|   | Χ | А                 | Т     | G          |
|---|---|-------------------|-------|------------|
| Υ |   | →                 | → . – | →.         |
| G |   | $\Rightarrow$ $-$ | → -   | <i>□</i>   |
| G |   | ⇒ . –             | ⇒ -   | <b>A</b>   |
| А | _ | ⇒                 | → —   | → <u> </u> |
| А | _ | ⇒ _               | → -   | → .        |
| Т | _ | $\Rightarrow$ $-$ | → _   | ⇒ <u> </u> |
| G |   | →                 | 3 -   | <b>→</b> . |
| G |   | $\rightarrow$ $-$ | → —   | → <b>.</b> |

|   | Χ   | А           | Т           | G             |
|---|-----|-------------|-------------|---------------|
| Υ | 0 - | <b>→.</b> – | <b>→.</b> – | → <u>.</u>    |
| G |     | → . –       | → - /       | <b>&gt;</b> - |
| G |     | ⇒           | →           | →             |
| А |     | ⇒           | →           | → .           |
| А |     | → -         | →           | → .           |
| Т | _   | ⇒           | → <u> </u>  | → .<br>□      |
| G |     | → -         | <b>→</b> -  | → .           |
| G |     | ⇒           | ⇒           | → .           |

|   | X   | А                 | Т          | G               |
|---|-----|-------------------|------------|-----------------|
| Y | 0 - | <b>→-2</b>        | → <u> </u> | <b>→</b> .      |
| G |     | $\Rightarrow$ $-$ | → - \      | <i>□</i>        |
| G | _   | ⇒                 | <i>→</i> – | → .             |
| А |     | A -               | 3          | →               |
| А |     | → _               | 3 -        | <b>→</b>        |
| Т |     | 3 -               | → _        | <b>→</b>        |
| G |     | 3                 | →          | <b>→</b> .      |
| G |     | 3 -               | → —        | $\rightarrow$ . |

|   | X   | А                 | Т              | G          |
|---|-----|-------------------|----------------|------------|
| Υ | 0 - | <b>→-2</b> -      | <b>-&gt;-4</b> | <b>→</b> . |
| G |     | $\Rightarrow$ $-$ | →              | ⇒ <b>.</b> |
| G |     | 3 -               | 3 -            | <b>→</b>   |
| А | . – | 3 -               | 3              | →          |
| А |     | → -               | 3 -            | <b>A</b>   |
| Т | . – | → —               | <b>3</b>       | <b>→</b>   |
| G |     | → . –             | →              | → .        |
| G |     | →                 | <b>&gt;</b> -  | <b>→</b> . |

|   | X   | А                 | Т                 | G               |
|---|-----|-------------------|-------------------|-----------------|
| Υ | 0 - | <b>→-2</b> -      | <b>-&gt;-4</b> -  | <b>→-6</b>      |
| G |     | $\Rightarrow$ $-$ | →                 | → .<br>¬        |
| G |     | 3 -               | 3                 | →               |
| А |     | 3                 | →                 | → .             |
| А |     | 3                 | → _               | → .             |
| Т |     | → _               | → <u> </u>        | → .             |
| G |     | 3                 | → . –             | → .             |
| G | •   | →                 | $\rightarrow$ $-$ | $\rightarrow$ . |

|   | X   | А                 | Т                 | G           |
|---|-----|-------------------|-------------------|-------------|
| Υ | 0 - | <b>2</b> -        | <b>-4</b> -       | →-6         |
| G | -2  |                   | 3 -               | →<br>→      |
| G | ,   | <b>—</b>          | 3                 | → .         |
| А |     |                   | <b>3</b>          | → .         |
| А | ,   | → . –             | 3                 | → .         |
| Т |     | <b>—</b>          | → _               | → .         |
| G |     |                   |                   | <b>&gt;</b> |
| G | •   | $\Rightarrow$ $-$ | $\rightarrow$ $-$ | <b>→</b>    |

|   | X    | Α           | Т            | G          |
|---|------|-------------|--------------|------------|
| Υ | 0 -  | <b>-2</b> - | <b>4</b>     | <b>→-6</b> |
| G | -2 - | A           | →            | → .        |
| G | -4   | → -         | → _          | → .        |
| А | -6   | 3           | → _          | → .        |
| А | -8   | 3           | → _          | → .        |
| Т | -10  | → _         | →            | → .        |
| G | -12  |             | → . –        | → .<br>A   |
| G | -14  | <i>→</i> –  | <b>→</b> • − | <b>→</b> . |

