

 Welcome to Smart Shopping Planner!

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Dataset file data/food_nutrition_dataset.csv not found. Creating sample dataset...

Preprocessing Kaggle nutritional dataset...

Standardized columns: ['name', 'category', 'calories', 'protein', 'carbohydrates', 'fat']


Applied column mapping: {'name': 'name', 'category': 'category', 'calories': 'calories', 'protein': 'protein', 'carbohydrates': 'carbohydrates', 'fat': 'fat'}

Mapped columns: ['name', 'category', 'calories', 'protein', 'carbohydrates', 'fat']

Dataset after preprocessing: 38 items

Processed dataset: 38 items with 7 features

Loaded 38 food items from dataset

 Creating your Smart Shopping Plan...

Applying dietary restrictions: ['vegetarian']

Vegetarian filter applied: 35 items remaining

Final filtered dataset: 35 items

 Phase 1: Applying Greedy Algorithm for cost optimization...

Starting greedy selection with budget: \$150.0

Selected: Bell Peppers – \$0.25 (ratio: 0.022, remaining budget: \$149.75)

Selected: Sweet Potato – \$0.75 (ratio: 0.025, remaining budget: \$149.00)

Selected: Quinoa – \$2.00 (ratio: 0.026, remaining budget: \$147.00)

Selected: Olive Oil – \$8.00 (ratio: 0.029, remaining budget: \$139.00)

Selected: Butter – \$7.00 (ratio: 0.031, remaining budget: \$132.00)

Selected: Pasta – \$2.50 (ratio: 0.032, remaining budget: \$129.50)

Selected: Black Beans – \$2.75 (ratio: 0.033, remaining budget: \$126.75)

Selected: Coconut Oil – \$10.50 (ratio: 0.039, remaining budget: \$116.25)

Selected: Cheese (cheddar) – \$5.75 (ratio: 0.043, remaining budget: \$110.50)

Selected: Brown Rice – \$3.50 (ratio: 0.046, remaining budget: \$107.00)

Selected: Whole Wheat Bread – \$4.75 (ratio: 0.054, remaining budget: \$102.25)

Selected: Granola – \$10.00 (ratio: 0.062, remaining budget: \$92.25)
Selected: Almonds – \$13.75 (ratio: 0.072, remaining budget: \$78.50)
Selected: Garlic – \$4.00 (ratio: 0.074, remaining budget: \$74.50)
Selected: Tomatoes – \$0.50 (ratio: 0.076, remaining budget: \$74.00)
Selected: Avocado – \$4.00 (ratio: 0.077, remaining budget: \$70.00)
Selected: Greek Crackers – \$3.50 (ratio: 0.084, remaining budget: \$66.50)
Selected: Tofu – \$2.25 (ratio: 0.090, remaining budget: \$64.25)
Selected: Walnuts – \$19.75 (ratio: 0.093, remaining budget: \$44.50)
Selected: Bananas – \$3.25 (ratio: 0.102, remaining budget: \$41.25)
Selected: Onions – \$1.50 (ratio: 0.106, remaining budget: \$39.75)
Selected: Chia Seeds – \$18.00 (ratio: 0.110, remaining budget: \$21.75)
Selected: Frozen Vegetables – \$2.75 (ratio: 0.118, remaining budget: \$19.00)
Selected: Blueberries – \$2.50 (ratio: 0.124, remaining budget: \$16.50)
Selected: Strawberries – \$1.50 (ratio: 0.130, remaining budget: \$15.00)
Selected: Oranges – \$2.25 (ratio: 0.133, remaining budget: \$12.75)
Selected: Apples – \$2.50 (ratio: 0.135, remaining budget: \$10.25)
Selected: Carrots – \$2.00 (ratio: 0.136, remaining budget: \$8.25)
Selected: Broccoli – \$1.75 (ratio: 0.136, remaining budget: \$6.50)
Selected: Spinach – \$1.50 (ratio: 0.168, remaining budget: \$5.00)
Selected: Frozen Berries – \$4.25 (ratio: 0.171, remaining budget: \$0.75)

Greedy Algorithm Results:

Items selected: 31

Total cost: \$149.25

Budget utilization: 99.5%

Average cost-nutrition ratio: 0.083

🎯 Phase 2: Applying Dynamic Programming for nutritional optimization...
Starting Dynamic Programming optimization with budget: \$150.0
Nutritional goals: {'min_calories': 2000, 'min_protein': 50, 'min_carbs': 250, 'min_fat': 65}
DP selected 28 items with total value optimization

🕒 Phase 3: Applying Heap Management for expiration optimization...

