6 First network project – Simple Chat

We already know:

- how to connect two or several computers from running Imagine environments either locally or through the real Internet,
- how to make use of the `net` object and its procedures to communicate. We already did this both from the command line and also with the help of a turtle which printed received messages dirctly into the page. To make this happen, we used the `onReceive` event of the `net` object.

Now we will connect several computers through the network and step by step build a simple, yet attractive Imagine project – simple chat application. In the same way as before, one of the computers (players) will innitiate the connection by creating the empty `Net` object in the command line:

- `new "Net []`

Then he/she will open the **Change net1** dialogue box and take the following steps:

- in the `Style` area check the `Server` option,
- then specify the `nickname`, for example `Marta`, and
- click the `Connect` button.

From lesson 4 we know that other player can joint the connection only if he/she knows either the **IP address** of the first player or the **name of his/her computer**. Let the actual IP number of `Marta`'s computer be `192.168.89.5` (a fictional example, of course). From lesson 5 we know now that there can be several players (in the same room or elsewhere) who may enter the connection in this way.

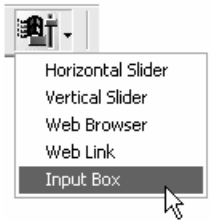
A player to join the connection will type in the command line: `new "Net []`, then	- he/she will open the **Change net1** dialogue box, - in the `Style` area check the `Client` option, - specify the `nickname`, for example `Peter`, - specify the "address" of the player who opened the connection, for example the IP number `192.168.89.5`, - click the `Connect` button.
Next player to join the connection will type in the command line: `new "Net []`, then	- he/she will take exactly the same steps. Let the `nickname` be `Zuzka`, - finally will click the `Connect` button.

... etc. for more players. On the **Basics** tab of the **Change net1** dialogue box, each player will specify the `onReceive` event as `print message`.

Comment: If two or more players specify identical name as their `nickname`, like `Peter` and `Peter`, Imagine will add a number suffix to make them different – like `Peter` and `Peter1`.

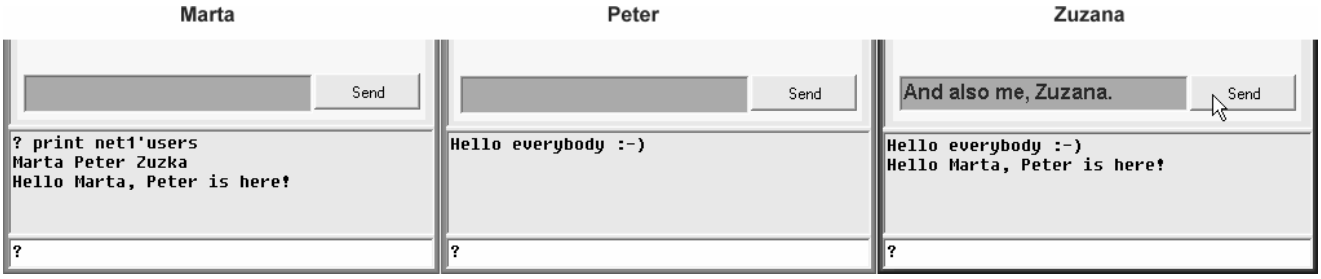
After having clicked the `Connect` button, you can immediately see on the first tab of the dialogue box whether your net object is connected or not. On the second tab you also see the actual list of all players currently connected. However, you may close the dialogue box and check the same info in the command line by typing in `print net1'connected?` or `print net1'users` (we will need this possibility later for programming more complex applications):

In the figure above we see that our connection currently consists of three players: `Marta`, `Peter` and `Zuzka`. They can now start the communication from their command lines typing commands like `net1'send <to_whom> <what>`. However, let us proceed in another way. Each player should click the `New Gadget` tool of the `Main Bar`, in the drop down menu choose the `Input Box` option and create a new input box at the bottom of the page (note that the input box's name will be `text1`).



