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CSI-1420 “Intro to Unix & C Programming”

HW2 C Control Flow Structures

Edge Cases

Question 1, Problem 1:

The screenshot shows a terminal window in the VS Code interface. The terminal tab is active, displaying the following interaction:

```
Nov 3 22:07
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS
Enter the numerical grade (0-100):
a
Invalid grade. Please enter a grade between 0 and 100:
-1
Invalid grade. Please enter a grade between 0 and 100:
76
C
[1] + Done          "/usr/bin/gdb" --interpreter=mi --tty=${DbgTerm} 0<"/tmp/Microsoft-MIEngine-In-zypwzjaw.ddw" 1>"/tmp/Microsoft-MIEngine-Out-scan
4thz.s0l"
↳jay@jay-VirtualBox:~/homework/HW2$
```

The terminal shows two invalid inputs ('a' and '-1') followed by a valid input ('76'). The output indicates the program is using GDB for debugging.

Question 1, Problem 2:

A screenshot of a terminal window titled "HW2". The terminal shows the following interaction:

```
Select an operation:  
[ + - * / % ^ ]  
a  
Invalid input. Please select an operation:  
[ + - * / % ^ ]  
1  
Invalid input. Please select an operation:  
[ + - * / % ^ ]  
+  
Enter your first number:  
a  
Invalid input. Enter your first number:  
2  
Enter your second number:  
b  
Invalid Input. Enter your second number:  
.3  
2.00 + -3.00 = -1.00  
Continue Calculator? (y/n)  
n  
Thank you for using the calculator!  
[1] + Done  
"/usr/bin/gdb" --interpreter=mi -tty=${DbgTerm} 0</tmp/Microsoft-MIEngine-In-wmbukled.tll" 1>/tmp/Microsoft-MIEngine-Out-1zds  
0tkw.5ub"  
↳ jay@jay-VirtualBox:~/homework/HW2$
```

Question 2, Problem 1:

A screenshot of a terminal window titled "HW2". The terminal shows the following interaction:

```
Enter a number to look for primes from 1 to n:  
a  
Invalid Input. Enter an integer to look for primes from 1 to n:  
1  
Invalid Input. Enter an integer to look for primes from 1 to n:  
100  
| 2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 |  
| 31 | 37 | 41 | 43 | 47 | 53 | 59 | 61 | 67 | 71 |  
| 73 | 79 | 83 | 89 | 97 |  
-----  
Number of primes found: 25  
Time elapsed: 0.000038  
[1] + Done  
"/usr/bin/gdb" --interpreter=mi -tty=${DbgTerm} 0</tmp/Microsoft-MIEngine-In-tvemjouk.52" 1>/tmp/Microsoft-MIEngine-Out-b4ds  
04p3.zhr"  
↳ jay@jay-VirtualBox:~/homework/HW2$
```

Question 2, Problem 2:

The terminal window shows a user interacting with a program to generate patterns. The user types 'd' and receives an error message: 'Invalid input. Please select a pattern to generate:'. The user then types 'b' and receives a series of numbers representing a pattern: '1', '121', '12321', '1234321', '123454321', '12345654321', and '[1] + Done'. The command used is '/usr/bin/gdb'.

```
Select a pattern to generate:  
A) Diamond      B) Number Pyramid  
d  
Invalid input. Please select a pattern to generate:  
A) Diamond      B) Number Pyramid  
1  
Invalid input. Please select a pattern to generate:  
A) Diamond      B) Number Pyramid  
b  
1  
121  
12321  
1234321  
123454321  
12345654321  
[1] + Done          "/usr/bin/gdb" --interpreter=mi --tty=${DbgTerm} 0<"/tmp/Microsoft-MIEngine-In-0rbzk4mg.52q" 1>/tmp/Microsoft-MIEngine-Out-kfaq  
d2nd.x08"  
↳ jay@jay-VirtualBox:~/homework/HW2$
```

Question 2, Problem 3:

The terminal window shows a user interacting with a program to calculate Fibonacci numbers and golden ratio approximations. The user enters '100' and receives the sum of even Fibonacci numbers below 100: '188'. The user then enters '13' and receives the golden ratio approximation: '1.618034'. The command used is '/usr/bin/gdb'.

```
The first 10 Fibonacci Numbers are:  
0 1 1 2 3 5 8 13 21 34  
Enter a number to compute the sum of even Fibonacci numbers below it.  
limit = a  
Invalid Input  
Number must be an integer.  
n = -1  
Invalid Input  
Number must be an integer.  
n = 100  
The sum of even Fibonacci Numbers below 100 is:  
188  
Enter a number to determine if it is in the Fibonacci sequence.  
n = 13  
Invalid Input  
Number must be an integer.  
n = -1  
Invalid Input  
Number must be an integer.  
n = 13  
13 IS in the Fibonacci sequence  
The Golden Ratio approximation will now be displayed:  
F[2] = 1, F[1] = 1, ratio = 1.000000  
F[3] = 2, F[2] = 1, ratio = 1.500000  
F[4] = 3, F[3] = 2, ratio = 1.500000  
F[5] = 5, F[4] = 3, ratio = 1.666667  
F[6] = 8, F[5] = 5, ratio = 1.600000  
F[7] = 13, F[6] = 8, ratio = 1.625000  
F[8] = 21, F[7] = 13, ratio = 1.615385  
F[9] = 34, F[8] = 21, ratio = 1.619048  
F[10] = 55, F[9] = 34, ratio = 1.617647  
F[11] = 89, F[10] = 55, ratio = 1.618182  
F[12] = 144, F[11] = 89, ratio = 1.618078  
F[13] = 233, F[12] = 144, ratio = 1.618056  
F[14] = 377, F[13] = 233, ratio = 1.618026  
F[15] = 610, F[14] = 377, ratio = 1.618037  
F[16] = 987, F[15] = 610, ratio = 1.618033  
F[17] = 1597, F[16] = 987, ratio = 1.618034  
F[18] = 2584, F[17] = 1597, ratio = 1.618034  
F[19] = 4181, F[18] = 2584, ratio = 1.618034  
F[20] = 6765, F[19] = 4181, ratio = 1.618034  
[1] + Done          "/usr/bin/gdb" --interpreter=mi --tty=${DbgTerm} 0<"/tmp/Microsoft-MIEngine-In-2yjb12hg.bvm" 1>/tmp/Microsoft-MIEngine-Out-ivqvvbk.vbz"  
↳ jay@jay-VirtualBox:~/homework/HW2$
```