Consumption / Leisure Model

ECO 305: Intermediate Macroeconomics
Goal: Develop a *microfounded* understanding of the following:

1. Consumption demand
2. Labor supply

Reading: Williamson, Chapter 4, pages 96-116.
A microfounded macroeconomics model shows how aggregate (macroeconomics) outcomes derive from individual optimizing (microeconomic) behavior.
Utility: quantity of satisfaction gained from consuming goods, services, or leisure.

Leisure: any time spent not working for compensation.

Marginal utility (MU): additional utility derived from one additional unit of a good, service, or leisure.
1. Marginal utility is always positive

2. **Diminishing marginal utility**: as consumption of something increases, the marginal utility decreases.

Taken together, this means that as consumption increases,

- utility *increases*,
- but at a *decreasing rate*.
Indifference curves:
Alternative bundles consisting of quantities of two types of goods that yields the same level of utility.

Indifference curves are downward sloping. Why?

Indifference curves can never cross.

Indifference curves are convex. Why?
• The **marginal rate of substitution** \( MRS_{X,Y} \): The quantity of good \( Y \) that a consumer is willing to give up to gain one more unit of good \( X \).

• Slope of the indifference curve \( = -MRS_{X,Y} \)

\[
MRS_{X,Y} = -\frac{MU_X}{MU_Y} \tag{1}
\]
Microfounded model of aggregate consumption and labor supply choices.

Consumers derive utility from two goods: consumption and leisure.

Both are normal goods.

Consumers are limited by a budget constraint.

Single period of time (no saving / borrowing).
Budget constraint

\[ P_c = W(h - l) + \Pi - T \]  

- \( P \): Price of consumption good (aggregate price level)
- \( c \): Real quantity of consumption
- \( W \): Nominal wage rate
- \( h \): total time available for work and leisure
- \( h - l \): time spent working (total employment / labor supply)
- \( \Pi \): non-wage income = dividends earned from owning stock in firms.
- \( T \): Net lump sum taxes, net of transfers
The budget constraint, in *real terms* and slightly re-arranged:

\[ c + wl = wh + \pi - t \]  \hspace{1cm} (3)

- Lowercase letters are real variables
- Goods \( c \) and \( l \) appear on LHS
- Income appears on RHS
Maximize utility subject to budget constraint.

Get on the highest indifference curve that is affordable.

Profit maximizing choice:

\[ |MRS_{l,c}| = \frac{MU_l}{MU_c} = w \]  (4)
Examples:

- Property tax cut, lump sum tax rebate, increase in asset (stock market) values
- Budget constraint makes a parallel shift outward
- Optimal choices for consumption and leisure increase.
What happens to the budget constraint?

Optimal choice for leisure is *indeterminate*.

Optimal choice for consumption increases.
Substitution effect: the effect from *only* the increase in the relative price of the good, holding constant the effect price changes have on total purchasing power.

Income effect: the effect from *only* the change in purchasing power that results from an increase in the price of a good.

What are the income and substitution effects on consumption and leisure from an increase in wage?

You must be able to explain these *intuitively* and *show graphically*. 