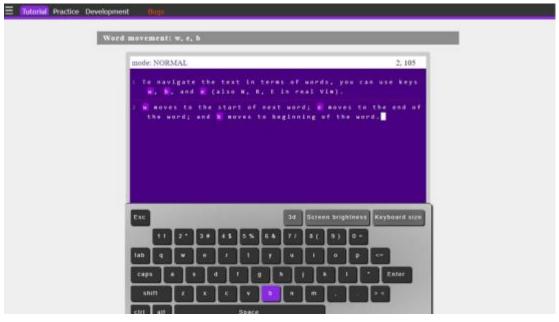
LAB#2

Activity 1: The vim Text Editor



The Electronic Telegraph Thursday 28 September 1995 Science

This summer the Royal Observatory at Herstmonceux found new life as a science centre. Andro Linklater celebrates a partial victory for the heritage

THE SIGHT of a child's top spinning unsupported in mid-air should have been surprising. Rotating there in space, it not only defied the rules of gravity, it defied common sense, and at least three Fellows of the Royal Society gazed at it in something close to wonder.

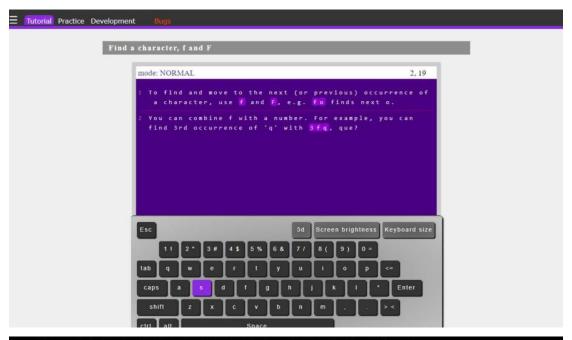
But this was Fabricators' Week at the Herstmonceux Science Centre, with exhibitors from science centres all over Europe arriving to demonstrate prototypes of experiments they hoped to produce as hands-on displays - a tube of rocket-propelled rubber balls, a solar-powered toy car, a model of planetary movement. They had a much tougher audience in mind. Would it astonish a child?

"Well I certainly found it surprising," Prof Michael Berry FRS, an expert in gravitational physics and the top's demonstrator, said a trifle indignantly. "The physics of why the top doesn't topple over are extraordinarily complex, and so far as I know, no one has ever demonstrated the experiment before."

So challenging are the physics indeed that Berry has written a paper on the spinning top, invented by Bill Hones of Seattle, for the scientific journal Nature. Its position in mid-air was maintained by the straightforward method of positioning a magnet beneath it with reverse polarity, but its stability was acquired in far more complicated fashion, through the interaction of the magnetic field and the forces created by its spin. In technical terms, it had become an adiabatic trap.

"A child brought up on cinema special effects might think it quite normal to have a top spinning in space"

But Prof Richard Gregory, another FRS and emeritus professor of Neuro-Psychology at Bristol University, was not convinced that this was enough



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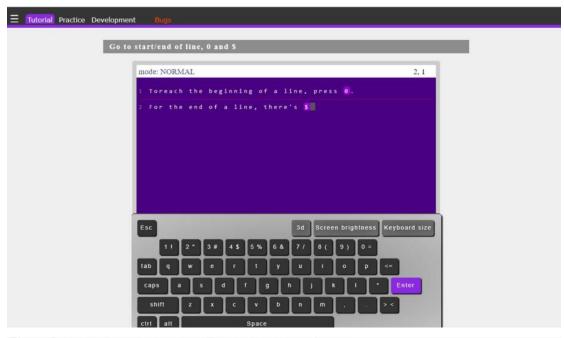
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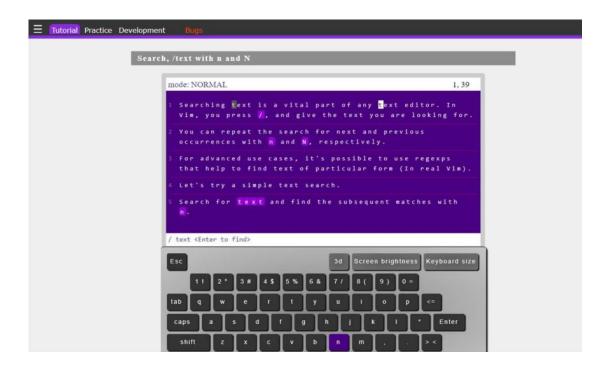
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the Exploratory, Britain's first hands-on science centre housed in Temple Meads station in Bristol. All the exhibits, demonstrating phenomena as diverse as the electrical effects of lightning and the length of sound waves, were designed to be operated by children.

