

Lab 8 – Exercise 1

Windchill

GIVENS: *(none)*

RESULT: *(none)*

INTERMEDIATED: tempArr	(reference to an array of temperatures in °C)
nt	(size of the temperature array)
speedArr	(reference to an array of wind speeds in km/h)
ns	(size of the wind speed array)
chillTable	(reference to a windchill matrix for nt rows and ns columns)

HEADER: main()

BODY:

(Get the data from the user)

```
printLine("Enter a set of temperatures between -50 and +5: ")
```

```
(tempArr, nt) ← readRealLine()
```

```
printLine("Enter a set of wind speeds >= 5.0: ")
```

```
(speedArr, ns) ← readRealLine()
```

(Call the algorithm to create the windchill matrix)

```
chillTable ← createWindChillTable(tempArr, nt, speedArr, ns)
```

(Print the windchill table – assume the algorithm is available)

```
printTable(tempArr, nt, speedArr, ns, chillTable)
```

GIVENS: temperature (*in degrees Celsius*)

windSpeed (in km/hr – must be ≥ 5.0)

RESULT: chill (temperature taking into account the wind speed)

INTERMEDIATES: vFactor (*wind speed to the power of 0.16*)

HEADER: `chill ← windChill(temperature, windSpeed)`

BODY:

$$\text{vFactor} = \text{windSpeed}^{0.16}$$
$$\text{chill} = 13.12 + 0.6215 \times \text{temperature} - 11.37 \times \text{vFactor} + 0.3965 \times \text{temperature} \times \text{vFactor}$$

GIVENS:

tempArray (reference to an array of temperatures in °C)

nt (size of the temperature array)

speedArray (reference to an array of wind speeds in km/h)

ns (size of the wind speed array)

RESULT: chillTable (reference to a windchill matrix for nt rows and ns columns)

INTERMEDIATES

t (index into temperature array tempArray)

s (index into wind speed array speedArray)

HEADER:

chillTable $\leftarrow$ createWindChillTable(tempArray, nt, speedArr, ns)

