LAB SHEET - 3

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Q1)

q1.hs

```
double :: Int -> Int
double x=2*x
```

```
adhinene@sampat:~/ppl/lab3$ ghci
GHCi, version 8.8.4: https://www.haskell.org/ghc/  :? for help
Prelude> load q1.hs

<interactive>:1:1: error:
    Variable not in scope: load :: t0 -> b0 -> c

<interactive>:1:6: error: Variable not in scope: q1

<interactive>:1:9: error: Variable not in scope: hs :: a -> b0
Prelude> :load q1.hs
[1 of 1] Compiling Main             ( q1.hs, interpreted )
Ok, one module loaded.
*Main> double 22
44
*Main> double 54
108
```

Q2)

```haskell
successor :: Int -> Int
successor x=1+x
```

```
adhinene@sampat: ~/ppl/lab3
Prelude> :load q2.hs
[1 of 1] Compiling Main             ( q2.hs, interpreted )
Ok, one module loaded.
*Main> successor 32
33
*Main> successor 455
456
*Main>
```

Q3)

```haskell
checkeven :: Int -> Bool
checkeven n = if (mod n 2)==0 then True else False
```

```
adhinene@sampat: ~/ppl/lab3
Prelude> :load q3.hs
[1 of 1] Compiling Main             ( q3.hs, interpreted )
Ok, one module loaded.
*Main> checkeven 2
True
*Main> checkeven 2778
True
*Main> checkeven 2797
False
*Main>
```

Q4)

```haskell
checkeve :: Int -> String
checkeve n = if(mod n 2) == 0 then "even" else "odd"
```

```
adhinene@sampat: ~/ppl/lab3
*Main> :load
Ok, no modules loaded.
Prelude> :load q4.hs
[1 of 1] Compiling Main             ( q4.hs, interpreted )
Ok, one module loaded.
*Main> checkeve 24
"even"
*Main> checkeve 55
"odd"
*Main> checkeve 699
"odd"
*Main>
```

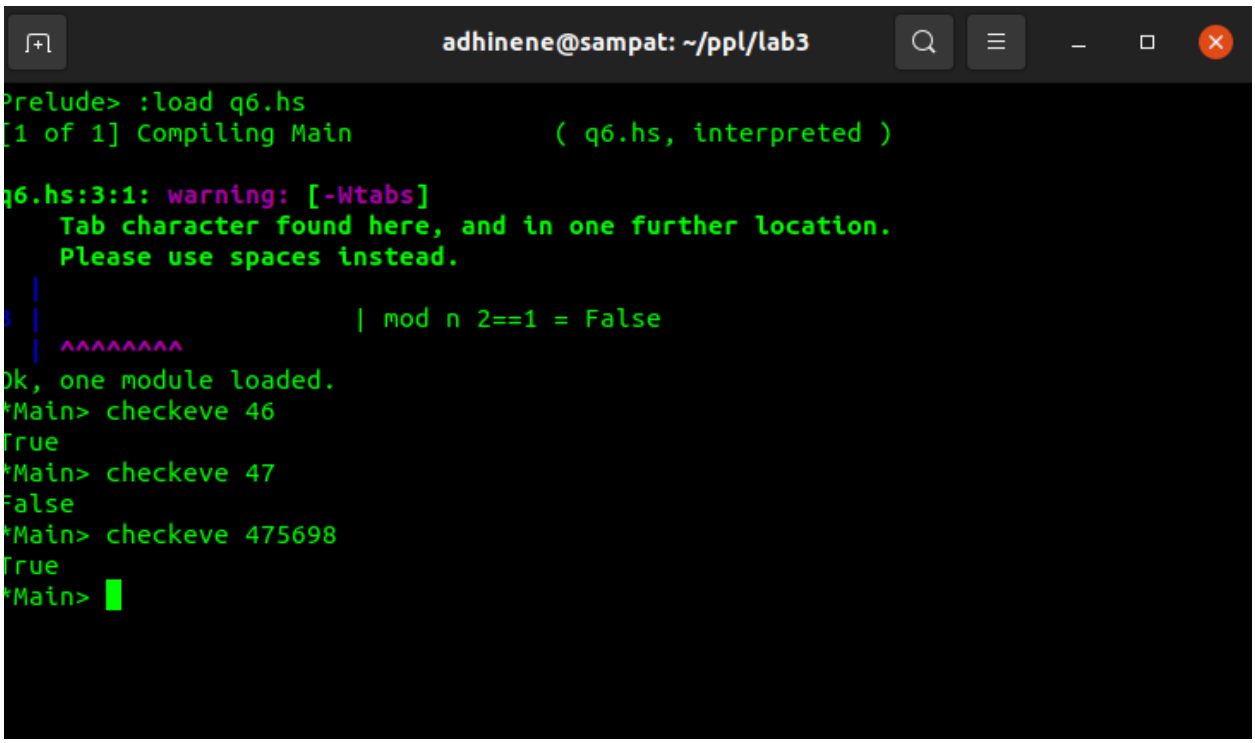
Q5)

```haskell
absolute :: Integer -> Integer
absolute n = if (n>=0) then n else negate n
```