Added expiration dates to 32 items
Prioritizing 32 items by expiration date using heap

🚨 URGENT: Tomatoes expires in 1 days
🚨 URGENT: Blueberries expires in 2 days
🚨 URGENT: Oranges expires in 2 days
🚨 URGENT: Spinach expires in 2 days
🚨 URGENT: Sweet Potato expires in 3 days
🚨 URGENT: Avocado expires in 3 days

⚠️ Soon: Butter expires in 4 days
⚠️ Soon: Bananas expires in 4 days
⚠️ Soon: Whole Wheat Bread expires in 4 days
⚠️ Soon: Strawberries expires in 5 days
⚠️ Soon: Apples expires in 6 days
⚠️ Soon: Cheese (cheddar) expires in 7 days
⚠️ Soon: Bell Peppers expires in 7 days

Heap prioritization complete. 6 urgent items identified.

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🎉 YOUR OPTIMIZED SMART SHOPPING PLAN

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💰 Budget Analysis:
Total Cost: \$171.25
Budget Used: 114.2%

🥗 Nutritional Summary:
Total Calories: 7959
Total Protein: 202.7g
Daily Avg Calories: 1137
Daily Avg Protein: 29.0g

Shopping Schedule:

Day 1 (High Priority) – \$6.75:

- Tomatoes – \$0.50 (expires in 1 days)
- Blueberries – \$2.50 (expires in 2 days)
- Oranges – \$2.25 (expires in 2 days)
- ... and 1 more items

Day 2 (High Priority) – \$15.00:

- Sweet Potato – \$0.75 (expires in 3 days)
- Avocado – \$4.00 (expires in 3 days)
- Butter – \$7.00 (expires in 4 days)
- ... and 1 more items

Day 3 (Medium Priority) – \$14.50:

- Whole Wheat Bread – \$4.75 (expires in 4 days)
- Strawberries – \$1.50 (expires in 5 days)
- Apples – \$2.50 (expires in 6 days)
- ... and 1 more items

Day 4 (Medium Priority) – \$7.75:

- Bell Peppers – \$0.25 (expires in 7 days)
- Carrots – \$2.00 (expires in 8 days)
- Garlic – \$4.00 (expires in 10 days)
- ... and 1 more items

Day 5 (Medium Priority) – \$28.75:

- Broccoli – \$1.75 (expires in 10 days)
- Black Beans – \$2.75 (expires in 20 days)
- Tofu – \$2.25 (expires in 21 days)
- ... and 1 more items

Day 6 (Medium Priority) – \$54.25:






- Walnuts – \$19.75 (expires in 41 days)
- Chia Seeds – \$18.00 (expires in 61 days)
- Frozen Vegetables – \$2.75 (expires in 97 days)
- ... and 1 more items

Day 7 (Medium Priority) – \$44.25:


- Greek Crackers – \$3.50 (expires in 112 days)
- Granola – \$10.00 (expires in 122 days)
- Brown Rice – \$3.50 (expires in 166 days)
- ... and 5 more items




Waste Reduction Tips:

-  Priority: Use 6 items within 3 days to avoid waste
-  Store 16 perishable items properly (refrigerate fruits/vegetables)
-  17 Plan meals around expiration dates
-  Consider freezing items you won't use immediately
-  Update your shopping list based on what you actually consume

✂ Algorithm Performance:
Greedy: 31 items selected
Dynamic Programming: 28 items optimized
Heap Management: 6 urgent items prioritized

 Generating visualizations...
Creating visualizations...

 Plan saved to 'output/shopping_plan.json'