Programming with Scratch
Assignment 2: The Cat Walk Project
(Project adapted from Trevon Blunn)

In this exercise, you will use utilize the basic feature of Scratch to control a Sprite using the keyboard. Follow the step-by-step instructions carefully and note that only the final program needs to be turned in.

Your completed project must be submitted via Interact by the due date and will be graded using the rubric shown below. Save your final program as username_catwalk and include "catwalk" in the assignment description.

Good luck and have fun!

Grading Rubric

| CATEGORY	4	3	2	1
Keyboard Control	Sprite is able to fluidly and properly move up, down, left, and right using the arrow keys.	Sprite is able to move in all four directions but movement may not be fluid and/or key controls may not work properly.	Sprite is unable to move in all four directions and/or movement is not fluid or properly controlled from the keyboard.	Sprint is unable to move.
Sprite Costumes	Sprite changes costumes (appearance) when moving left, right, up, and down; Sprite faces the direction it is moving (left or right).	Sprite changes costumes (appearance) when moving left, right, up, and down; Sprite does not face the direction it is moving (left or right).	Sprite does not change costumes (appearance) when moving left, right, up, and down; Sprite faces the direction it is moving (left or right).	Sprite does not change costumes (appearance) when moving left, right, up, and down; Sprite does not face the direction it is moving (left or right).
Use of Scripts	Final project comprised of one or two scripts that incorporate all necessary commands.	Final project comprised of three or four scripts that incorporate all necessary commands.	Final project comprised of more than four scripts that incorporate all necessary commands.	Final project comprised of more than four scripts that do not incorporate all necessary commands.

Step 1: Simple movement

In Scratch the figure is called a Sprite. One of the easiest programs to make is one that moves a sprite on the screen.

1. Click on the yellow **Control** button in the topic box
2. A series of control instructions will appear
3. Select the first one **when flag is clicked** and drag it to the Scripts area of the screen.
4. Next click the blue **Motion** button to the left of the Control button to evoke the motions instruction set
5. Drag the **move 10 steps** button across and lock it underneath the earlier command. Your program should look like the one on the right.
6. Click the **green flag** near the top right of the Scratch screen to run your program.
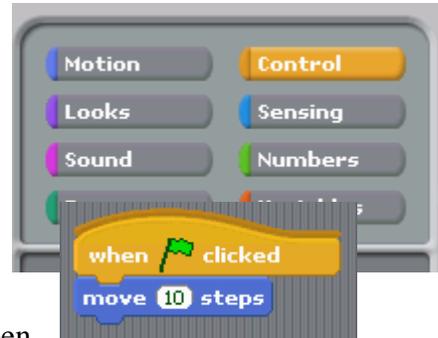
Step 2: Amending the program

1. You can change the amount of movement by altering the value in the movement command. Change the movement value from 10 to 40.
2. Click the Control topic button again and select the wait 1 secs command
3. Click the Motion topic button and add the point in direction 90 command below it.
4. Click on the arrow beside the 90 and select -90 from the list.
5. Add another movement command and change the value to match the first
6. Add another wait command, and then another 'point' command.
7. Finally, at the top of the screen where there is a small image of the sprite, click the middle button. This makes the sprite change direction to match his movement.

Click this button so that the sprite faces the other direction when it changes direction
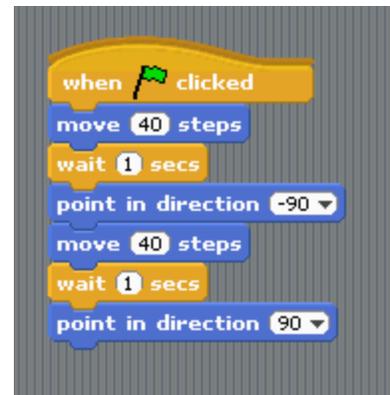
Step 3: Repeated movement (using forever)

