_wrist_ctrl, FK_right_wrist_ctrl** *FK_left_elbow_ctrl, FK_right_elbow_ctrl** *FK_right_shoulder_ctrl, FK_left_shoulder_ctrl** *left_FKarm_ctrl, right_FKarm_ctrl**	**TranslateX, TranslateY, TranslateZ, ScaleX, ScaleY ScaleZ, and visibility**
left_eye_ctrl, right_eye_ctrl *left_IKelbow_ctrl , right_IKelbow_ctrl** *left_clavicle_ctrl, right_clavicle_ctrl* *left_knee_ctrl, right_knee_ctrl*	**RotateX, RotateY, RotateZ, ScaleX, ScaleY ScaleZ, and visibility**
right_finger_ctrl *left_finger_ctrl* *right_FKIK_Switch* *left_FKIK_Switch* *face_ctrl*	**TranslateX, TranslateY, TranslateZ, Rotated, RotateY, RotateZ, ScaleX, ScaleY ScaleZ, and visibility**
*** remember to ONLY hide anything with color on these controllers.** Do NOT lock anything with color as it may prevent the control from working properly.	

11. Hide IK so that during animation, they are not accidentally selected and keyframed.

- Select the spine_ikHandle, spine_curve, left_heelPivot, right_heelPivot, leftArm_ikHandle, rightArm_ikHandle, leftWrist_ikHandle, rightWrist_ikHandle, leftClavicle_ikHandle, rightClavicle_ikHandle, and press (ctrl + h) to hide them.

12. Save your file as *07_asgn01.ma*.

Assignment 7.2: Preparing the Scene File for Skinning

Set up your work environment by doing the following:

1. Open your last saved file: Go to **[File > Open]** and **select** *07_asgn01.ma*
2. Continue working in X-ray Mode.
3. Make sure that your geometry is placed on a layer and that the layer is set to R for reference so that you are unable to **select** the geometry by mistake when working.
4. To make selection easier open your outline by going to [Window > Outliner].
5. Prepare the character for skinning.
   a. Create a set of skinnable joints by doing the following:
      i. Go to **[Edit > Select all by Type > Joints]**.
      ii. Hold the cursor over the outliner and press **(f)** to frame the selected joints.
      iii. In the outliner, deselect the following joints from the selection by holding down the **(ctrl)** key and clicking on each of the following joints:

      The FK spine:

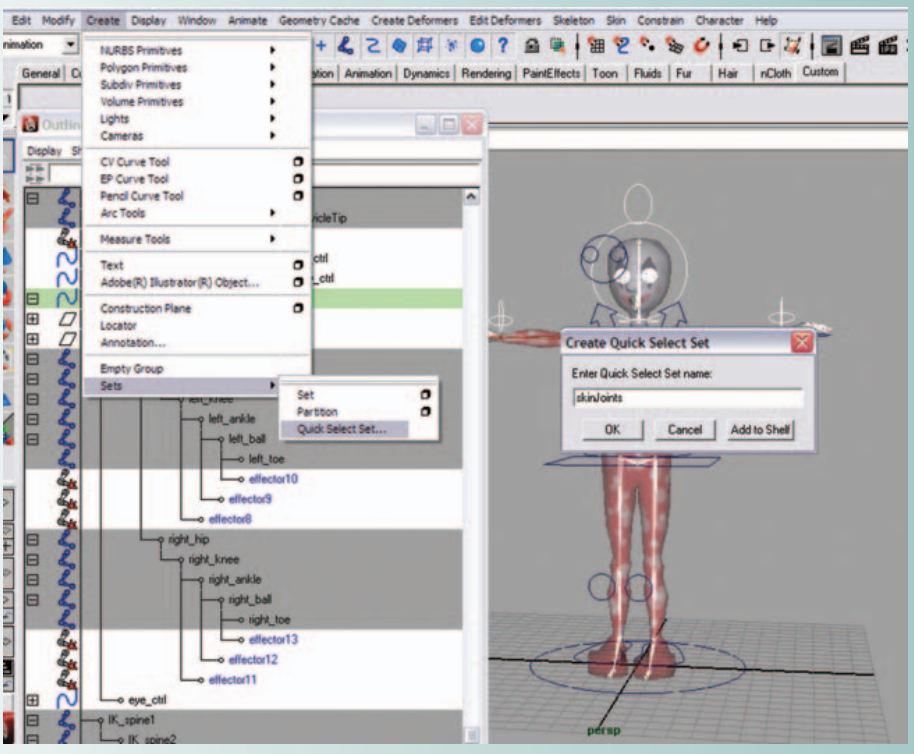
      FK_spine1, lower_spine_ctrl, upper_spine_ctrl, FK_spine6.