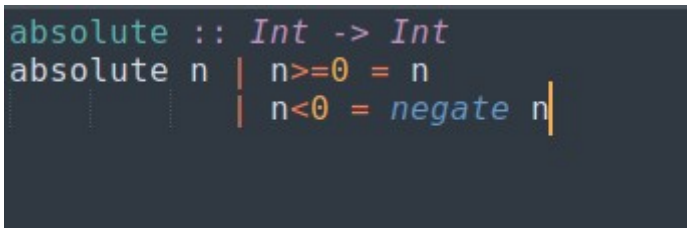
```
adhinene@sampat: ~/ppl/lab3
*Main> absolute 566
566
*Main> absolute (-566)
566
*Main>
```

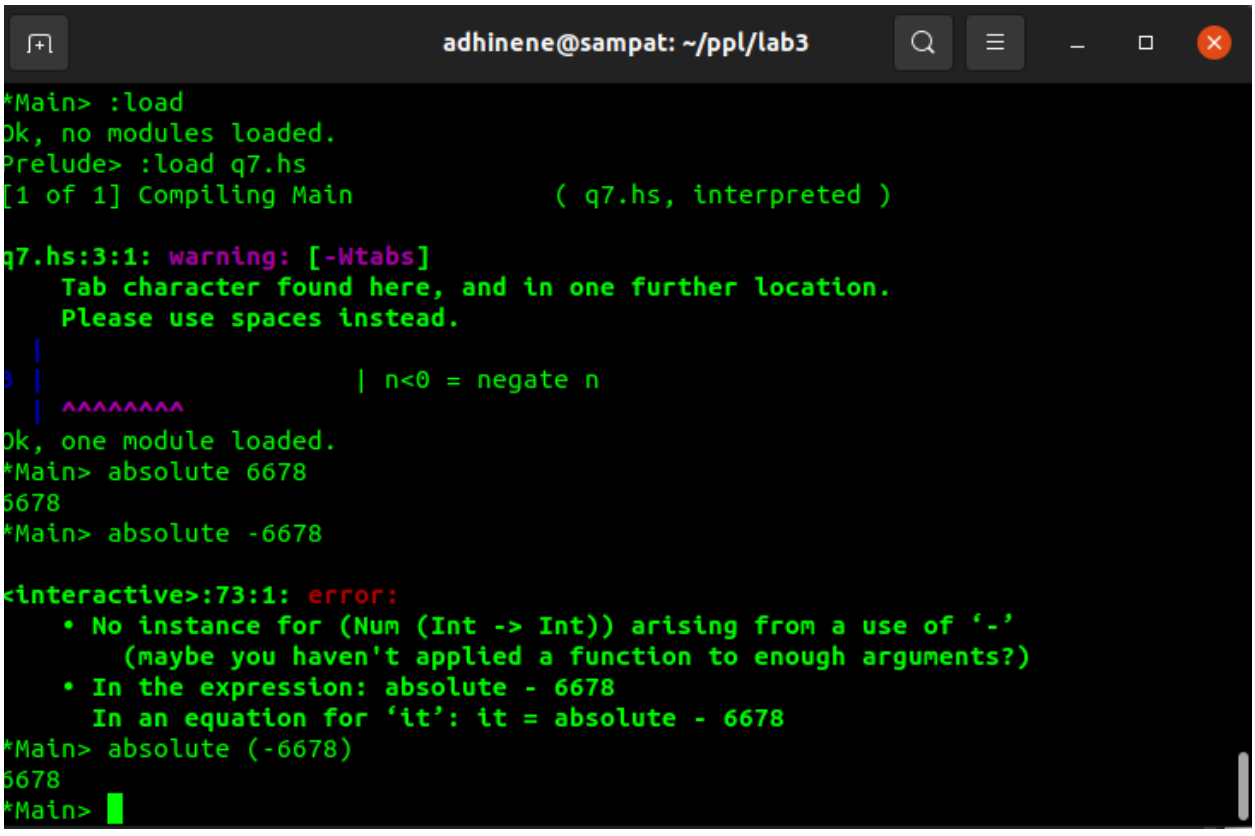
Q6)

```haskell
checkeve :: Int -> Bool
checkeve n | mod n 2==0 = True
           | mod n 2==1 = False
```