Often we want the sprite to be animated for a period of time. In order to get the script that we have written to loop use the Forever instruction.
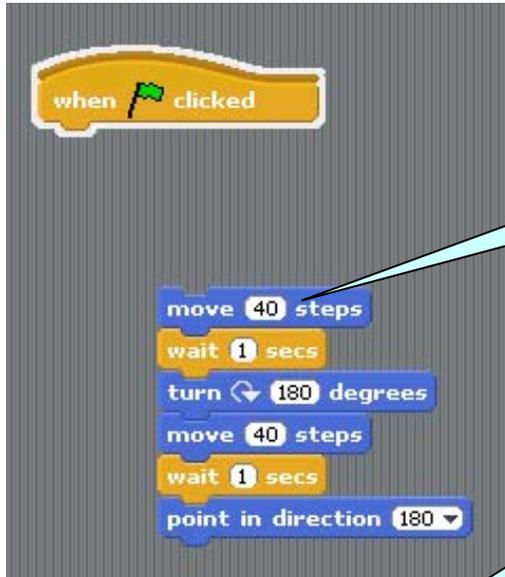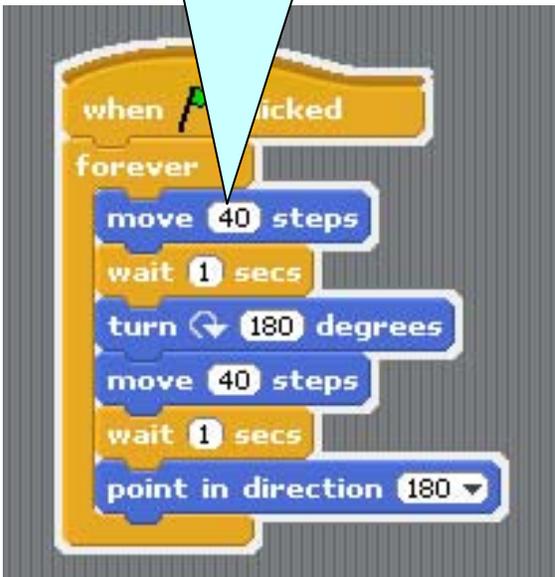

