

### 8.3.2.6. Saltim

**Number of students:** 3

**Students' processing mode:**

- Student 1 : Low Serial -0.04847  
High Parallel 0.23527
- Student 2 : High Serial 0.81924      7th highest serial processing.  
Low Parallel -0.54956
- Student 3 : Low Serial -0.89323  
High Parallel 1.45204      Highest parallel processor.

**Percentage of tasks solved on the first attempt:** 70%

**Common Errors:**

- Misspelt commands. (4 times)
- Forgetting the space between a command and a number such as FORWARD50. (7 times)
- Forgetting to give a number with a command such as RIGHT (4 times)
- Gave the command BACKWARD instead of BACK.

**Observations:**

- When left to their own devices, "Saltim" experimented with using procedures inside commands such as FORWARD proname. They also liked to change colour with every line when drawing a shape.
- One question was not solved until their third attempt, and they asked for help on a regular basis.

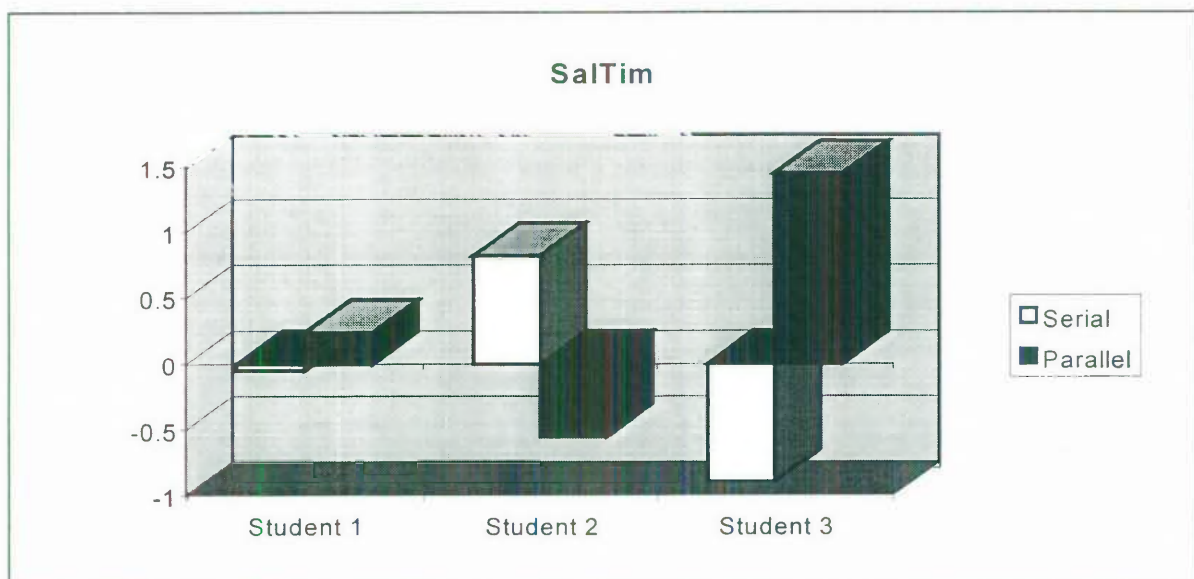


Figure 8.6 : Group Six ('Saltim')

### 8.3.2.7. Joeys

**Number of students:** 2

**Students' processing mode:**

- Student 1 : High Serial 0.50448  
                   High Parallel 0.17748      9th highest serial processor
- Student 2 : Low Serial -0.90137  
                   High Parallel 0.65258      6th highest parallel processor

**Percentage of tasks solved on the first attempt:** 70%

**Common Errors:**

- Split the command CLEARSCREEN into clear and screen.
- When given the task of drawing a square, this group drew a rectangle.

**Observations:**

- During free exploration, this group would select a colour, draw a shape or pattern, clear the screen and start again (in much the same way as the 3 Stooges group). The two groups were next to one another in the computer room. They also experimented with large numbers in using REPEAT.
- "Joeys" solved all problems in their first or second attempt, and only asked for help when they found themselves in difficulties.