adhinene@sampat: ~/ppl/lab3
Prelude> :load q6.hs
[1 of 1] Compiling Main (q6.hs, interpreted)
q6.hs:3:1: warning: [-Wtabs]
Tab character found here, and in one further location.
Please use spaces instead.
| mod n 2==1 = False
^^^^^^^^
Ok, one module loaded.
*Main> checkeve 46
True
*Main> checkeve 47
False
*Main> checkeve 475698
True
*Main>

Q7)


absolute :: Int -> Int
absolute n | n>=0 = n
| n<0 = negate n


adhinene@sampat: ~/ppl/lab3
*Main> :load
Ok, no modules loaded.
Prelude> :load q7.hs
[1 of 1] Compiling Main (q7.hs, interpreted)
q7.hs:3:1: warning: [-Wtabs]
Tab character found here, and in one further location.
Please use spaces instead.
| n<0 = negate n
^^^^^^^^
Ok, one module loaded.
*Main> absolute 6678
6678
*Main> absolute -6678
<interactive>:73:1: error:
• No instance for (Num (Int -> Int)) arising from a use of '-'
(maybe you haven't applied a function to enough arguments?)
• In the expression: absolute - 6678
In an equation for 'it': it = absolute - 6678
*Main> absolute (-6678)
6678
*Main>

Q8)

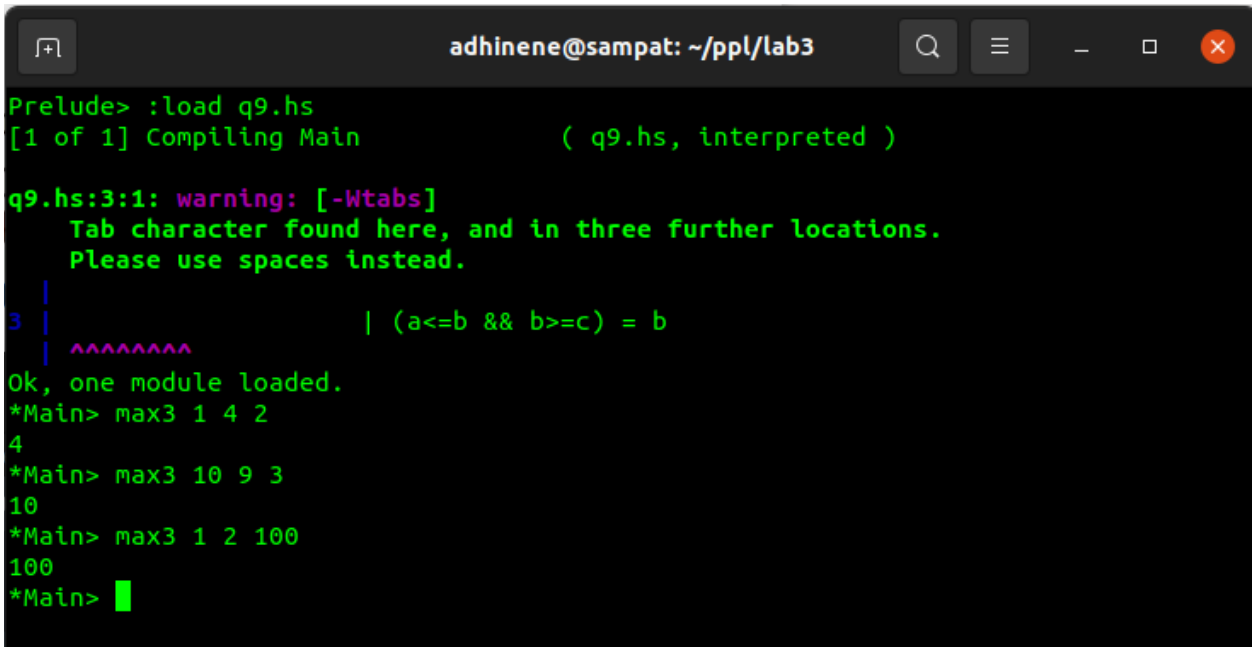
```haskell
maxi :: Int -> Int -> Int
maxi a b | (a>=b) = a
         | (a<b) = b
```

```
adhinene@sampat: ~/ppl/lab3
*Main> :load
Ok, no modules loaded.
Prelude> :load q8.hs
[1 of 1] Compiling Main             ( q8.hs, interpreted )

q8.hs:3:1: warning: [-Wtabs]
    Tab character found here, and in one further location.
    Please use spaces instead.
  |
3 |                  | (a<b) = b
  | ^^^^^^^^
Ok, one module loaded.
*Main> maxi 5 8
8
*Main> maxi 77 2
77
*Main>
```