Step 1 - click the **move 40 steps** command and drag the script apart

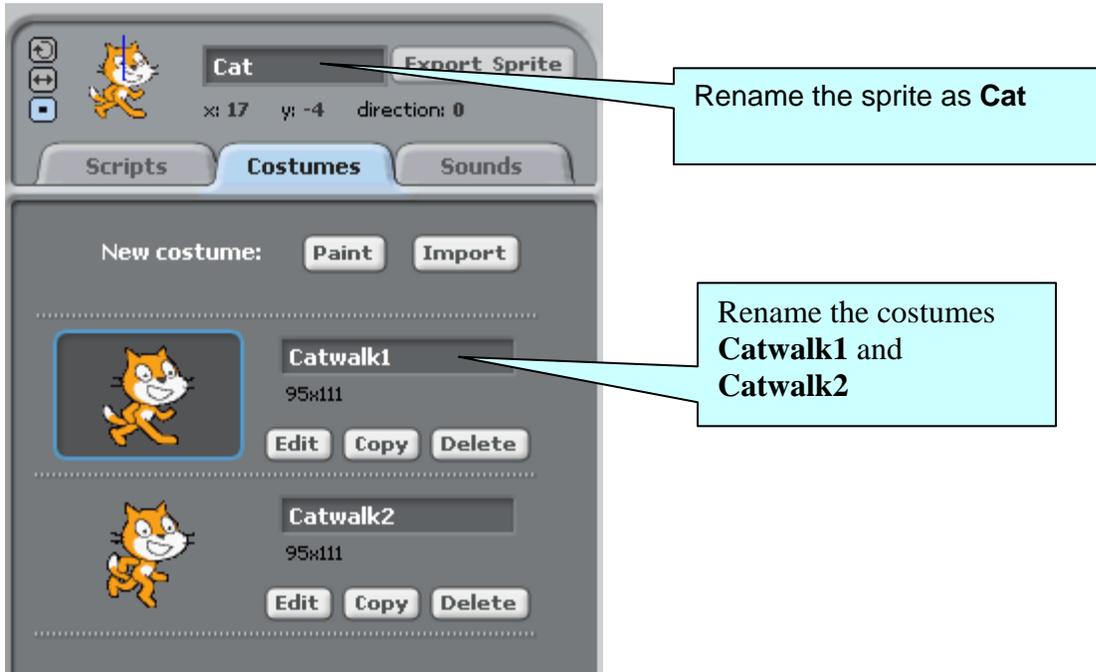**Step 2** - Select the **Forever** instruction from the Control topics
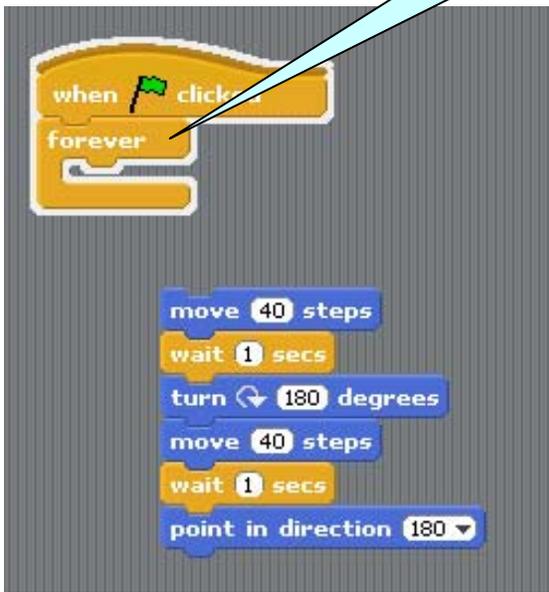
Step 3 – Drag the set of instructions that you made previously back inside the **forever** instruction
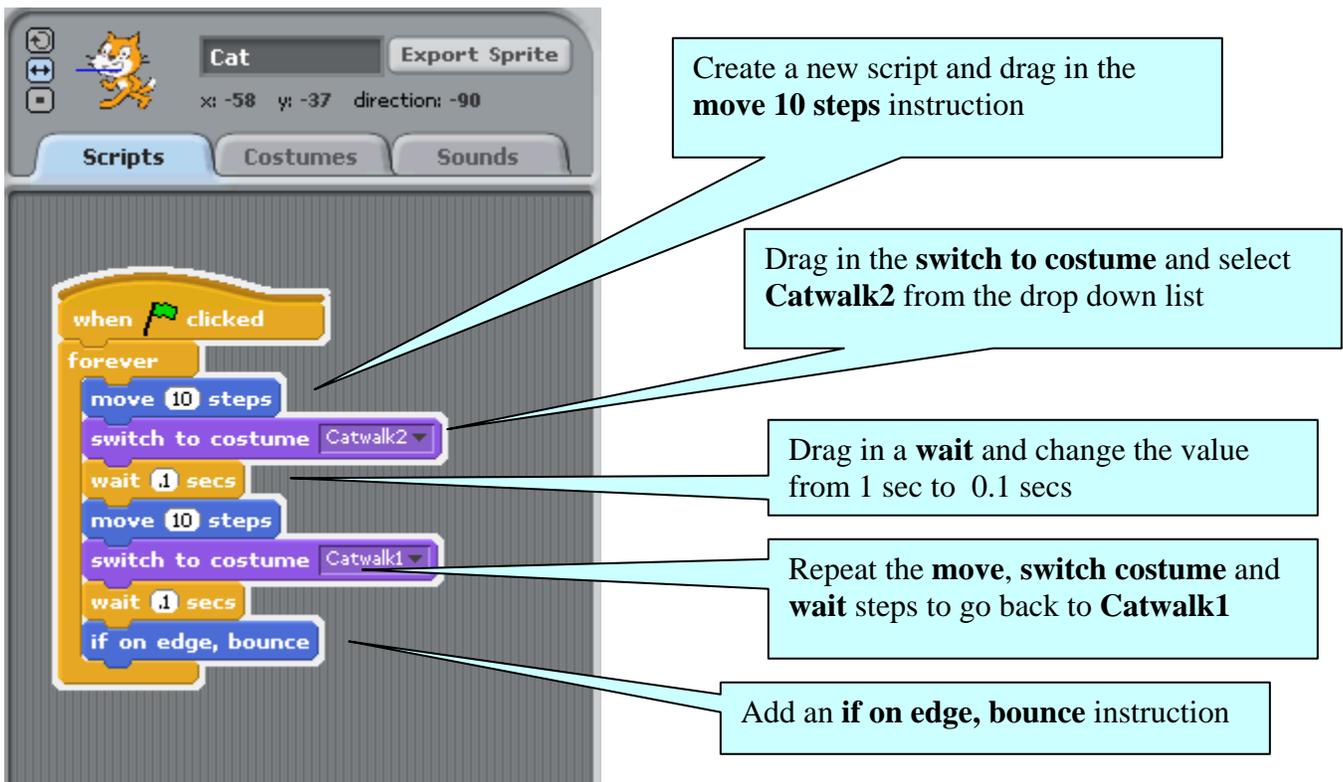
Step 4: Getting the sprite to walk (using costumes)