      The left IK arm:

      IK_left_shoulder, IK_left_elbow, IK_left_wrist, IK_left_palm.

      The left FK arm:

      FK_left_shoulder_ctrl, FK_left_elbow_ctrl, FK_left_wrist_ctrl, and FK_left_palm.



Creating a Quick Select Set for the skinnable joints.

The right IK arm:

IK_right_shoulder, IK_right_elbow, IK_right_wrist, IK_right_palm.

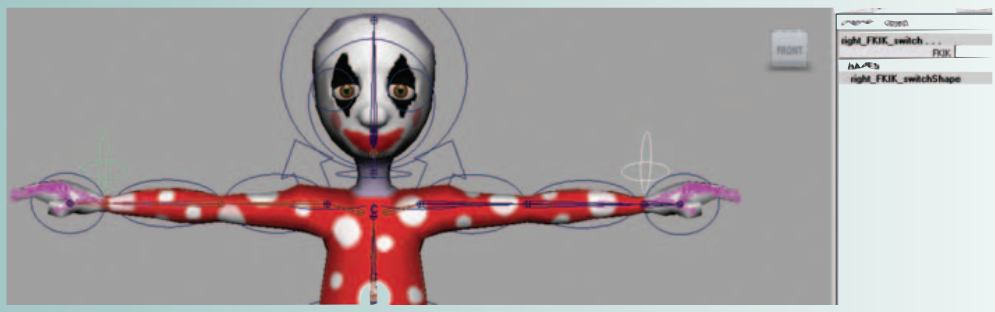
The right FK arm:

FK_right_shoulder_ctrl, FK_right_elbow_ctrl, FK_right_wrist_ctrl, and FK_right_palm.

iv. Go to **[Create > Sets > Quick Select Sets]**.

- Enter Quick Select Set name: **skinJoints**.
- **Click "OK"**.

6. Turn IK off in the arms before binding. This is important since IK rotates the joints immediately. Because the arm position can be altered by the IK solver, it is best to key FK position in the arms for skinning. In the perspective window, **click** on the *left_FKIK_switch*, hold down the **(shift)** key and **click** the *right_FKIK_switch*. In the channel box, set the FKIK attribute to "**0**" to turn IK off.



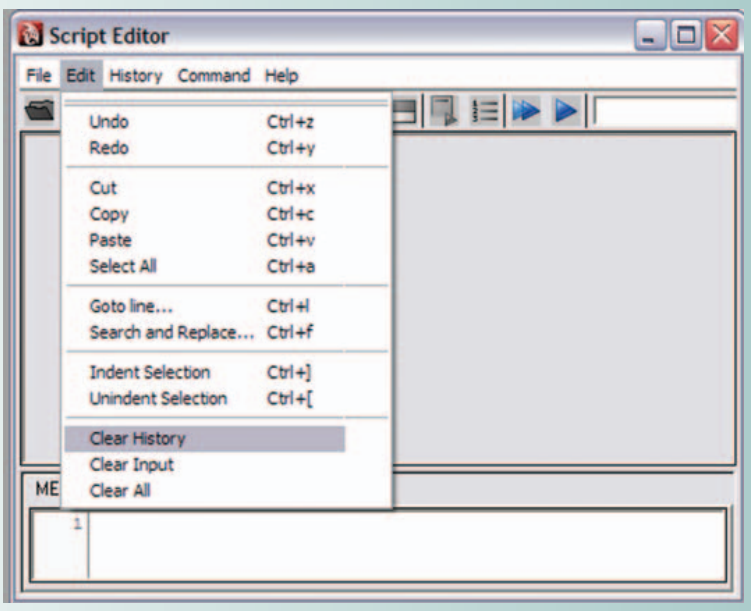
Turning IK off in the arms.

