

Assignment 6: Dynamic Programming Challenge

Project Resource Allocation

You are a project manager at a tech company with a limited budget. You have a list of potential projects, each with an associated cost and expected return on investment (ROI). Your task is to determine which projects to fund to maximize the total ROI without exceeding your budget.

Function Signature:

```
function maximizeROI(budget, projects)
```

Parameters:

budget (number): The total budget available in dollars

projects (array of objects): Each object has:

- name (string): Project name
- cost (number): Cost to fund the project
- roi (number): Expected return on investment

Returns:

An object with:

- maxROI (number): Maximum achievable ROI
- selectedProjects (array of strings): Names of selected projects

Example 1:

```
const budget1 = 10000; const projects1 = [  {
name: "AI Chatbot", cost: 5000, roi: 8000 },
  { name: "Mobile App", cost: 4000, roi: 6000 },
  { name: "Website Redesign", cost: 3000, roi: 4000 },
  { name: "Cloud Migration", cost: 6000, roi: 9000 }
]; // Expected
```

Output:

```
// { maxROI: 14000, selectedProjects: ["AI Chatbot", "Mobile App"] }
```

Example 2:

```
const budget2 = 15000; const projects2 = [  {
name: "CRM System", cost: 8000, roi: 12000 },
  { name: "Analytics Tool", cost: 5000, roi: 7000 },
  { name: "Security Upgrade", cost: 7000, roi: 10000 },
{ name: "API Development", cost: 4000, roi: 5000 }
]; // Expected

Output:
// { maxROI: 22000, selectedProjects: ["CRM System", "Security Upgrade"] }
```