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CMSC 150 – B1L

To access the app, follow the link specified in “TO\_ACCESS\_APP.txt”

QSI & Simplex Calculator: Manual

Navigate through this app using the options in the menu bar, just below the title.

For **Quadratic Spline Interpolation** all you have to do is type the values: **the value to be evaluated, the independent, and dependent values**. You can check if the values you entered are correct by observing the reactive printing of the vectors just next to the input boxes. Once you've checked the values, hit **'Compute'** and the solution will appear below, on the **'Solution's part'**. To move on to your next computation, just type your value to evaluate, x and y values again then hit 'Compute'.

**qsi.fxns are the polynomials per interval, and y is your value x evaluated at the appropriate function for x's interval**

For **Simplex Method**, type your constraints and Z equation. **The 'Remove' button will remove the last function you entered, while retyping the Z equation will rewrite your previously entered Z equation. The 'Reset' button will erase all of the functions you previously entered.** To add a new equation just clear the input box and type your new equation then hit 'Add equation'.

You will be able to see all of the functions you entered below the input boxes. The solution will show the final tableau, basic solution, and optimal value.

For maximization, your slack variables are the x variables, and the s variables are your computed values, and the opposite for minimization.

You will be able to see all of the functions you entered below the input boxes. The solution will show the final tableau, basic solution, and optimal value.

You must strictly follow this format:

- 1) When entering equations, you must always include the coefficient regardless if it's 1 or not;
- 2) You must always include all variables, ex.:  $1x_1 + 0x_2 \leq 9$ ;
- 3) This program doesn't check whether you put the right variables, and their subscripts, or not. It assumes all of your equations have the right order of variables. ( $x_1 x_2 x_3 x_4 \dots$ );
- 4) You must not forget to add 1 to  $x_1$ , this program does not accept  $x_1$  as a valid term. Please bear that in mind.
- 5) You must always input equations with the same number of variables.

**For easy testing in both QSI and Simplex, you can use the equations and data specified under the 'Test Cases' tab. Just copy each equation one-by-one to their respective text boxes.**

## Adding equations

### 1.) Type the equation

#### Simplex Method

Type constraints equations here:

$7x_1 + 11x_2 \leq 77$

Add Equation

Remove

Type Z equation here:

$Z = 3x_1 + 4x_2$

Add equation

Choose operation

Minimization

Maximization

Reset

Equations

Solution

### 2.) Hit 'Add Equation'

#### Simplex Method

Type constraints equations here:

$7x_1 + 11x_2 \leq 77$

Add Equation

Remove

Type Z equation here:

$Z = 3x_1 + 4x_2$

Add equation

Choose operation

Minimization

Maximization

Reset

Equations

Solution

```
[[1]]
[1] "7x1 + 11x2 <= 77"
```

### 3.) Highlight the previous equation you entered

#### QSI & Simplex Calculator

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#### Simplex Method

Type constraints equations here:

$7x_1 + 11x_2 \leq 77$

Add Equation

Remove

Type Z equation here:

$Z = 3x_1 + 4x_2$

Add equation

Choose operation

Minimization

Maximization

Reset

Equations

Solution

```
[[1]]
[1] "7x1 + 11x2 <= 77"
```

#### 4.) Type the next equation.

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#### Simplex Method

Type constraints equations here:

$10x_1 + 8x_2 \leq 80$

Add Equation

Remove

Type Z equation here:

$Z = 3x_1 + 4x_2$

Add equation

Choose operation

Minimization

Maximization

Reset

Equations

```
[[1]]
[1] "7x1 + 11x2 <= 77"
```

Solution

#### 5.) Hit 'Add equation' again

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#### Simplex Method

Type constraints equations here:

$10x_1 + 8x_2 \leq 80$

Add Equation

Remove

Type Z equation here:

$Z = 3x_1 + 4x_2$

Add equation

Choose operation

Minimization

Maximization

Reset

Equations

```
[[1]]
[1] "7x1 + 11x2 <= 77"

[[2]]
[1] "10x1 + 8x2 <= 80"
```

Solution

Removing an equation

'Remove' will erase the equation you previously entered

Before 'Remove'

Simplex Method

Type constraints equations here:

10x1 + 8x2 <= 80

Add Equation Remove

Choose operation

Minimization Maximization Reset

Equations

[[1]]  
[1] "7x1 + 11x2 <= 77"  
[[2]]  
[1] "10x1 + 8x2 <= 80"

Solution

After 'Remove'

Simplex Method

Type constraints equations here:

10x1 + 8x2 <= 80

Add Equation Remove

Choose operation

Minimization Maximization Reset

Equations

[[1]]  
[1] "7x1 + 11x2 <= 77"

Solution