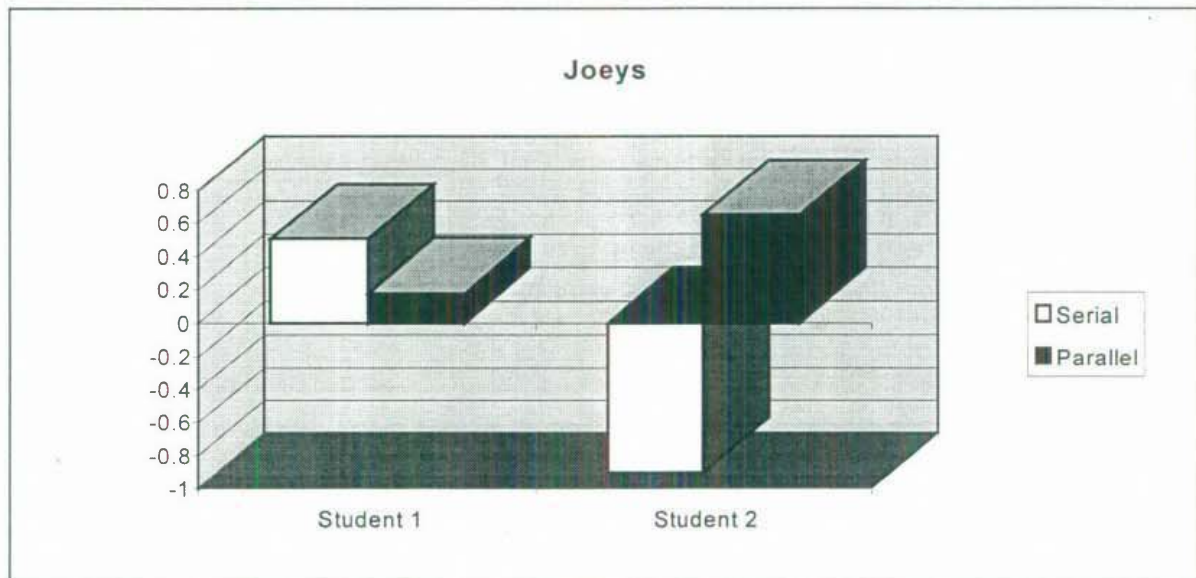


Figure 8.7 : Group Seven ('Joeys')

### 8.3.2.8. Extras

Number of students: 3

#### Students' processing mode:

- Student 1 : Low Serial -1.11994  
High Parallel 0.26384
- Student 2 : High Serial 0.22872  
Low Parallel -3.43335
- Student 3 : High Serial 0.65847      8th in serial processing.  
High Parallel 0.50664      8th in parallel processing

Percentage of tasks solved on the first attempt: 70%

#### Common Errors:

- Did not draw a square properly as they missed one condition of the task namely to finish up pointing the same way as they started out.
- Did not complete a task successfully as they did not make use of the REPEAT command when asked, and they drew one line too long.

#### Observations:

- All the errors made by this group related back to not reading or interpreting the tasks set.
- "Extras" asked for help on a regular basis - even during free exploration. In free exploration time they did not attempt anything new but repeated the simple tasks that they had learned earlier.
- One lesson took 3 attempts before the group answered the set task correctly.

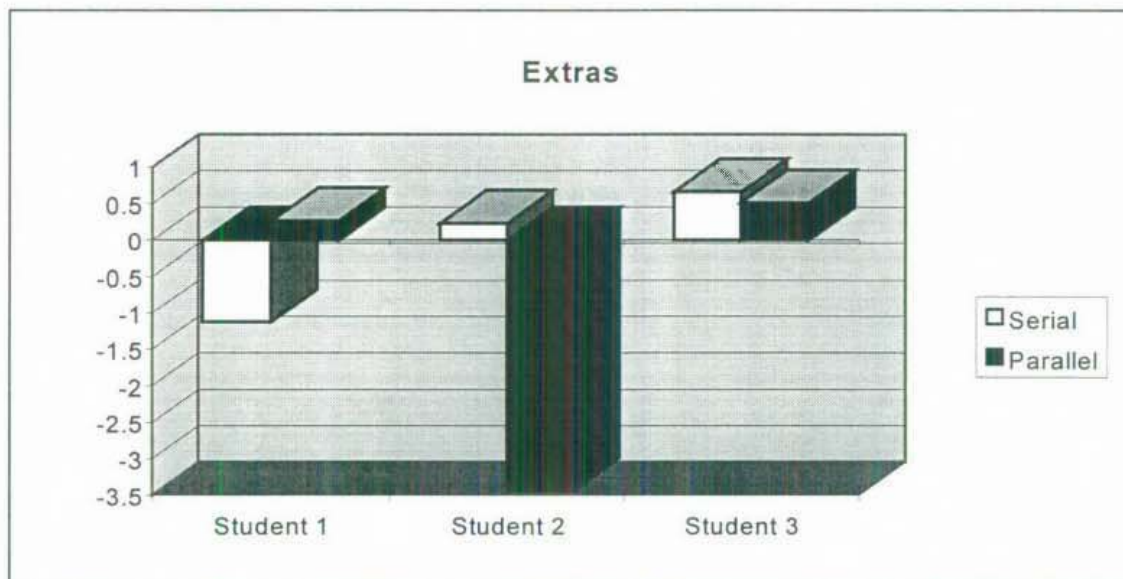


Figure 8.8 : Group Eight ('Extras')