Click on the costumes tab – note that the cat sprite comes with two costumes

Rename the sprite as **Cat**

Rename the costumes **Catwalk1** and **Catwalk2**

Before completing this exercise dump your existing script into the left had side of the screen (this will delete it)

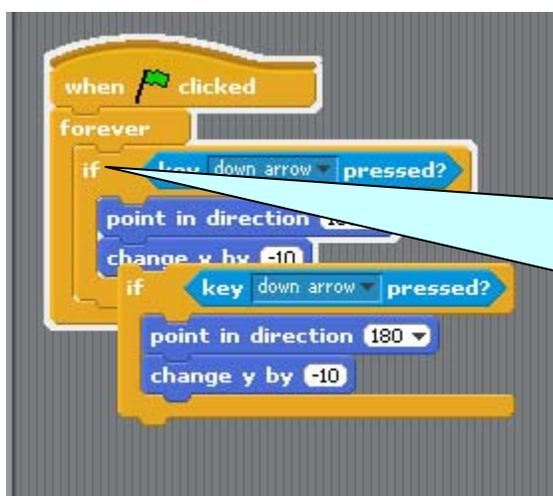Create a new script and drag in the **move 10 steps** instruction

Drag in the **switch to costume** and select **Catwalk2** from the drop down list

Drag in a **wait** and change the value from 1 sec to 0.1 secs

Repeat the **move**, **switch costume** and **wait** steps to go back to **Catwalk1**

Add an **if on edge, bounce** instruction

Step 5: Using the keyboard to control your sprite (using if condition instruction)

It is possible to control your sprite using the mouse keys. There is a small pointer next to the Sprite symbol at the top of the screen which can be set to any angle thereby determining the natural direction of movement of the sprite. In this exercise we want the Sprite to move exactly up and down vertically or side to side horizontally so we will use the **change x by** and **change y by** instructions to order to ensure the correct movement of the Sprite

Before completing this exercise dump your existing script into the left had side of the screen (this will delete it)

Start a new script with the **when green flag** pressed and **forever** instructions

Choose the **if condition** instruction and drag in the **key pressed** instruction from the **sensing** topics. Set the **key pressed** to **down arrow**

Add the **point in direction** and **change y by set** instructions **Set point in direction** to **180** and **change y by** to **-10**

We will now copy the main part of the script then edit the sub script for each movement of the mouse determined by each of the respective four arrow keys

Click on the **copy (stamp symbol) tool** then click on the word **if** in the script. This will create a copy of that part of the script. Repeat this process twice more in order to create the scripts for each different movement of the sprite

Drop the three new copied sets of instructions inside the **forever** instruction (not inside the existing **If condition** instruction)

Set the **key pressed** to **up arrow**
Set the **point in direction** to **0**
Set the **change y by** to **10**

Set the **key pressed** to **right arrow**
Set the **point in direction** to **90**
Set the **change y by** to **10**

Set the **key pressed** to **left arrow**
Set the **point in direction** to **-90**
Set the **change y by** to **-10**

Click the green flag button.
It should now be possible to drive your cat sprite around the screen using the arrow keys