Q9)

```haskell
max3 :: Int -> Int -> Int -> Int
max3 a b c | (a>=b && b>=c) = a
           | (a<=b && b>=c) = b
           | (a<=b && b<=c) = c
```



Q10)

```haskell
power :: Float -> Int -> Float
power x 0 = 1.0
power x n = x * (power x (n-1))
```

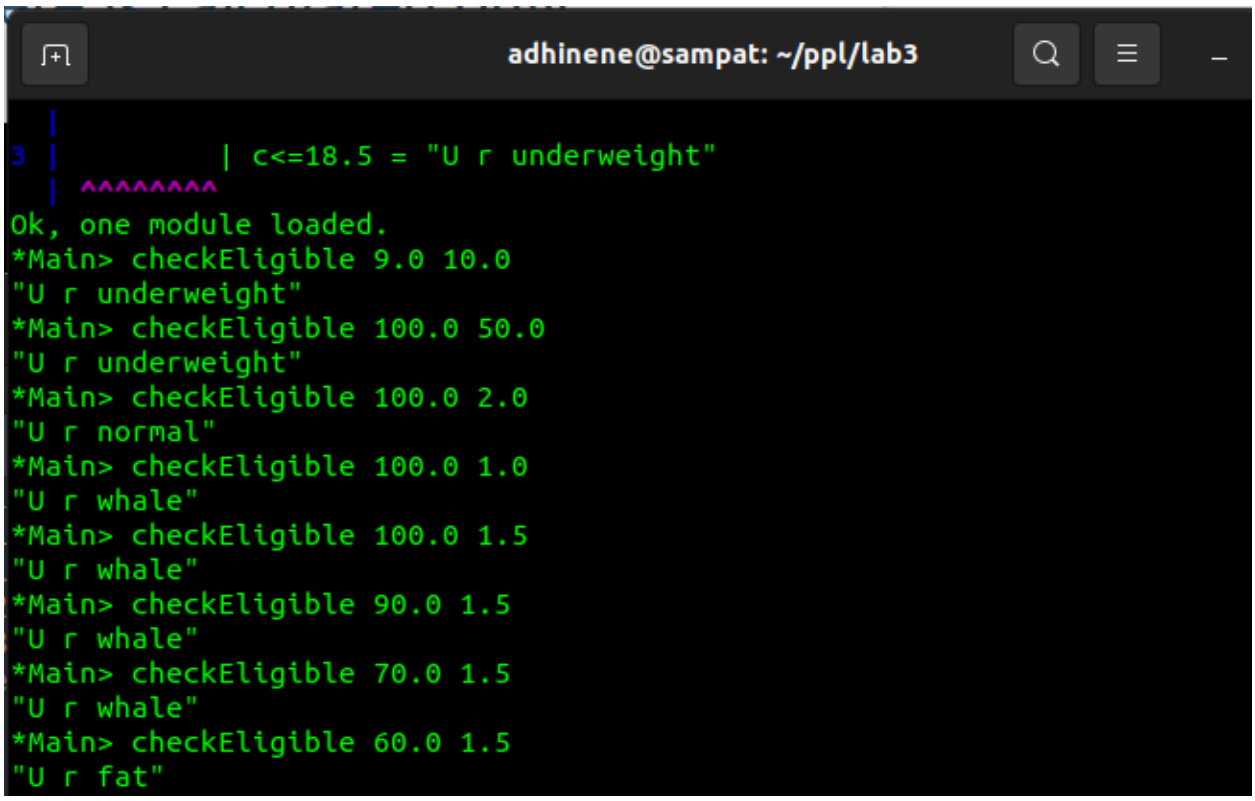
Q11)

```haskell
isValidName :: String -> String
isValidName "" = "It is not a valid name ."
isValidName name =name ++ "is a valid name ."
```

```
adhinene@sampat: ~/ppl/lab3
*Main> :load
Ok, no modules loaded.
Prelude> :load q11.hs
[1 of 1] Compiling Main             ( q11.hs, interpreted )
Ok, one module loaded.
*Main> isValidName ""
"It is not a valid name ."
*Main> isValidName "Sampat"
"Sampatis a valid name ."
*Main>
```