|   | X           | А            | Т                | G          |
|---|-------------|--------------|------------------|------------|
| Υ | 0 -         | <b>→-2</b> - | <b>-&gt;-4</b> - | <b>→-6</b> |
| G | <b>-2</b> - | <b>3</b> -1  | → _              | → _        |
| G | -4          | → -          | →                | → .        |
| А | -6          | 3            | → . –            | → .        |
| А | -8          | 3            | →                | → .        |
| Т | -10         | →            | → . –            | → .        |
| G | -12         | →            | →                | <b>→</b> . |
| G | -14         | →            | <b>→</b> • −     | <b>→</b> . |

|   | X    | Α   | Т                 | G          |
|---|------|---|-------------------|------------|
| Υ | 0 -  | <b>→-2</b> -  | <b>→-4</b> -      | <b>→-6</b> |
| G | -2 - | <u>4</u><br>→-1 -   | <b>→-3</b>        | → .<br>¬ → |
| G | -4   | → _   | → . —             | → .        |
| А | -6   | →   | <b>→</b> . –      | → .        |
| А | -8   | → _   | <b>→</b> -        | → .        |
| Т | -10  | → <u> </u>  | → . —             | → .        |
| G | -12  | → . –   | $\rightarrow$ $-$ | → .        |
| G | -14  | $\rightarrow$ $\stackrel{\bullet}{}$ $\stackrel{\bullet}{}$ | <b>→</b> . –      | → .        |

|   | X   | А                 | Т                 | G               |
|---|-----|-------------------|-------------------|-----------------|
| Υ | 0 - | <b>→-2</b> -      | <b>→-4</b> -      | <b>→-6</b>      |
| G | -2  | <b>1</b> –        | » <b>-3</b>       | →- <b>1</b>     |
| G | -4  | 3 -               | → . –             | → .             |
| А | -6  | → _               | → . –             | → .             |
| А | -8  | <i>→ −</i>        | → . —             | → .             |
| Т | -10 | → _               | → . –             | → .             |
| G | -12 | → —               | → . —             | → .             |
| G | -14 | $\Rightarrow$ $-$ | $\rightarrow$ $-$ | $\rightarrow$ . |

|   | X   | А            | Т            | G               |
|---|-----|--------------|--------------|-----------------|
| Y | 0 - | <b>→-2</b> - | <b>4</b>     | <b>→-6</b>      |
| G | -2  | -1 -         | <b>→-3</b>   | ×-1             |
| G | -4  | -3           | →            | → .             |
| А | -6  | → _          | → . –        | → .             |
| А | -8  | → —          | →            | → .             |
| Т | -10 | 3 -          | → . –        | → .             |
| G | -12 | → _          | →            | <b>→</b> .      |
| G | -14 | → <u> </u>   | <b>→</b> . – | $\rightarrow$ . |

|   | X   | А            | Т          | G          |
|---|-----|--------------|------------|------------|
| Υ | 0 - | <b>→-2</b> - | <b>4</b>   | <b>→-6</b> |
| G | -2  | <b>1</b> –   | <b>→-3</b> | ×-1        |
| G | -4  | -3           | -2         | A .        |
| А | -6  | → _          | → . –      | → .        |
| А | -8  | 3            | → _        | → .        |
| Т | -10 | → _          | →          | → .        |
| G | -12 | 3            | →          | <b>→</b> . |
| G | -14 | 3 -          | <b>→</b> - | → <b>.</b> |

|   | X   | А            | Т            | G               |
|---|-----|--------------|--------------|-----------------|
| Υ | 0 - | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>      |
| G | -2  | <b>1</b> –   | → <b>-3</b>  | ¥<br>→-1        |
| G | -4  | -3           | <b>2</b>     | <b>0</b>        |
| А | -6  | →            | <b>→</b> . – | → .             |
| А | -8  | → _          | →            | <b>→</b>        |
| Т | -10 | →            | → . –        | $\rightarrow$ . |
| G | -12 | → —          | → . –        | → .             |
| G | -14 | → • -        | <b>→</b> . – | <b>→</b> .      |

