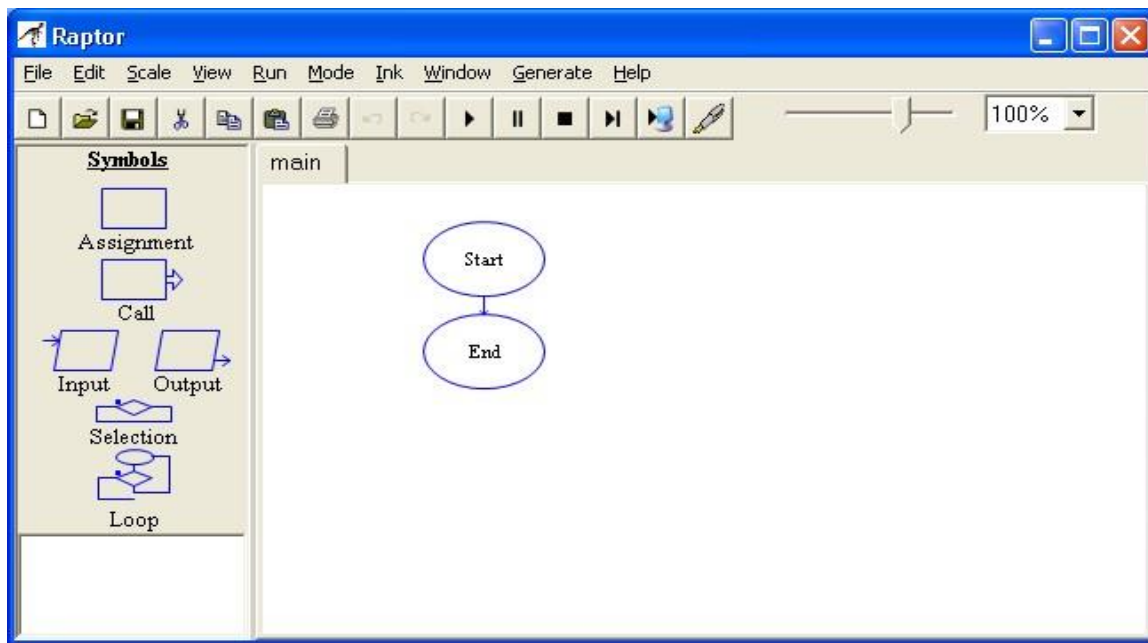


## Lesson 1 Lab 3 – Flowcharts

This lab requires you to think about the steps that take place in a program by designing a flowchart. While designing flowcharts can be done with paper and pencil, one mistake often requires a lot of erasing. Therefore, a flowcharting application such as Raptor or Visio should be used. This lab will give you a brief overview of Raptor. Read the following program prior to completing the lab.

Write a program that will take in basic information from a student, including student name, degree name, number of credits taken so far, and the total number of credits required in the degree program. The program will then calculate how many credits are needed to graduate. Display should include the student name, the degree name, and credits left to graduate.

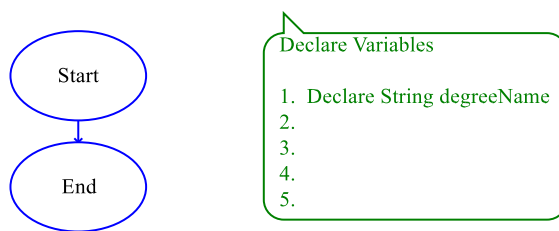
**Step 1:** Start Raptor; notice the Raptor screen. This window is your primary tool for creating a flowchart. Prior to adding symbols, save your document by clicking on File and then Save. Select your location and save the file as *Lab 1-3*. The *.rap* file extension will be added automatically.



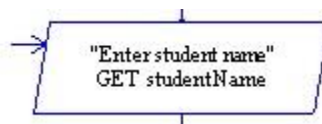
**Step 2:** Notice the MasterConsole screen. This window is used to show your program output once your flowchart is completed. The Clear button will clear the console to view a fresh run of your program.



**Step 3:** Return to the Raptor screen to begin adding symbols into your flowchart. Your flowchart should follow the pseudocode in Lab 1-2, Step 6. While a rectangle is normally used for declaring variables, there is no easy way to do this in Raptor. Since this is an important part of flowcharting, we will do this using a comment box. To do this, Right-Click on the Start symbol and select Comment. In the Enter Comment box, type the variables your program will need. Below is a start to how it should look.



**Step 4:** The next step in your flowchart should be to ask for user input. Click the Input Symbol on the Left and Drag and Drop to the flow line between Start and Stop. Double Click on the Input Symbol to begin entering information. Enter `Enter student name` in the top box. Enter `studentName` in the variable box. Below is how it should look.



**Step 5:** Continue the Step 4 directions for all your input statements, changing each Input symbol to reflect the appropriate user interaction.

**Step 6:** The next step in your flowchart is to process any calculations that exist. Click on the Assignment symbol and drag it to the flow line between the last input statement and the end symbol. Double click on the Assignment symbol to enter your code. In the Set box, put the

name of your storage variable. In the To box, put the expression part of your formula. Below is how it should look.



**Step 7:** The next step in your flowchart is to display the requested output to the screen. Click the Output symbol and drag it to the flow line between the assignment statement and the end symbol. Double click on the Output symbol to enter your code. Under Output Type, select Output Expression since we want to display both a sentence and the contents of a variable. In the box, type "Student name is " + studentName. Below is how it should look once you click Done.



**Step 8:** Continue the Step 7 directions for all your output statements, changing each Output symbol to reflect the appropriate requested output information.

**Step 9:** Once your flowchart is complete, click on Run and then Execute to Completion on the Raptor menu. Follow the flow of your program to see if it processes properly. Your Master Console window should show output similar to

```
Student name is Bill Jones
The degree program is Computer Programming
Credits left to graduation is 39
----Run finished----
```

**Step 10:** The final step is to upload your completed RAPTOR program (.rap file) as your lab submission.