### 8.3.2.9. GSK Gang

Number of students: 3

**Students' processing mode:**

- Student 1 : High Serial 0.85250      6th in serial processing  
    High Parallel 0.90564      4th in parallel processing
- Student 2 : Low Serial -0.81608
- Low Parallel -0.38958
- Student 3 : Low Serial -1.11099
- Low Parallel -0.12939

Percentage of tasks solved on the first attempt: 60%

**Common Errors:**

- Forgetting the space between a command and a number such as FORWARD50. (3 times)
- Forgetting to give a number with a command such as RIGHT. (3 times)
- Typed in clear instead of the command CLEARSCREEN.
- Incorrectly added a number to the commands UP and DOWN.
- Gave the command BACKWARD instead of BACK.
- Had a tendency to put commands in twice.
- Typed in REPEAT command and number of times the instructions had to be repeated but omitted the instructions themselves. (4 times)
- Forgetting to go forward in a REPEAT command. (e.g., REPEAT 3 RIGHT 120). (2 times)

**Observations:**

- This group did not appear to have any particular aim during free exploration but were content to "zigzag" across the screen changing the colours of the lines every so often. At one stage the group did experiment with the REPEAT command. All tasks were completed successfully on the first or second try, and the group asked for help on a regular basis.

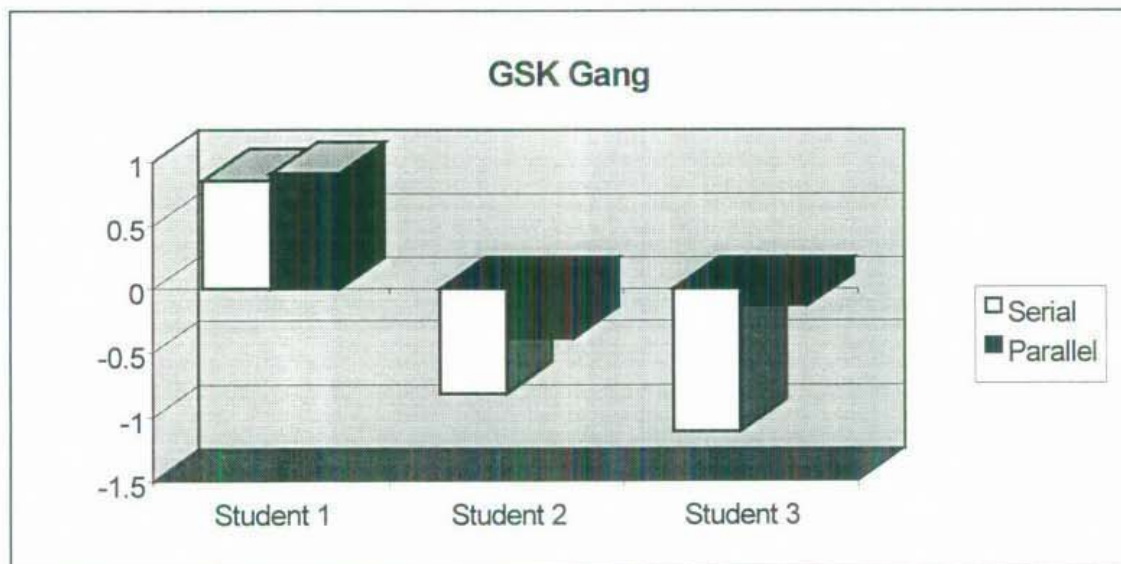


Figure 8.9 : Group Nine ('Gskgang')

### 8.3.2.10. Awesome Foursome

**Number of students:** 2

**Students' processing mode:**

- Student 1 : Low Serial -0.16027  
Low Parallel -2.02021
- Student 2 : Low Serial -1.78682  
Low Parallel -0.11799

**Percentage of tasks solved on the first attempt:** 40%

**Common Errors:**

- Misspelt commands. (*3 times*)
- Forgetting the space between a command and a number such as FORWARD50. (*3 times*)
- Did not make use of the REPEAT command when given the repeat task.
- When drawing a rectangle, used the command REPEAT 4 instead of REPEAT 2.
- One reason for the group's low score was that they did not finish tasks in the time allocated.

**Observations:**

- This group asked for help in the initial lessons but stopped with the later lessons. All questions were answered correctly the first or second time.
- "Awesome Foursome" were given help by the teacher during their free exploration sessions and this was reflected in their work. They created a procedure, drew a circle, and drew a variety of shapes using the REPEAT command.