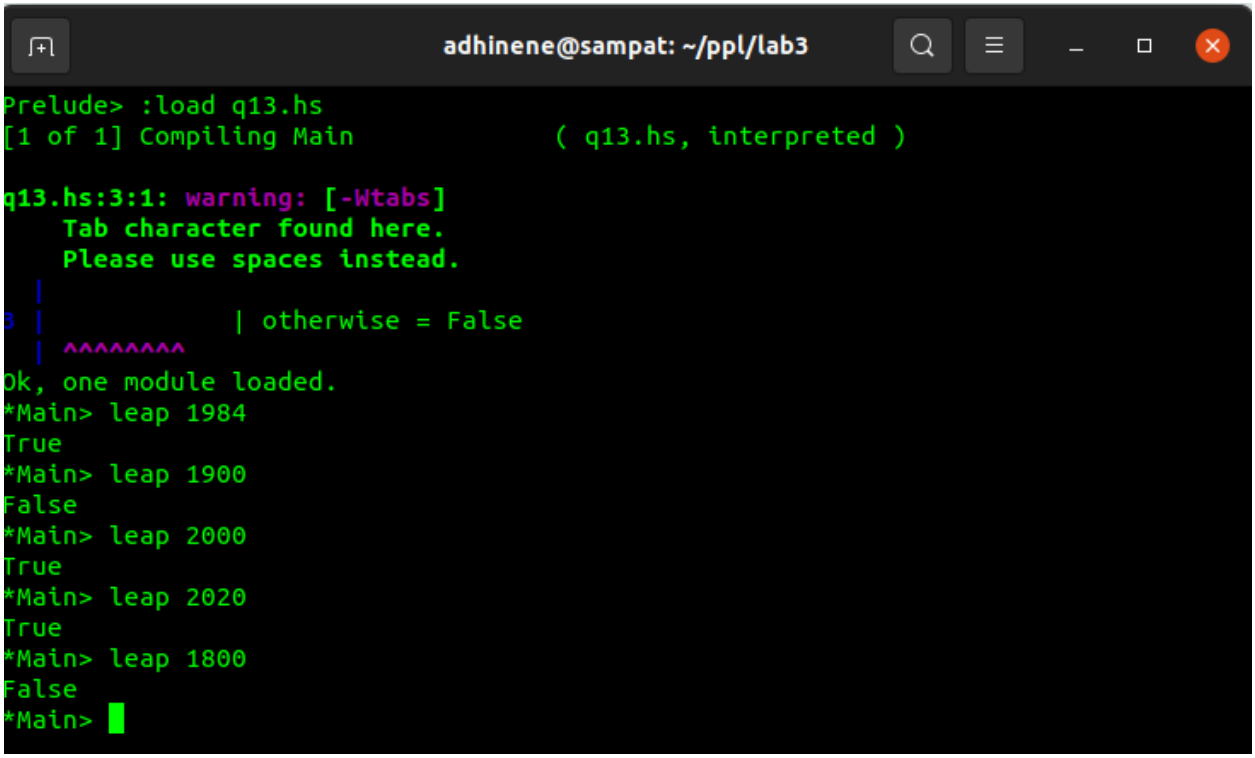
Q12)

```haskell
checkEligible :: (RealFloat a) => a-> a -> String
checkEligible a b
    | c<=18.5 = "U r underweight"
    | c<=25.0 = "U r normal"
    | c<=30.0 = "U r fat"
    | otherwise = "U r whale"
    where c=a/b ^ 2
```


