Q3a.

Through following code, We could see the results ouputted at the end of code.

```
def computeBWT(s):
    s = s +'$'
    rows = sorted(s[i:] + s[:i] for i in range(len(s)))
    bwt = [row[-1:] for row in rows]
    print("".join(bwt))
    return "".join(bwt)
computeBWT('I_am_fully_convinced_that_species_are_not_immutable;_but_that_those_belonging_to_wha
t_are_called_the_same_genera_are_lineal_descendants_of_some_other_and_generally_extinct_species,
_in_the_same_manner_as_the_acknowledged_varieties_of_any_one_species_are_the_descendants_of_that
_species._Furthermore,_I_am_convinced_that_natural_selection_has_been_the_most_important,_but_no
t_the_exclusive,_means_of_modification.')
```

```
## .etsense__$.,eIIrftassrse,;emyleeymedntt,ee,fetetssssyeeelftttedfdtsetndntgdort_ercr__ss_metd
d_____vh_hhhhhcn__a___innsseeeeax__neneeeenn__eorvlhsrhhmrmhrmhhnrnmpppplcclglbsbeccgghnnnhiiiii
ddi__ooooi_nd__n_wttttttttttttfcccctrd___vvtlgttscaabelw_auaecllaa_aao_i_r_imooei_iiiaeeoineeio
a__kaaaaooatm____sii_lccmphmnn_nssssmeeeueoaaaaaeoueeeeaentta__eeo_u_____onaosaucaauoaur_________
__or_exac_nnaftFlbbm_inn_oeelln
```

Q4.

Through following code, We could see the results ouputted at the end of code.

```
def decodeBWT(r):
    rows = [""] * len(r)
    for i in range(len(r)):
        rows = sorted(r[i] + rows[i] for i in range(len(r)))
    s = [row for row in rows if row.endswith("$")][0]
    print(s.rstrip("$").strip())
    return s.rstrip("$").strip()
decodeBWT('.uspe_gexr_______$..,e.orrs,sdddeedkdsuoden-tf,tyewtktttt,sewteb_ce__ww__h_PPsm_u_nas
eueeennnrrlmwwhWcrskkmHwhttv_no_nnwttzKt_l_ocoo_be___aaaooaAakiiooett_oooi_sslllfyyD__uouuueceet
enagan___rru_aasanIiatt__c__saacooor_ootjeae______ir__a')
```

```
## We_went_up,_saw_the_structure,_we_came_back_to_Kings_and_looked_at_our_Pattersons,_and_every_
section_of_our_Pattersons_we_looked_at_screamed_at_you,_Double_Helix._And_it_was_just_there._-_o
nce_you_knew_what_to_look_for._It_was_amazing.
```