7. Save your file as *07_asgn02.ma*.

Assignment 7.3: Creating Additional Tools for Animation (Optional)

Set up your work environment by doing the following:

1. Open your last saved file: Go to **[File > Open]** and **select** *07_asgn02.ma*.
2. Turn X-ray mode off if it isn't already.
3. Make sure that your geometry is placed on a layer and that the layer is set to "R" for reference so that you are unable to **select** the geometry by mistake when working. (It should be by now!)
4. To make selection easier open your outline by going to **[Window > Outliner]**.
5. Creating selection MEL buttons by doing the following:
   a. With nothing selected (**click** in an empty area of the perspective window to be sure) go to **[Window > General Editors> Script Editors]**.
   b. In the Script Editor, go to **[Edit > Clear History]**.

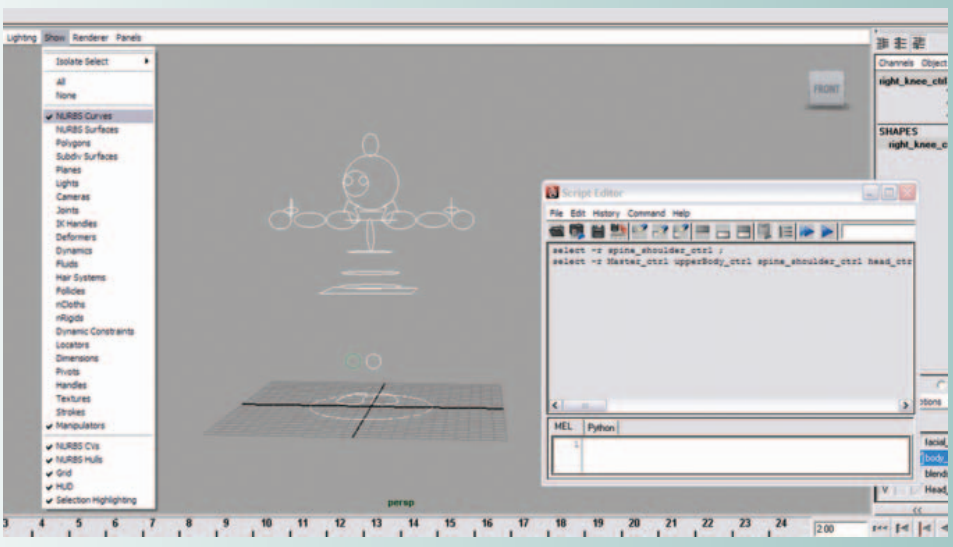


The Script Editor.

c. In the perspective window, go to **[Show > None]**.

d. In the perspective window, go to **[Show > NURBS Curves]**.

e. In the perspective window, LMB **click** + drag around all curves to **select** them.



Selecting all of the curves in the perspective window.

f. In the shelf area, **click** on the CUSTOM tab.

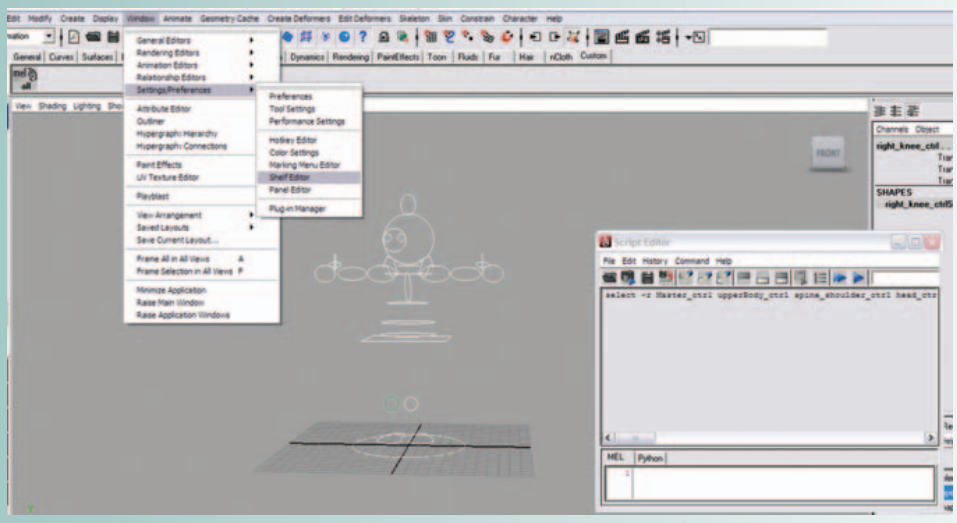
g. In the Script Editor, LMB **click** + drag the entire row of MEL that appears to highlight the selection (this is the command to **select** all of the NURBS curves).

