Flow++ Tutorial

In this initial tutorial we will start with the basics, explain the interface and do a hello world code.

The user interface

The interface is the one presented in **Fig. 1.** It consists of three parts: the editor, console and file textboxes.

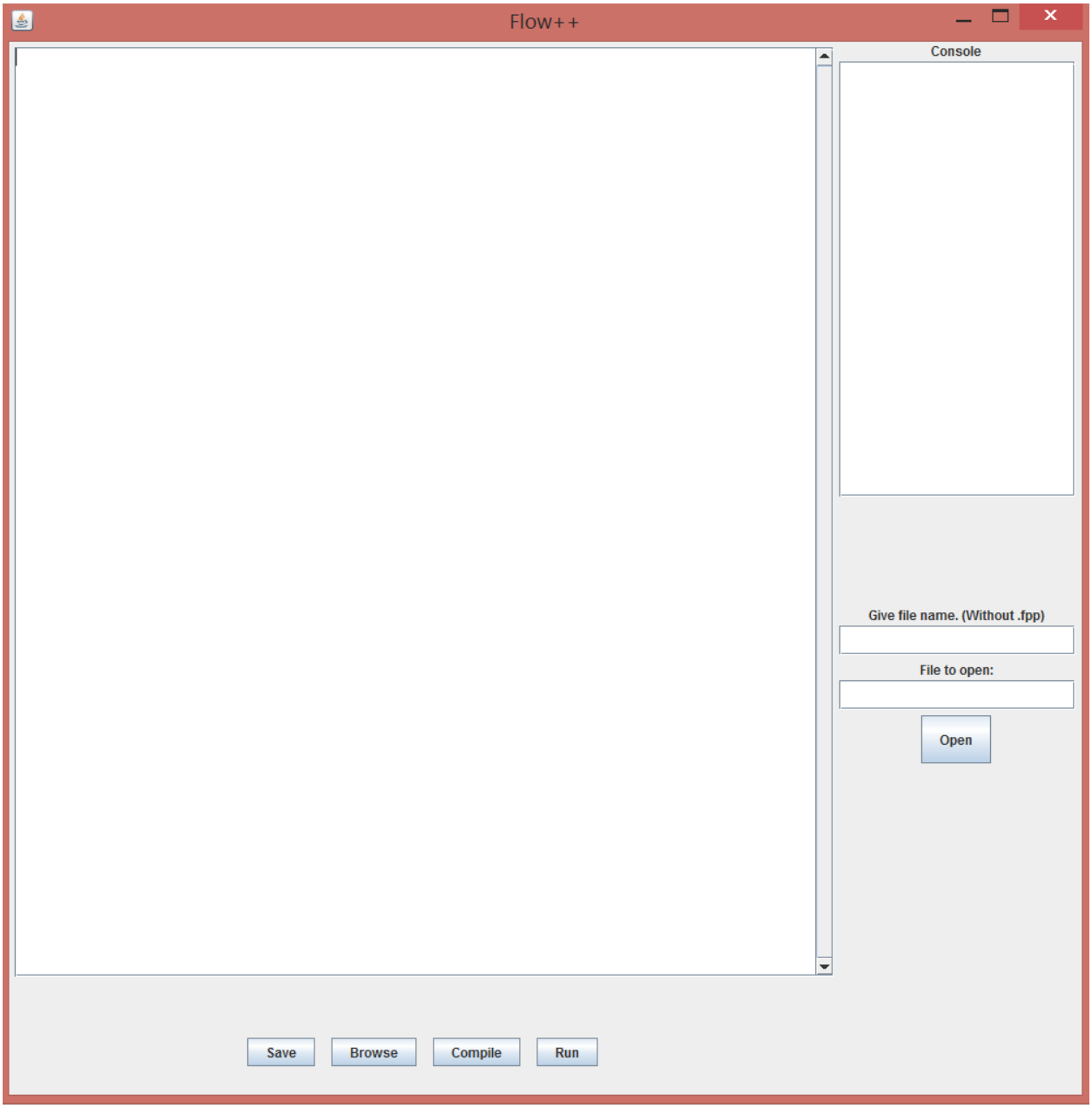

Fig 1: Flow++ user interface

The first part of the interface that will be discussed is the editor. In this area all the code will be written and the code can be saved, compiled and executed (run). The browse button will generate a random code.

The next area is the console, this area will inform if any error occurs and if the code ran correctly. When no problem is detected in the code it will indicate that it is done and that the syntax as correct. If any error were to occur then it will appear in red lettering.