adhinene@sampat: ~/ppl/lab3
| c<=18.5 = "U r underweight"
^^^^^^^^
Ok, one module loaded.
*Main> checkEligible 9.0 10.0
"U r underweight"
*Main> checkEligible 100.0 50.0
"U r underweight"
*Main> checkEligible 100.0 2.0
"U r normal"
*Main> checkEligible 100.0 1.0
"U r whale"
*Main> checkEligible 100.0 1.5
"U r whale"
*Main> checkEligible 90.0 1.5
"U r whale"
*Main> checkEligible 70.0 1.5
"U r whale"
*Main> checkEligible 60.0 1.5
"U r fat"

Q13)


leap :: Int -> Bool
leap n | (mod n 4)==0 && (mod n 100)>0 || (mod n 400)== 0 = True
| otherwise = False


adhinene@sampat: ~/ppl/lab3
Prelude> :load q13.hs
[1 of 1] Compiling Main (q13.hs, interpreted)
q13.hs:3:1: warning: [-Wtabs]
Tab character found here.
Please use spaces instead.
| otherwise = False
^^^^^^^^
Ok, one module loaded.
*Main> leap 1984
True
*Main> leap 1900
False
*Main> leap 2000
True
*Main> leap 2020
True
*Main> leap 1800
False
*Main>

Q14)

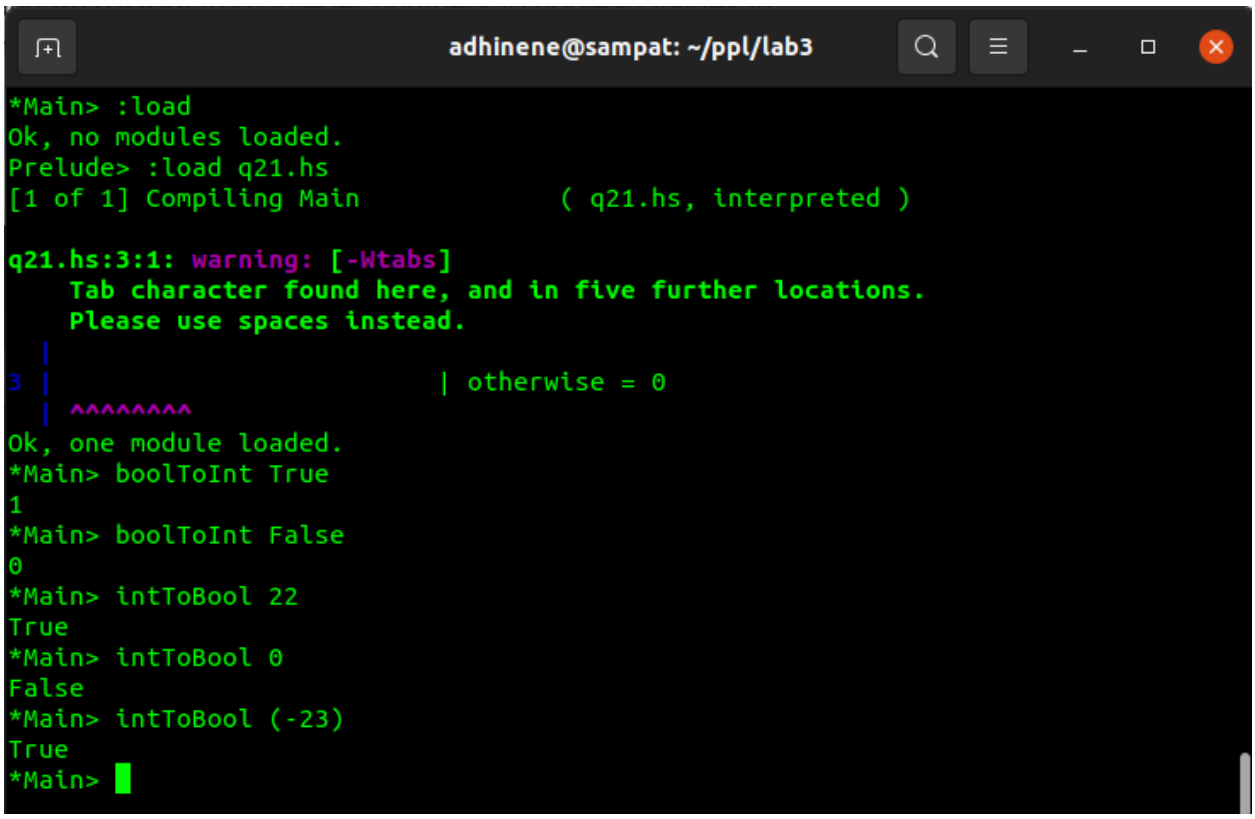
```haskell
modulus :: Float -> Float -> Float
modulus x y = sqrt(x^2 + y^2)
```

```
adhinene@sampat: ~/ppl/lab3
*Main> :load
Ok, no modules loaded.
Prelude> :load q14.hs
[1 of 1] Compiling Main             ( q14.hs, interpreted )
Ok, one module loaded.
*Main> modulus 1.0 2.0
2.236068
*Main> modulus 4 5
6.4031243
*Main> modulus 4 3
5.0
*Main>
```

