Shubham Gupta   **IME611 - Assignment 1**
180749

The following securities are Treasury Bills and various Central and State Government sector (G-sec) bonds.

Nomenclature of Treasury bills follows the number of days followed by TB (for treasury bill) and followed by the maturity date (day, month and year without preceding zeroes).

Nomenclature of government bonds follows the coupon without decimals with at least 3 significant, followed by the initials of the issuer of the bond (GOI, AP, ASSAM) and lastly the maturity year, no mention of dates and month of maturity.

The general-purpose for the issuance of these securities is the need of government to raise capital to fund various projects.

Coupon: Annual or semi-annual periodic payments at specific time intervals by the issuer of the bond. It could be zero or non-zero. For our calculations, we have assumed all the securities to pay coupons semi-annually.

Maturity: The maturity date refers to the moment in time when the principal of a fixed income instrument must be repaid to an investor.

Face Value: It is the fixed amount paid to the holder at maturity. For our calculations, we have assumed the face value of all securities to be 100.

Yield: It is the discounted rate or interest rate implied by the payment structure. It is not fixed throughout the life of the bond and is subject to credit ratings and inflation.

Price: It is the net present value of the bond with specific details on coupon, years to maturity, yield and face value. It is used by the traders to speculate the LTP of a security.

1. 364 DAYS T-BILLS

Security Code: 364TB29421
Nomenclature: 364 days Treasury Bill with the maturity date of 29th April 2021
Coupon: 0%
Maturity: 29th April 2021
FV: 100
Yield: 3.35%
Price: 99.17
LTP: 99.1800

2. 91 DAYS T-BILLS

Security Code: 91TB29421
Nomenclature: 91 days Treasury Bill with the maturity date of 29th April 2021
Coupon: 0%
Maturity: 29th April 2021
FV: 100
Yield: 0%
Price: 100
LTP: 99.1832

3. 7.16% GOI 2023

Security Code: 716GOI2023
Nomenclature: A Government of India bond with a coupon of 7.16 and maturity on 20th May 2023
Coupon: 7.16%
Maturity: 20th May 2023
FV: 100
Yield: 6.88%
Price: 98.59
LTP: 105.8000

4. 364 DAYS T-BILLS

Security Code: 364TB4321
Nomenclature: 364 days Treasury Bill with the maturity date of 4th March 2021
Coupon: 0%
Maturity: 4th March 2021
FV: 100
Yield: 3.23%
Price: 99.73
LTP: 99.7000

5. 6.87% ANDHRA PRADESH 2035

Security Code: 687AP35
Nomenclature: An Andhra Pradesh Government bond with a coupon of 6.87 and maturity date of 21st April 2035
Coupon: 6.87%
Maturity: 21st April 2035
FV: 100
Yield: 6.77%
Price: 100.25
LTP: 102.2900

6. 8.30% GOI 2040

Security Code: 0830CGOI40
Nomenclature: A Government of India bond with a coupon of 8.3 and maturity date of 7th July 2040
Coupon: 8.3%
Maturity: 7th July 2040
FV: 100
Yield: 6.89%
Price: 115.00
LTP: 119.9400

7. 182 DAYS T-BILLS

Security Code: 182TB4321
Nomenclature: 182 days Treasury Bill with the maturity date of 4th March 2021
Coupon: 0%
Maturity: 4th March 2021
FV: 100
Yield: 3.23%
Price: 99.73
LTP: 99.7000

8. 182 DAYS T-BILLS

Security Code: 182TB25321
Nomenclature: 182 days Treasury Bill with the maturity date of 25th March 2021
Coupon: 0%
Maturity: 25th March 2021
FV: 100
Yield: 3.27%
Price: 99.46
LTP: 99.5100

9. 6.83% GOI 2039

Security Code: 683GOI39
Nomenclature: A Government of India bond with a coupon of 6.83 and maturity date of 19th Jan 2039
Coupon: 6.83%
Maturity: 19th Jan 2039
FV: 100
Yield: 6.3%
Price: 105.66
LTP: 104.0100

10. 182 DAYS T-BILLS

Security Code: 182TB25221
Nomenclature: 182 days Treasury Bill with the maturity date of 25th February 2021
Coupon: 0%
Maturity: 25th February 2021
FV: 100
Yield: 3.25%
Price: 99.73
LTP: 99.7600

11. 364 DAYS T-BILLS

Security Code: 364TB25321
Nomenclature: 364 days Treasury Bill with the maturity date of 25th March 2021
Coupon: 0%
Maturity: 25th March 2021
FV: 100
Yield: 3.27%
Price: 99.46
LTP: 99.5100

12. 8.43% ASSAM 2026

Security Code: 843ASSAM26
Nomenclature: An Assam Government bond with a coupon of 8.43 and maturity date of 27th January 2026
Coupon: 8.43%
Maturity: 27th January 2026
FV: 100
Yield: 3.64%
Price: 121.72
LTP: 109.2500

13. 8.52 % KARNATAKA SDL 2028

Security Code: 852KARNATAK28
Nomenclature: A Karnataka Government bond with a coupon of 8.52 and maturity date of 28th November 2026
Coupon: 8.52%
Maturity: 28th November 2026
FV: 100
Yield: 7.79%
Price: 102.67
LTP: 113.1900

14.   8.50 % GUJARAT SDL 2028

Security Code: 850GUJRAT28
Nomenclature: A Gujarat Government bond with a coupon of 8.5 and maturity date of
28th November 2026
Coupon: 8.5%
Maturity: 28th November 2026
FV: 100
Yield: 7.78%
Price: 102.62
LTP: 113.0700

Python code for above calculations

```
c = 6 # coupon
n = 4 # number of years, could be in decimal also
y = 0.02 # yeild, in decimal
fv = 100 # face value of the bond
k = 2 # number of coupon payments, for all bonds we take it as 2

BP = (c/k)*(1-(1/(1+y/k)**(n*k)))/(y/k) + fv/((1+y/k)**(n*k)) #Present Value of Ordinary
Annuity Formula
print(BP)
```

Why do we see the difference in price and LTP?

1.) We can clearly see that when a security is close to its maturity the variations between Price and LTP are minimum and this difference could have arrived due to the difference in the tolerance in the values used by me and the traders.
2.) When the security is far from its maturity we can see huge differences in Prices and LTP. This is because of the inflation and Credit Risk
    a.) Changes in interest rates affect bond prices by influencing the discount rate. Inflation produces higher interest rates, which in turn requires a higher discount rate, thereby decreasing a bond's price.
    b.) Bonds with higher risk and lower credit ratings are considered speculative and come with higher yields and lower prices

References

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