Step 6: Cat walking with keyboard control

Looking back over steps 4 and 5 it should be possible to make a script combining what you have already learned that allows the Cat sprite to walk around the screen.
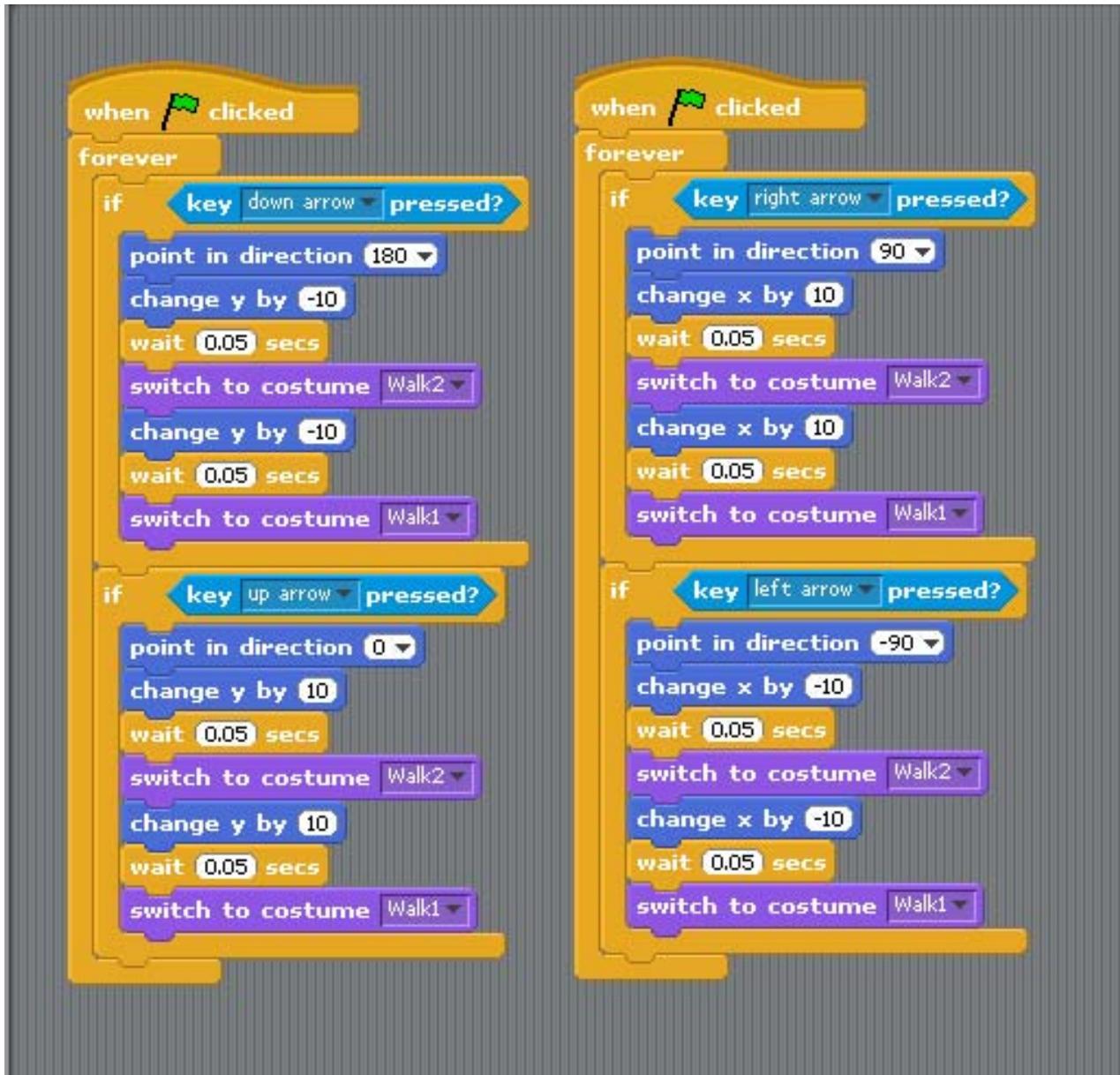
Note that two scripts have been created here so it would display on one page and it is possible to combine all of this into one script.

Save your finished project and submit it by the due date.