I used Ida pro and gdb to solve the phases

Going throught the assembly code, I was able to see that on input the (1-5) five different phases are called, and on input 0 the program terminates.

After talking the input string, the program calls each phase.

Phase 1:

In phase one the input string and the string ‘Reverse engineering is fun!’ length is compared. If they are differernt the program calls ‘incorrect_input’ and prints ‘Incorrect input! Exiting’. Then exit is called, terminalting the program.

If the string length mathes then a sting compare is perfomed and if valid, the program prints ‘Phase solved! Nice work!’

solution: Reverse engineering is fun!

Phase 2:

In phase two the input given is convetered to an interger using atoi, so its a number. The number that is compared aganist the input is 0FFFFh which is equal to 65535

solution: 65535

Phase 3:

Since atoi is called on the input, the input must a number. 146 is moved into a register

eax = edx = input int
eax = eax + eax
eax = eax + edx
eax = eax + eax
eax = eax + 8

cmp eax == 146

solving this equation,

146 – 8
138 / 2
(69 – inp)/2 = inp

69-inp = 2inp

69 = 3inp

inp = 69/3 = 23

solution: 23

Phase 4:

The string length of the input string is found, If the string length is less than 5 the program exits. A loop is executed to check each charecter and runs for the length of the string.

Var1c = 1
For i to len(inp):
    eax = str[i] – 48
    if eax < 0:
        if (eax <= 9):
            if (eax == var1_c):
                var_1c ++;
                continue;

there the 0 < (char – 48) <=9 and (char -48) == 1

1 = 49
2 = 50
3 = 51 etc..

therefore the solution = 12345

solution: 12345

Phase 5:

Since atoi is called, the input should a number.
If input ==0 : exit

there are 4 consicutive values 3, 4, 7, and 11.

a loop runs 4 times:

```
arr[4] = {3, 4, 7, 11}
inp = atoi(inp)

for (i=0; i<4; ++i) {
    if (inp % arr[i] != 0)
        exit()
}
print (Phase solved! Nice work!)
```

check fot a number divisible by 3, 5, 7, 11

3*5*7*11 = 1155

solution: 1155