Task 1

1. Do `)CLEAR` your workspace.
2. Give your workspace a `)WSID`.
3. Do `)SAVE` your workspace.
4. Turn Dyalog `)OFF`.
5. Start Dyalog and `)LOAD` your workspace.

Task 2

Define a function `NoSpace` to remove spaces:

```
      NoSpace 'here is some text'
hereissometext
```

Task 3

Define a function `RemoveFrom` to remove any character:

```
      'l' RemoveFrom 'hello world'
heo word

      'o' RemoveFrom 'hello world'
hell wrld
```

Task 4

Redefine the function `NoSpace` using `RemoveFrom`:

```
NoSpace←{ ??? RemoveFrom ??? }

NoSpace 'hello world'
helloworld
```

Task 5

Save your workspace.

Task 6

Define a function `Mean` to return the mean average of its argument:

```
      Mean 3 1 4 1 5 9 2 6
3.875
      Mean 4 1 2 5
3
      Mean 6+⍳10
11.5
```

When you're done, `)fns` should show something like this:

```
      )fns
Mean
```

Task 7

Define a function `ID` to return an ω by ω identity matrix:

```
      ID 3
1 0 0
0 1 0
0 0 1
      ID 5
1 0 0 0 0
0 1 0 0 0
0 0 1 0 0
0 0 0 1 0
0 0 0 0 1
```

Task 8

Define a function `TimesRows` to multiply a matrix left argument and a vector right argument. For example:

```
      mat ← 4 3⍴6 9 9 10 9 1 3 5 3 6 7 3
      vec ← 1 0 ¯1

      mat TimesRows vec
 6 0 ¯9
10 0 ¯1
 3 0 ¯3
 6 0 ¯3
```

Task 9

Using the Residue function (|), define a function `Multiples` to return only elements of the vector ⍵ that are exact multiples of ⍺.

```
      7 Multiples 6 12 14 8 21 42 56 97 13
14 21 42 56

      3 Multiples 6 9 9 10 9 1 3 5 3 6 7 3
6 9 9 9 3 3 6 3

      10 Multiples 7 9 13   ⍝ empty vector result
```

Task 10

Define a function `RemoveEvery` to remove every ω^{th} number from the vector α:

```
      (⍳10) RemoveEvery 4
1 2 3 5 6 7 9 10
      (⍳15) RemoveEvery 3
1 2 4 5 7 8 10 11 13 14
      6 2 9 4 1 2 6 RemoveEvery 2
6 9 1 6
```

Task 11

Define a function `Extend` which catenates the integer α and the next ω integers.

```
      10 Extend 3
10 11 12 13

      ¯3 Extend 5
¯3 ¯2 ¯1 0 1 2

      ¯10 Extend 6
¯10 ¯9 ¯8 ¯7 ¯6 ¯5 ¯4
```

Task 12

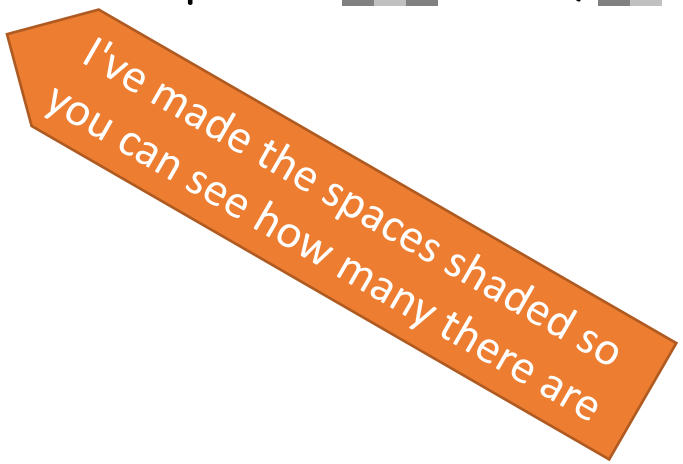
Using the `Extend` function you wrote, define a function `To` which produces integers from `⍺` to `⍵` inclusive.

```
      1 To 5
1 2 3 4 5

      10 To 15
10 11 12 13 14 15

      ¯3 To 5
¯3 ¯2 ¯1 0 1 2 3 4 5

      ¯10 To ¯6
¯10 ¯9 ¯8 ¯7 ¯6
```

Task 13

Define these variables that we'll use in the next few tasks:

```
      names ← 6 7⍴'Rich  Pav  HardeepAdam  Sally  Rodrigo'
      names
Rich
Pav
Hardeep
Adam
Sally
Rodrigo

      items←7 5⍴'applecat  dog  lemurfrog safe lemon'
      items
apple
cat
dog
lemur
frog
safe
lemon
```



Task 14

Define a function `ThatHave` to select rows of a text matrix `α` which contain the character `ω`:

```
      names ThatHave 'R'
Rich
Rodrigo
      names ThatHave 'a'
Pav
Hardeep
Adam
Sally
      names ThatHave 'x'   ⍝ zero-row result!
```

Task 15

Define a function `ThatBeginWith` to select rows of a text matrix ⍺ which **begin with** the character ⍵:

```
      names ThatBeginWith 'R'
Rich
Rodrigo
      names ThatBeginWith 'A'
Adam
      names ThatBeginWith 'X'  ⍝ zero-row result!
```

Task 16

Define a function `TextLengths` that takes a matrix `⍵` and counts how many non-spaces there are in each row.

```
    TextLengths names
4 3 7 4 5 7

    TextLengths items
5 3 3 5 4 4 5

    TextLength 0 5⍴''    ⍝ no rows; no lengths!
```

Task 17

Using `TextLengths`, define a function `OfLength` to select rows of a text matrix `α` where text (non-spaces) are of length `ω`:

```
      names OfLength 4
Rich
Adam
      names OfLength 7
Hardeep
Rodrigo

      items OfLength 5
apple
lemur
lemon
```

Task 18

Define a function `RollN` that simulates rolling six-sided dice. ⍵ is the number of dice to roll. Then return the total:

```
      RollN 3          ⍝ your result may vary!
11
      RollN 3          ⍝ your result may vary!
10
      RollN 1000       ⍝ your result may vary!
3548
      ⌊0.5+0.00001×+/RollN 1000000
35
```

Task 19

Save your workspace

Email ***your_name*.dws** to workshops@dyalog.com

Make sure to put your name in the email so we know it is from you!