|   | X   | А              | T            | G          |
|---|-----|----------------|--------------|------------|
| Y | 0 - | <b>→-2</b>     | <b>→-4</b> - | <b>→-6</b> |
| G | -2  | <b>1</b>       | »-3          | →-1        |
| G | -4  | -3             | -2           | <b>0</b>   |
| А | -6  | <b>3</b><br>-1 | → . –        | → .        |
| А | -8  | → _            | →            | →          |
| Т | -10 | →              | →            | → .        |
| G | -12 | →              | →            | → .        |
| G | -14 | <b>→</b> . –   | <b>→</b> . – | → .        |

|   | X   | А            | T             | G               |
|---|-----|--------------|---------------|-----------------|
| Y | 0 - | <b>→-2</b>   | <b>→-4</b> -  | <b>→-6</b>      |
| G | -2  | <b>1</b>     | »-3           | →-1             |
| G | -4  | -3           | -2            | <b>0</b>        |
| А | -6  | ×-1 -        | <b>&gt;-3</b> | → .             |
| Α | -8  | →            | <b>→</b> -    | → .             |
| Т | -10 | → . –        | <b>→</b> . –  | → .             |
| G | -12 | → . —        | <b>→</b> . –  | $\rightarrow$ . |
| G | -14 | <b>→</b> . – | <b>→</b> . –  | <b>→</b>        |

|   | X    | А            | T             | G               |
|---|------|--------------|---------------|-----------------|
| Y | 0 -  | <b>→-2</b>   | <b>→-4</b> -  | <b>→-6</b>      |
| G | -2 - | →-1 -        | →-3           | <b>3</b><br>→-1 |
| G | -4   | -3           | -2            | → <b>0</b>      |
| А | -6   | ×-1 -        | <b>&gt;-3</b> | <b>-2</b>       |
| А | -8   | →            | →             | → .             |
| Т | -10  | → . –        | → . –         | → .             |
| G | -12  | →            | →             | $\Rightarrow$   |
| G | -14  | <b>→</b> . – | <b>→</b> . –  | <b>→</b>        |

|   | X   | Α            | T            | G          |
|---|-----|--------------|--------------|------------|
| Υ | 0 - | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b> |
| G | -2  | × 1 -        | <b>→-3</b>   | <b>1</b>   |
| G | -4  | -3           | -2           | )<br>0     |
| А | -6  | <b>1</b>     | <b>→-3</b>   | -2         |
| А | -8  | -3           | ⇒ . –        | → .        |
| Т | -10 | →            | →            | → .        |
| G | -12 | <b>→</b> -   | <b>→</b> . – | → .        |
| G | -14 | ⇒ . –        | ⇒ . –        | → .        |

|   | X   | А            | Т             | G           |
|---|-----|--------------|---------------|-------------|
| Υ | 0 - | <b>→-2</b> - | <b>→-4</b> -  | <b>→-6</b>  |
| G | -2  | ×-1 -        | <b>→-3</b>    | →- <b>1</b> |
| G | -4  | -3           | <b>-2</b>     | )<br>0      |
| А | -6  | <b>-1</b>    | <b>&gt;-3</b> | <b>-2</b>   |
| А | -8  | -3           | <b>-2</b>     | →           |
| Т | -10 | <i>y</i> −   | →             | → .         |
| G | -12 | → . –        | →             | → <b>.</b>  |
| G | -14 | ⇒            | <b>3</b>      | → .         |

|   | X    | А            | Т            | G                           |
|---|------|--------------|--------------|-----------------------------|
| Υ | 0 -  | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2 - | <b>1</b>     | →-3          | →-1                         |
| G | -4   | -3           | -2           | )<br>0                      |
| А | -6   | <b>1</b>     | <b>→-3</b>   | -2                          |
| А | -8   | -3           | -2           | <sup>y</sup><br>→- <b>4</b> |
| Т | -10  | →            | →            | →                           |
| G | -12  | → . –        | → . –        | → .                         |
| G | -14  | ⇒ . –        | ⇒ . –        | → .                         |

|   | X    | Α            | Т            | G                           |
|---|------|--------------|--------------|-----------------------------|
| Υ | 0 -  | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2 - | <b>1</b>     | →-3          | →-1                         |
| G | -4   | -3           | -2           | )<br>0                      |
| А | -6   | <b>1</b>     | <b>→-3</b>   | -2                          |
| А | -8   | -3           | -2           | <sup>y</sup><br>→- <b>4</b> |
| Т | -10  | -5           | →            | →                           |
| G | -12  | → . –        | → . –        | → .                         |
| G | -14  | <b>A</b> -   | <b>3</b>     | <b>→</b> •                  |

