

COMPSCI 260 - Problem Set 3, Problem 2
Due: Fri 11 Oct 2019, 5pm

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Statement of collaboration and resources used (put None if you worked entirely without collaboration or resources; otherwise cite carefully): Office Hours, BWT web video series provided on Piazza

My solutions and comments for this problem are below.

a)

First I wrote all possible Rotations

```
ATGCCTGT$
TGCCTGT$A
GCCTGT$AT
CCTGT$ATG
CTGT$ATGC
TGT$ATGCC
GT$ATGCCT
T$ATGCCTG
$ATGCCTGT
```

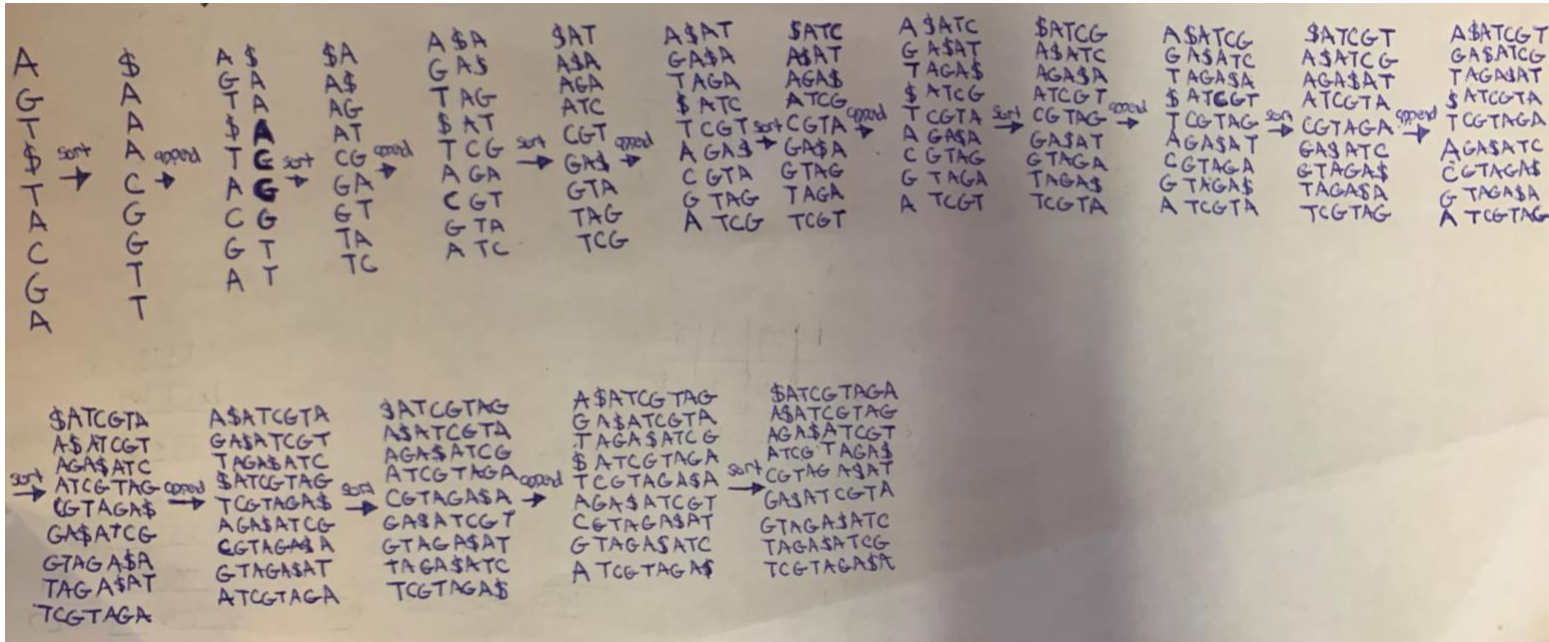
Then, I rearranged them in lexicographical order with \$ being the first character

```
$ATGCCTGT
ATGCCTGT$
CTGT$ATGC
CCTGT$ATG
GT$ATGCCT
GCCTGT$AT
T$ATGCCTG
TGT$ATGCC
TGCCTGT$A
```

I found that the last column was representative of the BWT of this series.

```
T$CGTTGCA
```

b) The “original sequence” is ATCGTAGA\$.



c) See Code

d) The forward BWT is AATTTTAAAGGGGAAA\$AAAAGGGGCCCCCCCC.

e) The output of the mystery.txt file is:

Four score and seven years ago our fathers brought forth, on this continent, a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived, and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field, as a final resting-place for those who here gave their lives, that that nation might live. It is altogether fitting and proper that we should do this. But, in a larger sense, we cannot dedicate, we cannot consecrate—we cannot hallow—this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honored dead we take increased devotion to that cause for which they here gave the last full measure of devotion—

that we here highly resolve that these dead shall not have died in vain—
that this nation, under God, shall have a new birth of freedom, and that government
of the people, by the people, for the people, shall not perish from the earth. --
Abraham Lincoln\$