Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

and we want $j[i]x[i] + k[i]y[i] = gcd(k[i], j[i])$

Example: $k = 184, j = 69$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

and we want $j[i]x[i] + k[i]y[i] = gcd(k[i], j[i])$

Example: $k = 184, j = 69$

i	$k[i]$	$=$	$j[i]q[i]$	$+$	$r[i]$	$k[i]$	$j[i]$	$r[i]$	$q[i]$	$y[i]$	$x[i]$
0	184	$=$	69(2)	$+$	46	184	69	46	2		
1	69	$=$	46(1)	$+$	23	69	46	23	1		
2	46	$=$	23(2)	$+$	0	46	23	0	2		

1) First run the regular GCD algorithm: get $gcd(184, 69) = 23$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

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Example: $k = 184, j = 69$

i	$k[i]$	$=$	$j[i]q[i]$	$+$	$r[i]$	$k[i]$	$j[i]$	$r[i]$	$q[i]$	$y[i]$	$x[i]$
0	184	$=$	69(2)	$+$	46	184	69	46	2		
1	69	$=$	46(1)	$+$	23	69	46	23	1		
2	46	$=$	23(2)	$+$	0	46	23	0	2	0	1

1) First run the regular GCD algorithm: get $gcd(184, 69) = 23$

2) Then calculate $y[2] = 0, x[2] = 1$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

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0	184	=	69(2)	+	46	184	69	46	2		
1	69	=	46(1)	+	23	69	46	23	1		
2	46	=	23(2)	+	0	46	23	0	2	0	1

1) First run the regular GCD algorithm: get $gcd(184, 69) = 23$

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3) Continue bottom-up, calculating the $x[i], y[i]$ from (*) and (**)

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

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0	184	$=$	69(2)	$+$	46	184	69	46	2		
1	69	$=$	46(1)	$+$	23	69	46	23	1	1	-1
2	46	$=$	23(2)	$+$	0	46	23	0	2	0	1

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0	184	$=$	69(2)	$+$	46	184	69	46	2	-1	3
1	69	$=$	46(1)	$+$	23	69	46	23	1	1	-1
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1) First run the regular GCD algorithm: get $gcd(184, 69) = 23$

2) Then calculate $y[2] = 0, x[2] = 1$

3) Continue bottom-up, calculating the $x[i], y[i]$ from (*) and (**)

4) We are done! Note that $184(-1) + 69(3) = 23 = gcd(184, 69)$.

Recall that $(**)\ y[i-1] = x[i]$ and $(*)\ x[i-1] = y[i] - q[i-1]x[i]$

and we want $j[i]x[i] + k[i]y[i] = gcd(k[i], j[i])$

Example: $k = 99, j = 63$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

and we want $j[i]x[i] + k[i]y[i] = gcd(k[i], j[i])$

Example: $k = 99, j = 63$

i	$k[i]$	$=$	$j[i]q[i]$	$+$	$r[i]$	$k[i]$	$j[i]$	$r[i]$	$q[i]$	$y[i]$	$x[i]$
0	99	=	63(1)	+	36	99	63	36	1		
1	63	=	36(1)	+	27	63	36	27	1		
2	36	=	27(1)	+	9	36	27	9	1		
3	27	=	9(3)	+	0	27	9	0	3		

1) First run the regular GCD algorithm: get $gcd(99, 63) = 9$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

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Example: $k = 99, j = 63$

i	$k[i]$	$=$	$j[i]q[i]$	$+$	$r[i]$	$k[i]$	$j[i]$	$r[i]$	$q[i]$	$y[i]$	$x[i]$
0	99	=	63(1)	+	36	99	63	36	1		
1	63	=	36(1)	+	27	63	36	27	1		
2	36	=	27(1)	+	9	36	27	9	1		
3	27	=	9(3)	+	0	27	9	0	3	0	1

1) First run the regular GCD algorithm: get $gcd(99, 63) = 9$

2) Then calculate $y[3] = 0, x[3] = 1$

Recall that (**) $y[i-1] = x[i]$ and (*) $x[i-1] = y[i] - q[i-1]x[i]$

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0	99	$=$	63(1)	$+$	36	99	63	36	1		
1	63	$=$	36(1)	$+$	27	63	36	27	1		
2	36	$=$	27(1)	$+$	9	36	27	9	1	1	-1
3	27	$=$	9(3)	$+$	0	27	9	0	3	0	1

1) First run the regular GCD algorithm: get $gcd(99, 63) = 9$

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0	99	$=$	63(1)	$+$	36	99	63	36	1		
1	63	$=$	36(1)	$+$	27	63	36	27	1	-1	2
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i	$k[i]$	$=$	$j[i]q[i]$	$+$	$r[i]$	$k[i]$	$j[i]$	$r[i]$	$q[i]$	$y[i]$	$x[i]$
0	99	=	63(1)	+	36	99	63	36	1	2	−3
1	63	=	36(1)	+	27	63	36	27	1	−1	2
2	36	=	27(1)	+	9	36	27	9	1	1	−1
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0	99	$=$	63(1)	$+$	36	99	63	36	1	2	-3
1	63	$=$	36(1)	$+$	27	63	36	27	1	-1	2
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2) Then calculate $y[3] = 0, x[3] = 1$

3) Continue bottom-up, calculating the $x[i], y[i]$ from (*) and (**)

4) We are done! Note that $99(2) + 63(-3) = 9 = gcd(99, 63)$.