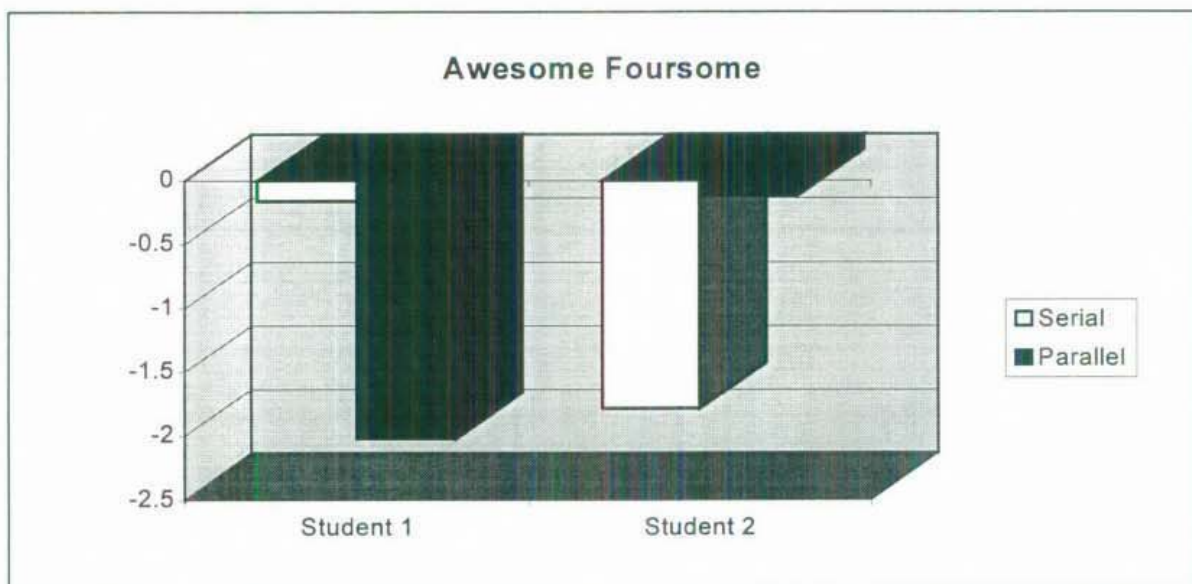


Figure 8.10 : Group Ten ('Awesome Foursome')

## 8.4. Conclusion

The previous observations give an indication of the type of data that can be collected by the system. Given the small number of students involved, and considering that the students did not work at the computer on an individual basis, it would not be prudent to draw definite conclusions. However, it is interesting to note the following:

- Groups that did well with the computer programs had one student that scored highly in both the serial and parallel processing categories in comparison with the other students in the group, and that particular student also scored very well in one of the categories. These groups were "Heroes 3", "Dancing Fingers" and "Yankees";
- Some groups that did moderately well with the computer programs, had one student that was dominant within the group in both serial and parallel processing categories, but that student had average scores in these categories. These groups were "3 Stooges", "Joeys" and "Extras"; and
- Other groups that did moderately well with the computer programs, had one student that scored particularly highly in one category, but another student who was better in the other category. These groups were "Fire Bros" and "Saltim".

The exception was in the case of Group 9 ("Gskgang"). This group had one student who scored highly in both categories, and two students who had low scores in both categories. However, the student who scored highly was a reserved student. Another consideration is that the two students with low scores were not present at every session - begging the question "Do students that score highly in one type of processing work better with others than alone?" This would be an interesting alternative study. For the purposes of this Case Study the results from this group will not be accurate.

Groups that contained students with low parallel processing tended to have problems with the following types of tasks:

- the REPEAT command; and
- drawing the correct shape (i.e., picturing a shape).

Groups that contained students with low serial processing had difficulty remembering the correct commands. Such students are non-planners, are readily distracted, and more likely to change their goal.

In general, it was observed that:

- Students were quick to notice that the command FORWARD 100 was equal to entering the command FORWARD 50 twice;
- When drawing a square it was not unusual for the student to use a mixture of FORWARD and BACK commands;
- The students noticed that the arrow's direction changed after the BACK command was issued;
- The students enjoyed being able to change screen colour;
- When the task was changed from drawing a square to drawing a triangle, some students continued to draw an angle of 90 degrees;
- Quite a number of students would forget to include the angles for a shape when using the REPEAT command;
- Most students found the concepts of WRAP and FENCE difficult to understand.

- Some students had a tendency to forget the space between a command and the number following it;
- The students would give numbers with commands such as RUBBER, WRAP and FENCE;
- The students found it confusing to use the UP and DOWN commands together, and then use the RUBBER and DOWN commands together. (A solution would be to add an extra command such as DRAW to be the opposite of RUBBER); and
- The students discovered how to use the system to draw circles.

The limitations of this study were:

- the small number of students involved in the study; and
- the lack of opportunity for the students to use the computer programs on an individual basis.