"The point about a science centre is that the exhibits should be fun," he said.
"By which I don't mean frivolous but interesting. They should trigger some
response in the child's mind - what I call a 'cortickle'."

This taste for deplorable puns belies Gregory's standing as a scientist whose work on lunar photography, for example, made possible the successful docking and landing of Nasa's Moon mission, but it is crucial to his achievement in making science enjoyable. Both the Exploratory, which attracts 150,000 visitors a year, and other centres inspired by its success, such as Birmingham's "Light on Science" exhibition, all betray the same puckish outlook.

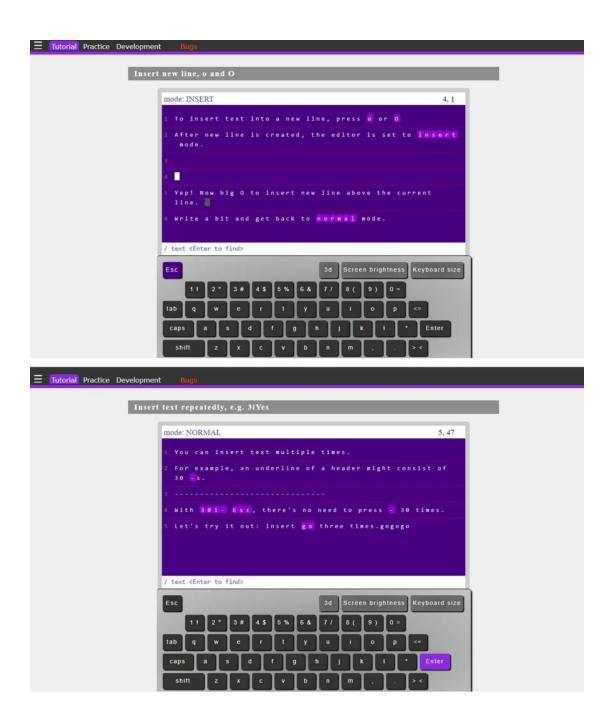
Herstmonceux, which opened in April this year, represents his most ambitious attempt at cortex tickling. This time he aims not only to make science entertaining but to rescue an irreplaceable part of Britain's scientific heritage.

Much more challenging is the attempt to rescue a piece of scientific heritage

To judge by the response of both children and adults absorbed in working the exhibits already in place, ranging from an Archimedes screw lifting water to light-sensitive acoustic chimes, its success as a science centre is not in question.

"Doesn't it make you feel sick?" demanded eight-year-old Robin Montgomery enthusiastically as he gave instructions on how to use an experiment in optical illusions. "When you look away you should see the floor rise up, and feel yourself going bleeargh."

Whether or not that was precisely the illusion intended by the centre's director, Steve Pizzey, whose Science Projects company devised the exhibits, ?Science