The final area is the file textboxes. In the top textbox you place the name of the file of the code. A name must be given for the user to be able to save the file. Also the user must save the file at least once to be able to run the code. It is not necessary to place the extension .fpp when naming the file since the program does it automatically. In the bottom textbox you can place the name of a previous code that has already been saved, in this case the extension .fpp is necessary that it be placed.

Hello World!

The following code will be used for the tutorial and will be explained below.

Code 1: Sample Hello World

```
Genesis(HelloWorld)
a='Hello World'
Insert(a,Start,End)
ShowItToMe(HelloWorld)
Fatality(HelloWorld)
```

Note: In this tutorial the term **node** indicates a component of the flowchart. Each node has a value and has a previous node and a next node. Example of nodes is **Start** and **End**, they are the nodes at the beginning and the end of the flowchart. The user does not have to create these nodes for their flowchart since Flow++ already has them implemented automatically.

The first command you must notice is **Genesis(HelloWorld)**. This command indicates the beginning of a flowchart. Whenever it is placed a separate flowchart is made and any previous flowchart is considered finished by the compiler. The parameter **HelloWorld** is the name of this flowchart.

a='Hello World' is a variable, you can only place variables as parameters in Flow++, the only exceptions to this is **Genesis, ShowItToMe** and **Fatality** since the receive the name of a flowchart. Variables are case sensitive and the value assigned must be a string inside single quotes.

The command **Insert(a,Start,End)** inserts a node into the flowchart. The first parameter indicates the value of that node, the next parameter is the node previous to this one and the last parameter is the node after this one. In Flow++ **Start** and **End** are reserved words that indicate the beginning and end of the flowchart.

ShowItToMe(HelloWorld) receives the name of a flowchart and it displays it in a separate window.

Fatality(HelloWorld) receives the name of a flowchart and deletes it.

Be careful: If Fatality is used on a flowchart and later in the code **ShowItToMe** is called on that particular flowchart it will not be displayed, it is completely gone at this point.

Now, write **Code 1** in the editor and save it as **HelloWorld** and press save. **Fig. 2** shows where to place the name of the code. Once this is done press run and the flowchart should appear next to the compiler window. **Fig. 3** shows the output.

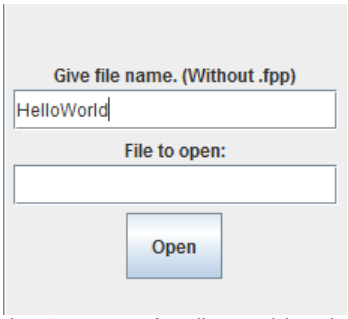

Fig. 2: Name of Hello World code.

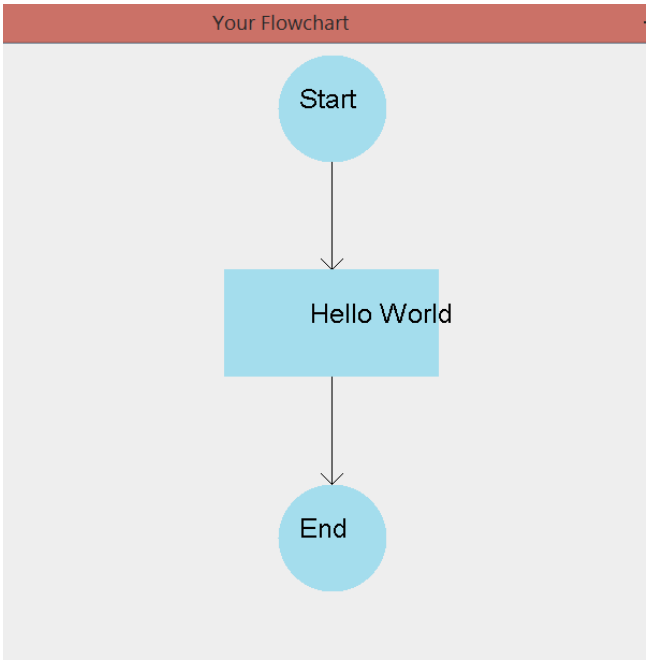

Fig.3: Output flowchart of Hello World code.

This ends the first part of the tutorial, next part will indicate the use of if in Flow++.

Using If

An important part of flowcharts are if's. The code to be used is this one:

Code 2: If code

```
Genesis(Ran)
a='x==0'
b='x<0'
c='o=0'
d='p=0'
e='u=0'
InsertIf(a,Start,c,b)
Insert(c,a,End)
InsertIf(b,a,d,e)
Insert(d,b,End)
Insert(e,b,End)
ShowItToMe(Ran)
```

In this code we will have two if. The **InsertIf** command accepts four (4) parameters, the first one is the value of the current node, the next one is the previous node, the third one is the node in the case that the condition is true, or yes, the last node is if the condition is false, or no.