|   | X    | А            | Т            | G                           |
|---|------|--------------|--------------|-----------------------------|
| Υ | 0 -  | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2 - | <b>1</b> –   | →-3          | →-1                         |
| G | -4   | -3           | -2           | )<br>0                      |
| А | -6   | <b>-1</b>    | <b>→-3</b>   | -2                          |
| А | -8   | 3            | -2           | <sup>4</sup><br>→- <b>4</b> |
| Т | -10  | -5           | <b>0</b>     | → .                         |
| G | -12  | →            | →            | → .<br>A                    |
| G | -14  | <b>→</b> -   | <b>3</b>     | <b>→</b> .                  |

|   | X   | А            | T            | G                           |
|---|-----|--------------|--------------|-----------------------------|
| Υ | 0 - | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2  | <b>1</b>     | → <b>-3</b>  | →-1                         |
| G | -4  | -3           | -2           | → <b>0</b>                  |
| А | -6  | ×-1 -        | <b>→-3</b>   | -2                          |
| А | -8  | 3            | -2           | <sup>y</sup><br>→- <b>4</b> |
| Т | -10 | -5           | ) O -        | <b>→-2</b>                  |
| G | -12 | →            | → . –        | → .                         |
| G | -14 | → _          | <b>A</b>     | → ·                         |

|   | X    | Α              | Т            | G                           |
|---|------|----------------|--------------|-----------------------------|
| Υ | 0 -  | <b>→-2</b> -   | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2 - | <b>1</b>       | →-3          | →-1                         |
| G | -4   | -3             | -2           | )<br>0                      |
| А | -6   | <b>1</b>       | <b>→-3</b>   | -2                          |
| А | -8   | -3             | -2           | <sup>4</sup><br>→- <b>4</b> |
| Т | -10  | -5             | ) O -        | <b>→-2</b>                  |
| G | -12  | → <b>-</b> 7 - | → . –        | → .<br>A                    |
| G | -14  | <b>3</b>       | <b>—</b>     | <b>→</b> .                  |

|   | Х    | А              | Т            | G                           |
|---|------|----------------|--------------|-----------------------------|
| Υ | 0 -  | <b>→-2</b> -   | <b>→-4</b> - | <b>→-6</b>                  |
| G | -2 - | <b>1</b>       | →-3          | →-1                         |
| G | -4   | -3             | -2           | )<br>0                      |
| А | -6   | <b>1</b>       | <b>→-3</b>   | -2                          |
| А | -8   | -3             | -2           | <sup>4</sup><br>→- <b>4</b> |
| Т | -10  | -5             | ) O -        | <b>→-2</b>                  |
| G | -12  | → <b>-</b> 7 - | -2           | → <u> </u>                  |
| G | -14  | <b>3</b>       | <b>—</b>     | <b>→</b> .                  |

|   | X    | А            | Т             | G                        |
|---|------|--------------|---------------|--------------------------|
| Υ | 0 -  | <b>→-2</b> - | <b>→-4</b> -  | <b>→-6</b>               |
| G | -2 - | →-1 -        | → <b>-3</b>   | →-1                      |
| G | -4   | -3           | -2            | <b>0</b>                 |
| А | -6   | <b>-1</b>    | <b>&gt;-3</b> | <b>2</b>                 |
| А | -8   | 3            | <b>-2</b>     | <sup>3</sup> → <b>-4</b> |
| Т | -10  | -5           | 0 -           | <b>→-2</b>               |
| G | -12  | <b>-7</b>    | -2            | 3                        |
| G | -14  | <b>→</b> . – | <b>→</b> . –  | $\rightarrow$            |

|   | Х   | А          | Т             | G           |
|---|-----|------------|---------------|-------------|
| Y | 0 - | <b>→-2</b> | <b>→-4</b> -  | <b>→-6</b>  |
| G | -2  | <b>1</b>   | → <b>-3</b>   | →-1         |
| G | -4  | -3         | -2            | <b>0</b>    |
| А | -6  | <b>-1</b>  | <b>&gt;-3</b> | <b>2</b>    |
| Α | -8  | 3          | <b>-2</b>     | → <b>-4</b> |
| Т | -10 | <b>-5</b>  | <b>0</b> –    | <b>→-2</b>  |
| G | -12 | <b>-7</b>  | -2            | 3           |
| G | -14 | -9         | <b>→</b> . –  | →           |