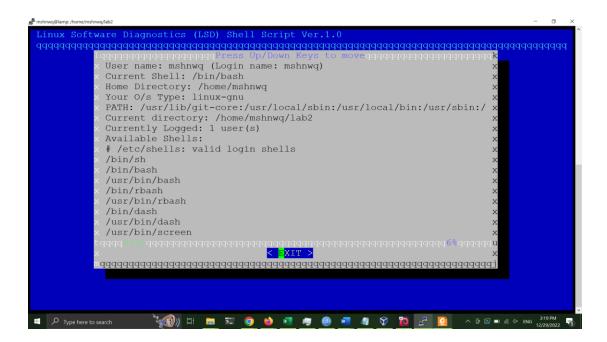


Activity 2

```
mshnwq@lamp: /home/mshnwq
mshnwq@lamp ~$ bash work.sh
test.sh
         work.sh
Hello
total 8
-rw-r--r- 1 mshnwq mshnwq 21 Dec 22 06:59 test.sh
-rw-r--r-- 1 mshnwq mshnwq 274 Dec 22 07:05 work.sh
mshnwq@lamp ~$
mshnwq@lamp ~$ ls -1
total 8
-rw-r--r-- 1 mshnwq mshnwq 21 Dec 22 06:59 test.sh
-rw-r--r-- 1 mshnwq mshnwq 274 Dec 22 07:05 work.sh
mshnwq@lamp ~$ chmod u+x work.sh
mshnwq@lamp ~$ ls -1
total 8
-rw-r--r- 1 mshnwq mshnwq 21 Dec 22 06:59 test.sh
-rwxr--r-- 1 mshnwq mshnwq 274 Dec 22 07:05 work.sh
mshnwq@lamp ~$
mshnwq@lamp ~$ bash work.sh > result
mshnwq@lamp ~$ cat result
result
test.sh
work.sh
Hello
total 12
-rw-r--r-- 1 mshnwq mshnwq 29 Dec 22 07:09 result
-rw-r--r- 1 mshnwq mshnwq 21 Dec 22 06:59 test.sh
-rwxr--r-- 1 mshnwq mshnwq 274 Dec 22 07:05 work.sh
mshnwq@lamp ~$
mshnwg@lamp ~$ bash work.sh &
[1] 1563
mshnwq@lamp ~$ result test.sh work.sh
ps
  PID TTY
                    TIME CMD
 1160 pts/0 00:00:00 bash
1563 pts/0
1565 pts/0
1566 pts/0
               00:00:00 bash
               00:00:00 sleep
               00:00:00 ps
mshnwq@lamp ~$ Hello
total 12
-rw-r--r-- 1 mshnwq mshnwq 193 Dec 22 07:09 result
-rw-r--r-- 1 mshnwq mshnwq 21 Dec 22 06:59 test.sh
-rwxr--r-- 1 mshnwq mshnwq 274 Dec 22 07:05 work.sh
```

```
mshnwq@lamp ~$ gcc -o infinity infinty.c
mshnwq@lamp ~$ ls
infinity infinty.c result test.sh work.sh
mshnwq@lamp ~$ ./infinity
^C
mshnwq@lamp \sim$ ./infinity &
[1] 1658
mshnwq@lamp ~$ ps
 PID TTY
                   TIME CMD
1160 pts/0
               00:00:00 bash
1658 pts/0
               00:00:12 infinity
1659 pts/0
               00:00:00 ps
mshnwq@lamp ~$ ps
 PID TTY
                   TIME CMD
 1160 pts/0
               00:00:00 bash
 1658 pts/0
               00:00:27 infinity
1660 pts/0
               00:00:00 ps
mshnwq@lamp ~$ kill 1658
mshnwq@lamp ~$ ps
 PID TTY
                   TIME CMD
 1160 pts/0
               00:00:00 bash
1661 pts/0
               00:00:00 ps
                              ./infinity
[1]+ Terminated
```

Activity 3:



Activity 4:

```
mshnwq@lamp: /home/mshnwq
mshnwq@lamp ~$ vi sc2.sh
mshnwq@lamp ~$ bash sc2.sh
'*' is Required
/*
mshnwq@lamp ~$ bash sc2.sh '/bin/*'
/bin/*
Symbol is not Required
mshnwq@lamp ~$ bash sc2.sh '/bin'
'*' is Required
/bin/*
mshnwq@lamp ~$
mshnwq@lamp ~$ cat sc2.sh
#!/bin/sh
if echo "$1" | grep '*'
then
        echo "Symbol is not Required"
else
```

echo "'*' is Required"

echo ""\$1"/*"