Then open the **Change text1** dialogue box and set the background colour, the font and the font colour. Next to the input box create a button, open the **Change b1** dialogue box, set the caption to `Send` and specify the `onPush` event as `net1'send [] text1 text1'setValue "`.

First of these commands makes `net1` send to all other participants of the connection the actual contents (i.e. value) of the `text1` input box. Second command then clears the contents of `text1` by setting its value to the empty word. From now on, we will use the `text1` input box and the `Send` button for typing in and sending the messages – instead of the command line.



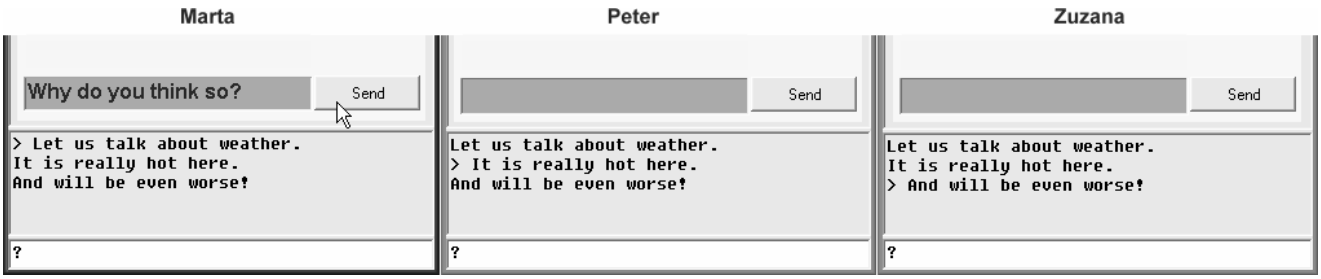
First player – `Marta` – has already typed into her input box the sentence `Hello everybody :-)` and clicked the `Send` button. Therefore you can see this sentence in the text screens of `Peter` and `Zuzana` as received messages. `Peter` then typed in `Hello Marta, Peter is here!` and sent it by the `Send` button. `Zuzana` is going to send her message now.

- **First improvement:** We want the `Send` button to do three things when clicked: (a) send the actual contents of `text1`, (b) print this message into my own text screen as well and finally (c) clear `text1`. To do so, each player should replace the `onPush` event of the `Send` button to:

  `net1'send [] text1 print text1 text1'setValue "`

- **Next improvement:** We want to see a special symbol, for example >, in front of my own messages, so that I can easily distinguish them from received messages. To do so, each player should change the `onPush` event of the `Send` button to:

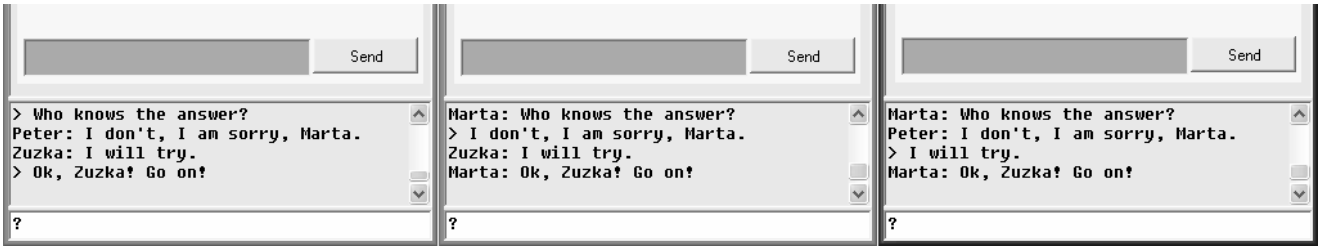
  `net1'send [] text1 print se "> text1 text1'setValue "`



§ **Next improvement:** We want to see the **name of the sender** of each received message to appear in my text screen in front of each message. To do so, we have to modify the `onReceive` event of `net1` from simple `print message` to:

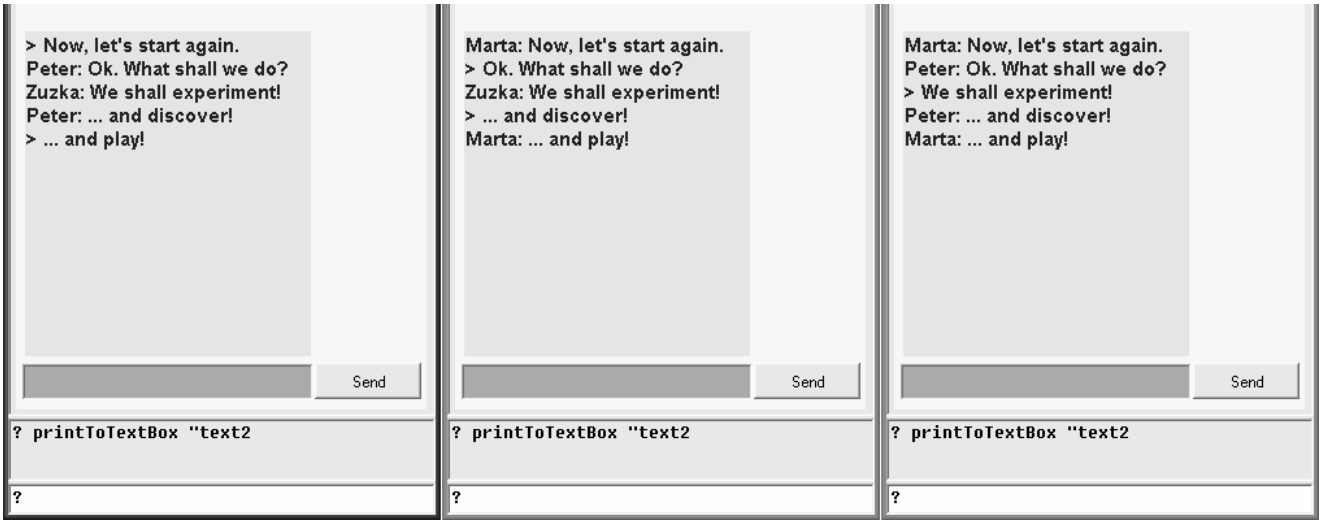
```
print se word sender ": message
```

Note that the result of the `sender` operation is the name of that participant who sent the message.



§ **Next improvement:** We have already eliminated the command line as the place for typing in our own messages. Now we want to eliminate the text screen as the place for printing out received (and my own) messages. To do so, each player should use the `New Text Box` tool of the Main Bar and create another text box above `text1` – its name will be `text2`. Open its **Change text2** dialogue box. Set the background colour, the font and font colour. Also, clear the `Grow With Value` check box (so that the text box keeps its size even if it is full of text). Clear the `Editing` check box (so that the text box won't be in the editing mode). Then clik the `Ok` button.

Now we have to redirect the `print` command into the `text2` text box (instead of printing into the text screen). We do this by typing the `printToTextBox "text2` command into the command line.



Conclusion

We have built a simple visual interface above the net application which makes it possible to connect to a chat and send/receive messages typed into the text boxes. This simple application illustrates how easily all technical details of working with the net object can be (nearly) hidden.

Possible further extensions and improvements

§ Add a button next to text box `text2`, which will clear its contents.

§ As a parallel alternative to the Send button (its name is b1) you may specify a **key menu** for the text1 input text box. It will react to the Enter key in the same way as if you push the Send button b1:

```
text1'setKeyMenu [Enter [b1]]
```

§ (more advanced) So far each participant of our chat has always sent each message to all other participants. However, from Lesson 5 we already know this is not necessary. Add another text box (its name will be text3), in which you can specify the addressees (their nicknames) for your message, see figure below. If you leave the text box empty, it should correspond to the empty list in `net1'send []` […]. If you type in for example Peter, it should correspond to the list with one addressee: `net1'send [Peter]` […]. If you type in more nicknames, for example Peter the list of addressees should contain exactly these participants. To get such format of the contents of the text3 text box, use the expression `parse text3` to transform its contents (which is always one long word only) into a list of its items. Modify the Send button so that it sends the message only to those participants that are listed in text3.