|   | Х    | А            | Т                      | G                        |
|---|------|--------------|------------------------|--------------------------|
| Υ | 0 -  | <b>→-2</b> - | <b>→-4</b> -           | <b>→-6</b>               |
| G | -2 - | <b>1</b>     | →-3                    | →-1                      |
| G | -4   | -3           | <sup>1</sup> <b>-2</b> | $\rightarrow$ 0          |
| А | -6   | -1           | <b>→-3</b>             | <b>2</b>                 |
| А | -8   | 3            | -2 -                   | <sup>3</sup> → <b>-4</b> |
| Т | -10  | -5           | <b>0</b> –             | <b>→-2</b>               |
| G | -12  | <b>→-7</b>   | -2                     | 3                        |
| G | -14  | -9           | <b>-4</b>              | → .                      |

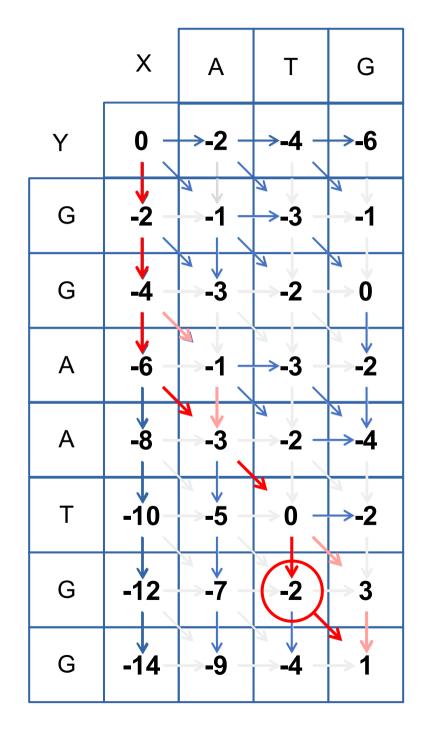
|   | X   | А            | Т            | G                        |
|---|-----|--------------|--------------|--------------------------|
| Y | 0 - | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>               |
| G | -2  | <b>1</b>     | <b>→-3</b>   | →-1                      |
| G | -4  | -3           | -2           | )<br>0                   |
| А | -6  | <b>-1</b>    | <b>→-3</b>   | <b>2</b>                 |
| А | -8  | 3            | -2           | <sup>3</sup> → <b>-4</b> |
| Т | -10 | <b>-5</b>    | <b>0</b> –   | <b>→-2</b>               |
| G | -12 | <b>7</b>     | -2           | 3                        |
| G | -14 | -9           | →- <b>4</b>  | → <b>1</b>               |

|   | Χ    | А              | T            | G                |
|---|------|----------------|--------------|------------------|
| Υ | 0 -  | <b>→-2</b>     | <b>→-4</b> - | <b>→-6</b>       |
| G | -2 - | 3<br>-1 -      | →-3          | -1               |
| G | -4   | -3             | -2           | <b>0</b>         |
| А | -6   | →-1 -          | <b>→-3</b>   | -2               |
| А | -8   | 3              | -2           | <sup>3</sup> →-4 |
| Т | -10  | -5             | ) O -        | <b>→-2</b>       |
| G | -12  | → <b>-</b> 7 - | <b>-2</b>    | 3                |
| G | -14  | -9             | -4           | 1                |

|   | X    | А                  | Т            | G                       |
|---|------|--------------------|--------------|-------------------------|
| Υ | 0 -  | <b>→-2</b>         | <b>→-4</b> - | <b>→-6</b>              |
| G | -2 - | <sup>3</sup> → 1 − | →-3          | -1                      |
| G | -4   | -3                 | <b>-2</b>    | <b>0</b>                |
| А | -6   | <b>1</b> –         | <b>→-3</b>   | <b>-2</b>               |
| А | -8   | -3                 | <b>-2</b> -  | <sup>3</sup> → <b>4</b> |
| Т | -10  | -5                 | 0 -          | <b>→-2</b>              |
| G | -12  | → <b>-</b> 7 -     | -2           | 3                       |
| G | -14  | -9                 | -4           | 1                       |