h. In the Script Editor, **MMB click** + drag the entire row of MEL onto the CUSTOM shelf.

   a. Save script to shelf as type: **choose MEL**.

i. Add a name to the shelf button by going to **[Window > Settings/Preferences > Shelf Editor]** and enter the following:

   Icon Name : type 'all'.

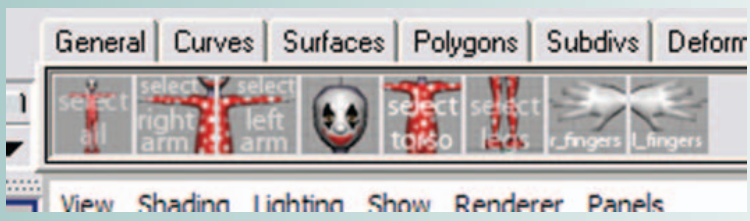


Creating a customized selection button.

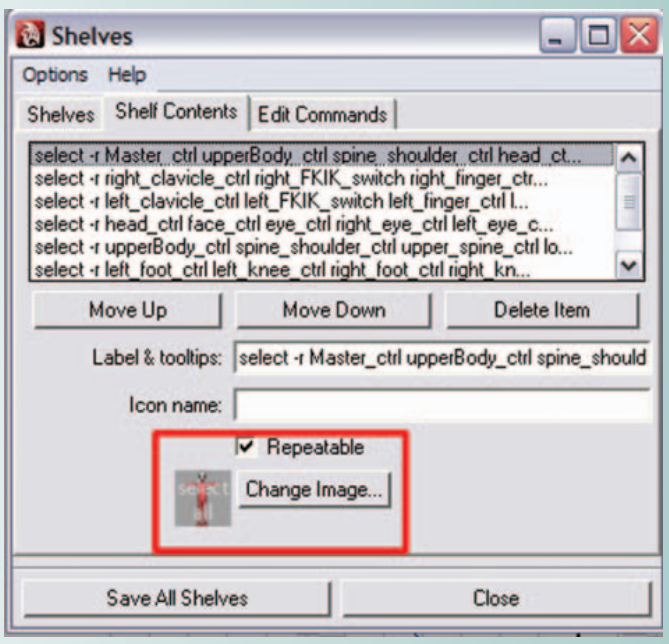
These steps can be repeated for different sections of the body controls. For example, the hand, elbow, and shoulder FK. Controls can be made into a shelf button for each arm. The spine, neck, and head controls should be a button also, as well as each IK arm and elbow, in addition to the IK foot and knee.

6. Save your file as *07_asgn03.ma*

As an added challenge (which will impress all of your friends) you can create your own shelf icons in a graphics software package. The images must be pixel dimensions of 32 × 32 pixels and must be saved as a bitmap image. These are placed in the icons folder of your Maya preferences. In the Shelf Editor, **click** on **Change Image** to browse to the icons folder in your preferences.



Creating customizable shelf icons.



Using the shelf editor to change the icon image.

If you are not sure where these are stored on the computer, go to [**Window > Settings/Preferences > Preferences**] **click** the save button. Then go to [**Window > General Editors > Script Editor**]. The Script Editor will give you the path to the directory where your preference folder is located.