Part - 2

Q1)

```haskell
boolToInt :: Bool -> Int
boolToInt n | (n==True)= 1
            | otherwise = 0
intToBool :: Int -> Bool
intToBool n | (n>0 || n<0)=True
            | (n==0)=False
```



Q2)

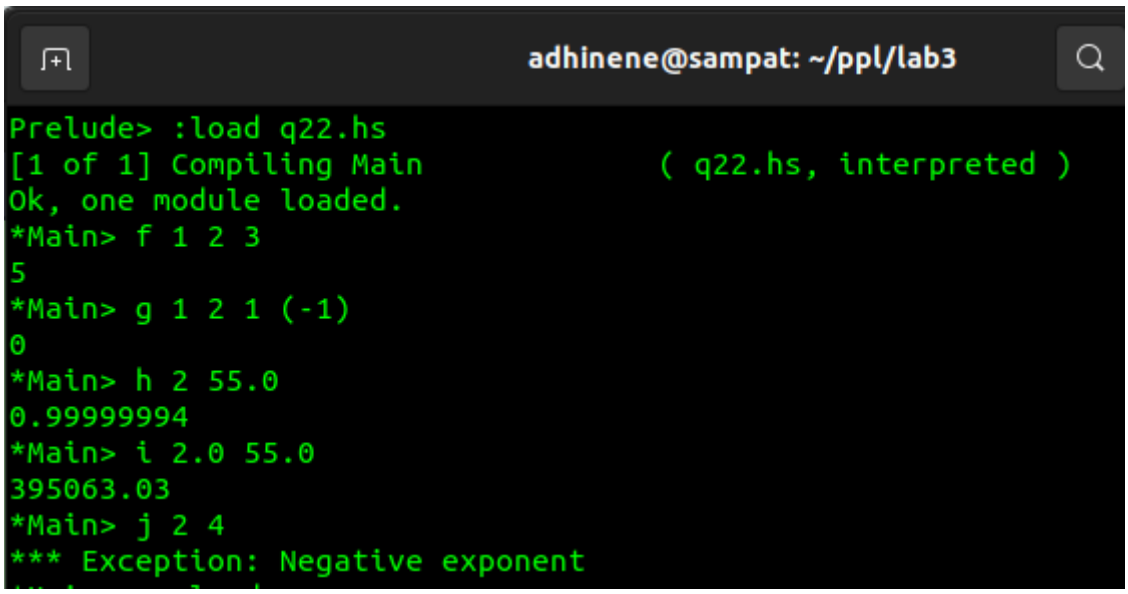
```haskell
f :: Int -> Int -> Int -> Int
f a b x = a*x + b

g :: Int -> Int -> Int -> Int -> Int
g a b c x = a*(x^2)+b*x + c

h :: Int -> Float -> Float
h n x = (sin(x))^n + (cos(x))^n

i :: Float -> Float -> Float
i r s = ((pi^2)*(r+s)*(r-s)^2)/4

j :: Int -> Float -> Float
j x y = y^(x^(-1))
```


adhinene@sampat: ~/ppl/lab3
Prelude> :load q22.hs
[1 of 1] Compiling Main (q22.hs, interpreted)
Ok, one module loaded.
*Main> f 1 2 3
5
*Main> g 1 2 1 (-1)
0
*Main> h 2 55.0
0.99999994
*Main> i 2.0 55.0
395063.03
*Main> j 2 4
*** Exception: Negative exponent