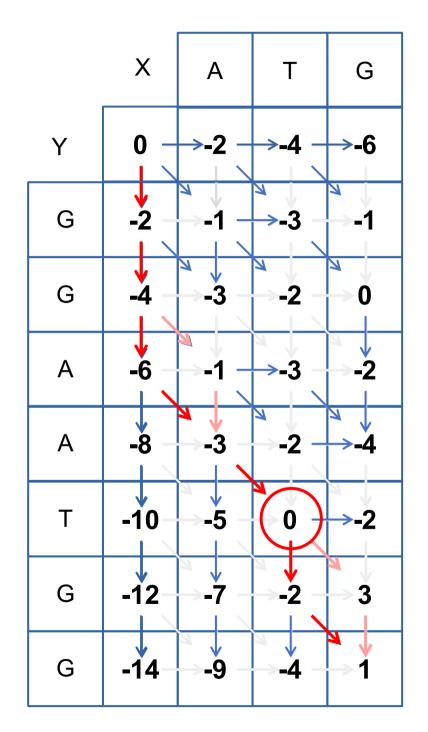
|   | Χ   | А                  | Т            | G                   |
|---|-----|--------------------|--------------|---------------------|
| Υ | 0 - | <b>→-2</b>         | <b>→-4</b> - | <b>→-6</b>          |
| G | -2  | <sup>3</sup> → 1 − | →-3          | -1                  |
| G | -4  | -3                 | <b>-2</b>    | <b>0</b>            |
| А | -6  | -1 -               | <b>→-3</b>   | -2                  |
| А | -8  | -3                 | -2           | <sup>4</sup><br>→-4 |
| Т | -10 | -5                 | 0 -          | <b>→-2</b>          |
| G | -12 | <b>7</b>           | -2           | 3                   |
| G | -14 | -9                 | -4           | 1                   |

|   | Χ   | А            | Т            | G                |
|---|-----|--------------|--------------|------------------|
| Υ | 0 - | <b>→-2</b> - | <b>→-4</b> - | <b>→-6</b>       |
| G | -2  | <sup>3</sup> | →-3          | -1               |
| G | -4  | -3           | <b>-2</b>    | <b>0</b>         |
| А | -6  | -1 -         | <b>→-3</b>   | -2               |
| А | -8  | -3           | -2           | <sup>3</sup> →-4 |
| Т | -10 | -5           | 0 -          | <b>→-2</b>       |
| G | -12 | <b>7</b>     | -2           | 3                |
| G | -14 | -9           | -4           | 1                |