Save the code, and run it. The output should be the one presented in **Fig. 4**. The flowchart might be bigger than the window; the window can be expanded or scrolled as needed to have a better view of the flowchart.

Now let's inspect what the command **InsertIf(a,Start,c,b)** did. Variable **a** has the value **'x==0',** this node has a diamond shape in the flowchart, this is the shape typically used for decisions/conditions in flowcharts. For the case the condition is true, or yes, you can see that '**x==0'** points to **c**, which has the value **'o=0',** and when the condition is false, or no, it points to **b**, whose value is **'x<0'**.

Warning: Loops in Flow++ are possible and when using if it is likely that a loop is used until a desired condition is met, but **be careful** too many loops in the flowchart can cause the compiler to crash, it is still being developed to handle this better.

This ends the second part of this tutorial, in the following part the final two commands, **Smash** and **GetOverHere**, will be explained.

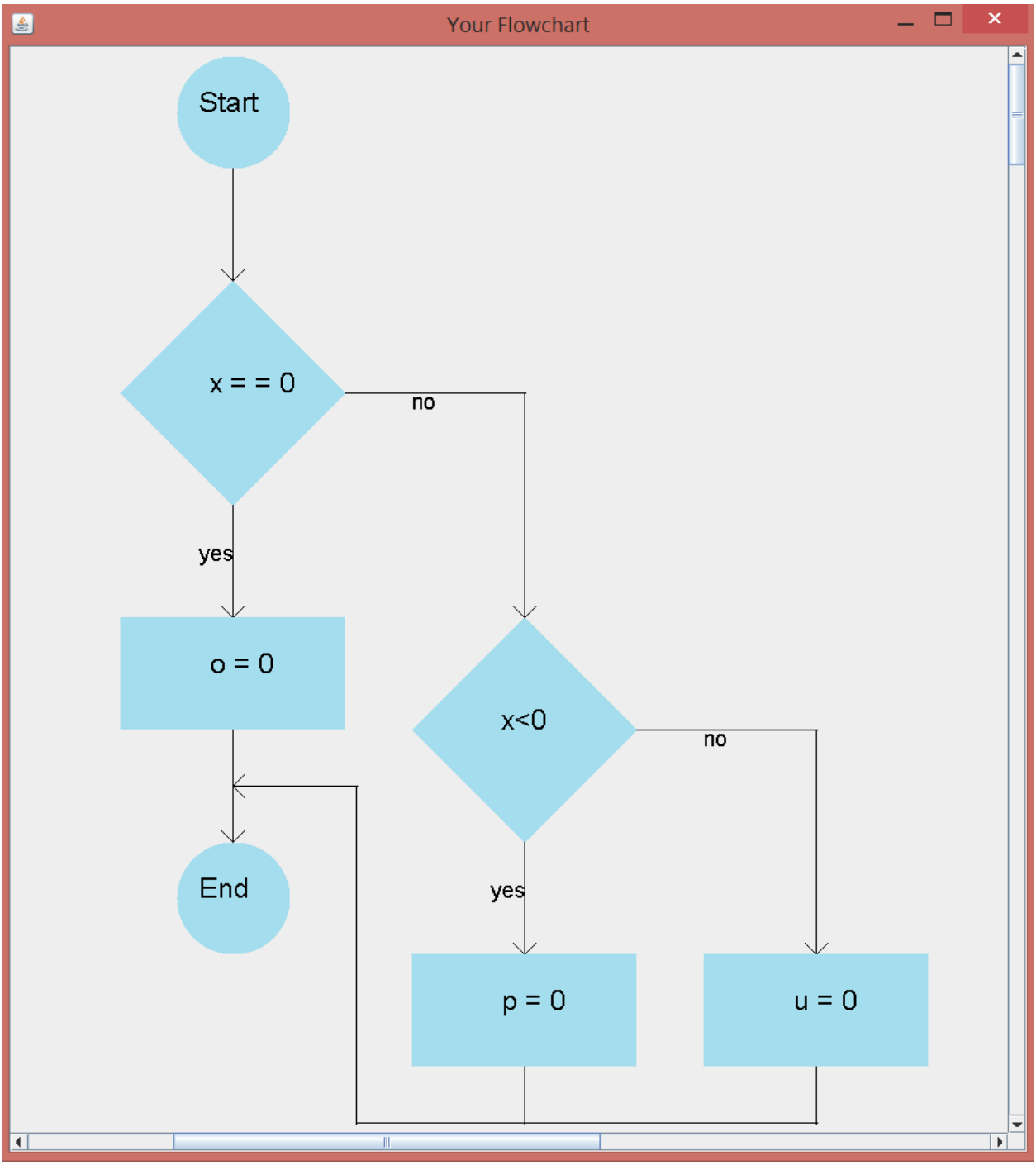

Fig. 4: Flowchart with two if

Smash and GetOverHere

Now let's use the other two remaining commands **Smash** and **GetOverHere**, these two can be used to change existing nodes in the flowchart. Write the code provided in **Code 3**, save and run it. The output should be what appears in **Fig. 5**. In the figure you should notice that it is a sequence of nodes that go from **a** to **d**.

