

DP Concepts

video
37

&

Questions



हाथ
(Motivation)

Just as metal takes shape
when struck, we too are
forged into our best selves
through hard work and
perseverance.



MIK...

cswithMIK → Twitter

Facebook

Instagram

→ code story with MIK

whatsapp → codes

with MIK

- ✓ 1-D based DP
- ✓ Grid based DP
- ✓ String based DP
- Knapsack Series
 - Digit DP
 - Game Strategy

we'll do:-

(..) RECURSION
+
MEMOIZATION
(Top Down)

(..) Bottom UP .

(..) Time & Space

Knapsack Series

(video -2)



Variants

↳ Fractional Knapsack ✓

↳ 0/1 Knapsack ✓

↳ Unbounded Knapsack ✓

Fractional Knapsack

$$\begin{array}{l} \text{Val} \\ \text{(Profit)} \end{array} = \begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ \{100, & 280, & 120\} \end{array}$$
$$\text{wt} = \{10, 40, 20\}$$



By Profit

Val/Profit Maximize

Capacity = ~~100~~

$$\text{Val (Profit)} = \{100, 280, 120\}$$

$$\text{wt} = \{10, 40, 20\}$$

A B C
 ↑ ↓
 10

B → 280

$$\text{wt}$$

$$20 \rightarrow 120$$

$$1 \rightarrow \frac{120}{20}$$

$$10 \rightarrow \frac{120}{20} \times 10 = \underline{60}$$

B → C

$$\text{Profit} = 280 + 60$$

$$= 340$$

By weight:-

Capacity = 20

$$\text{Val (Profit)} = \{100, 280, 120\}$$

$$\text{wt} = \{10, 40, 20\}$$

A B C
 ↓
 20

A → wt = 10
val = 100

C → wt = 20
val = 120

40 → 280

D → C → B

A → C → B

$$\text{Profit} = 100 + 120 + 140 = 360$$

$$1 \rightarrow \frac{280}{40, 140}$$

$$B \rightarrow 20 \rightarrow \frac{280}{20} \times 20 = 140$$

Profit Per
unit weight
(profit/wt)

(A) (B) C

$$\text{Val (Profit)} = \{100, 280, 120\}$$

$$\text{wt} = \{10, 40, 20\}$$

$$\text{Per Unit Profit} = \left\{ \underset{\uparrow}{10}, \underset{\uparrow}{7}, 6 \right\}$$

Greedy
Approach.

$$\text{Capacity} = 50 \quad 40 \quad 0$$

$$A \rightarrow \text{wt} = 10$$

$$\text{Profit} = 10 \times 10 = 100$$

$$B \rightarrow \text{wt} = 40$$

$$\text{Profit} = 7 \times 40 = 280$$

$$\text{Profit} = \frac{A.}{100} + \frac{B}{280} = 380$$

"Per unit Profit → sort".

"Greedy"

~~DP~~

Company = Microsoft.

GFG \rightarrow Fractional Knapsack.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase by 1.5 billion (United Nations 1994).

There is a growing awareness of the need to address the needs of children in the 21st century. The United Nations Convention on the Rights of the Child (1989) has been signed by 112 countries, and the United Nations has established the Committee on the Rights of the Child. The Committee has issued a series of guidelines for the implementation of the Convention, and these are being used by many countries to develop policies and programmes for children.

The United Nations has also established the World Summit on Children, which was held in 1990 in Geneva. The Summit was attended by 150 heads of state and government, and it resulted in the adoption of the Declaration on the Rights and Responsibilities of the Adolescent. This declaration sets out the rights and responsibilities of adolescents, and it provides a framework for the development of policies and programmes for adolescents.

The United Nations has also established the World Commission on the Rights of the Child, which was set up in 1991. The Commission is made up of 10 members, and it is responsible for monitoring the implementation of the Convention on the Rights of the Child. The Commission has issued a series of reports, and these have been used by many countries to develop policies and programmes for children.

The United Nations has also established the United Nations Children's Fund (UNICEF), which was set up in 1946. UNICEF is a specialized agency of the United Nations, and it is responsible for providing humanitarian and developmental aid to children in need. UNICEF has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations High Commissioner for Human Rights, who is responsible for promoting and protecting human rights. The High Commissioner has issued a series of reports, and these have been used by many countries to develop policies and programmes for children.

The United Nations has also established the United Nations Educational, Scientific and Cultural Organization (UNESCO), which was set up in 1945. UNESCO is a specialized agency of the United Nations, and it is responsible for promoting education, science, and culture. UNESCO has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations Development Programme (UNDP), which was set up in 1965. UNDP is a specialized agency of the United Nations, and it is responsible for promoting development. UNDP has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations Population Fund (UNFPA), which was set up in 1989. UNFPA is a specialized agency of the United Nations, and it is responsible for promoting population development. UNFPA has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations World Food Programme (WFP), which was set up in 1961. WFP is a specialized agency of the United Nations, and it is responsible for providing food aid to people in need. WFP has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), which was set up in 1991. OCHA is a specialized agency of the United Nations, and it is responsible for coordinating humanitarian aid. OCHA has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

The United Nations has also established the United Nations Children's Emergency Fund (UNICEF), which was set up in 1946. UNICEF is a specialized agency of the United Nations, and it is responsible for providing humanitarian and developmental aid to children in need. UNICEF has a long history of working with children, and it has a wide range of programmes and services that are aimed at improving the lives of children.

the 1990s, the number of people in the world who are under 15 years of age has increased by 1.2 billion, from 1.1 billion in 1980 to 2.3 billion in 1999. The number of people aged 15 years and over has increased by 1.5 billion, from 2.5 billion in 1980 to 4.0 billion in 1999.

There are a number of reasons why the world population is growing so rapidly. One of the main reasons is that the number of children born to each woman has increased. In 1980, the average woman in the world had 2.5 children. In 1999, the average woman in the world had 2.8 children.

Another reason why the world population is growing so rapidly is that the number of people who are surviving to old age has increased. In 1980, the average person in the world lived for 55 years. In 1999, the average person in the world lived for 65 years.

There are a number of reasons why the number of people who are surviving to old age has increased. One of the main reasons is that the number of people who are surviving to old age has increased. In 1980, the average person in the world lived for 55 years. In 1999, the average person in the world lived for 65 years.

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