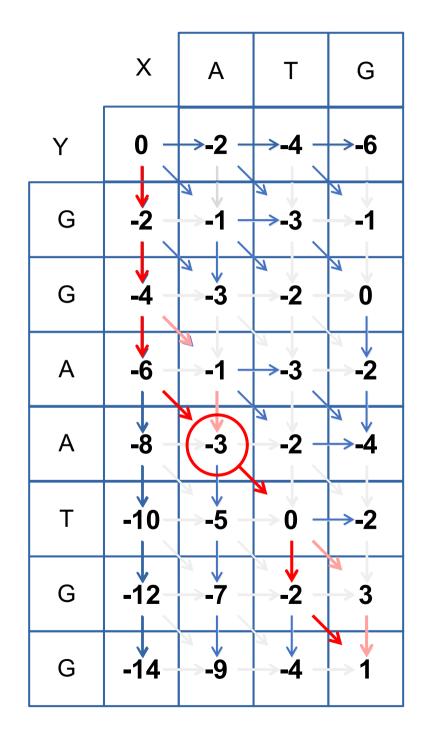
Gap = -2

X: G Y: G

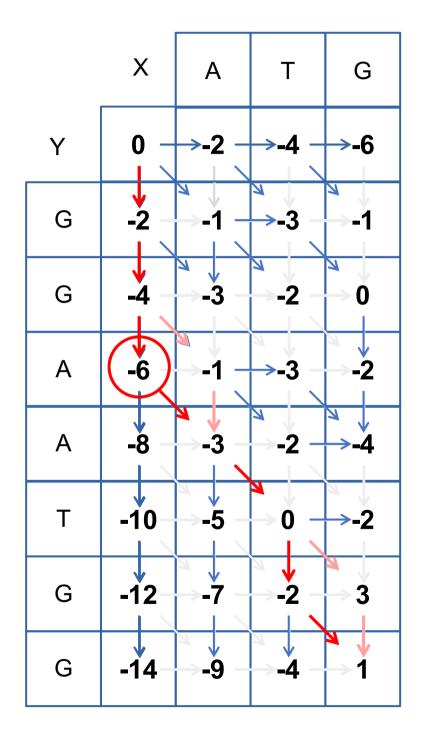


Gap = -2

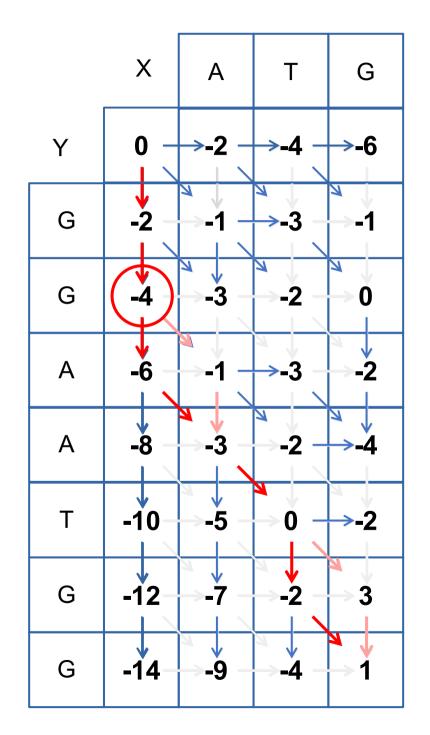
X: -G Y: GG



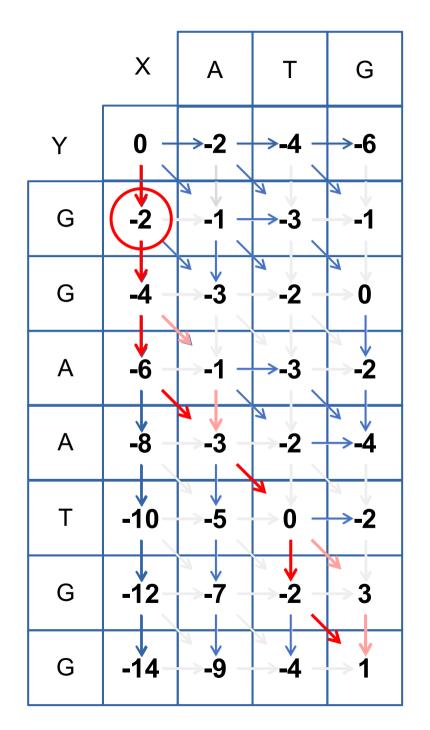
X: T-GY: TGG



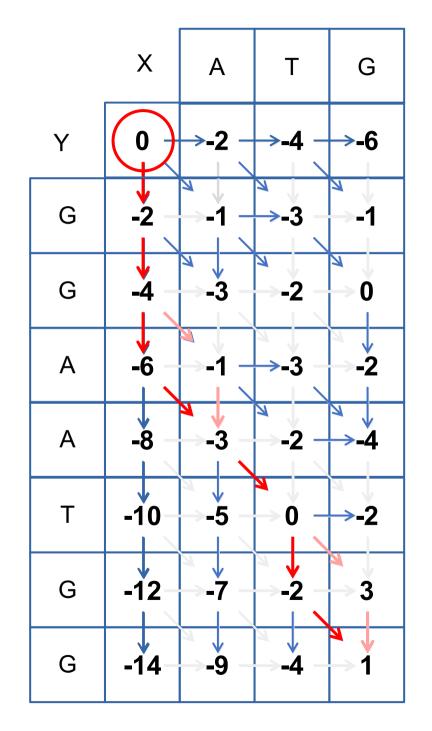
X: AT-G
Y: ATGG



X: -AT-GY: AATGG



X: --AT-G
Y: GAATGG



X: ---AT-G
Y: GGAATGG

|   | X          | А            | Т         | G          |
|---|------------|--------------|-----------|------------|
| Υ | 0 -        | →0 -         | → 0 -     | <b>→ 0</b> |
| G | <b>o</b> – | <b>0</b> –   | 0 -       | 3          |
| G | Ŏ -        | 0            | 0         | 3          |
| А | Ŏ          | 3 -          | <b>→1</b> | <b>1</b>   |
| А | Ŏ -        | 3            | 2 -       | → <b>0</b> |
| Т | Ŏ -        | → 1 —        | 6 -       | <b>→4</b>  |
| G | Ŏ -        | 0            | <b>4</b>  | 9          |
| G | Ŏ -        | <b>→ 0</b> − | <b>2</b>  | → <b>7</b> |

X: ATG Y: ATG