Code 3: Smash and Get Over Here

```
Genesis(SGoH)
a='a'
b='b'
c='c'
d='d'
Insert(a, Start,b)
Insert(b,a,c)
Insert(c,b,d)
Insert(d,c,End)
ShowItToMe(SGoH)
```

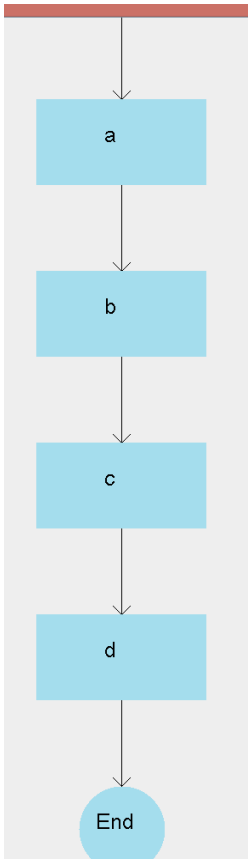

Fig. 5: Output of code 3

Now let's add the following 4 commands right before the **ShowItToMe** command. The code in the editor should look like the one in **Code 5**.

Code 4

```
Smash(a)
GetOverHere(c,b)
GetOverHere(b,End)
GetOverHere(Start,c)
```

These commands will do the following:

Smash will eliminate the node from the flowchart completely and **GetOverHere** will change the node that goes after the current one. With the command **Smash(a)** the node **a** will not appear in the flowchart unless inserted again later. The next three commands change the order of the flowchart so that **c** goes before **b**. The output of **Code 5** appears in **Figure 6**.

Code 5: Smash and Get Over Here updated

```
Genesis(SGoH)
a='a'
b='b'
c='c'
d='d'
Insert(a, Start,b)
Insert(b,a,c)
Insert(c,b,d)
Insert(d,c,End)
Smash(a)
GetOverHere(c,b)
GetOverHere(b,End)
GetOverHere(Start,c)
ShowItToMe(SGoH)
```

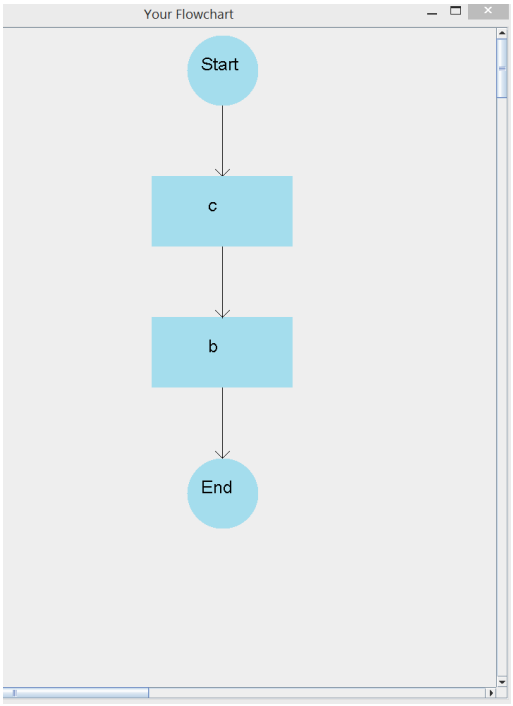

Fig. 6: Output of code 5

As you can see from **Fig. 6**, **a** is nowhere to be found and the order of the flowchart has changed. **Start** now points to **c**, **c** points to **b**, and **b** points to **End**. The command **GetOverHere(c,b)** changes node **c** so that the node after it is **b**, **GetOverHere(Start,c)** changes the next node **Start** to **c**, and so on.

Also you might have noticed that node **d** does not appear, this is due to the fact that when we changed the order nothing is pointing to **d.** To confirm this the console should be showing the error message shown in **Fig. 7**. This message indicates that the node exists but nothing in the flowchart referenced it.

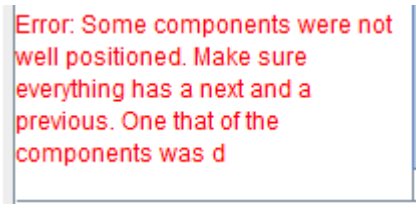

Fig. 7: Error message

This concludes the tutorial of Flow++.