

VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



Software Project Management

(CO3012)

LAB 1 - 27 Sep 2022

NEW LIBRARY SYSTEM

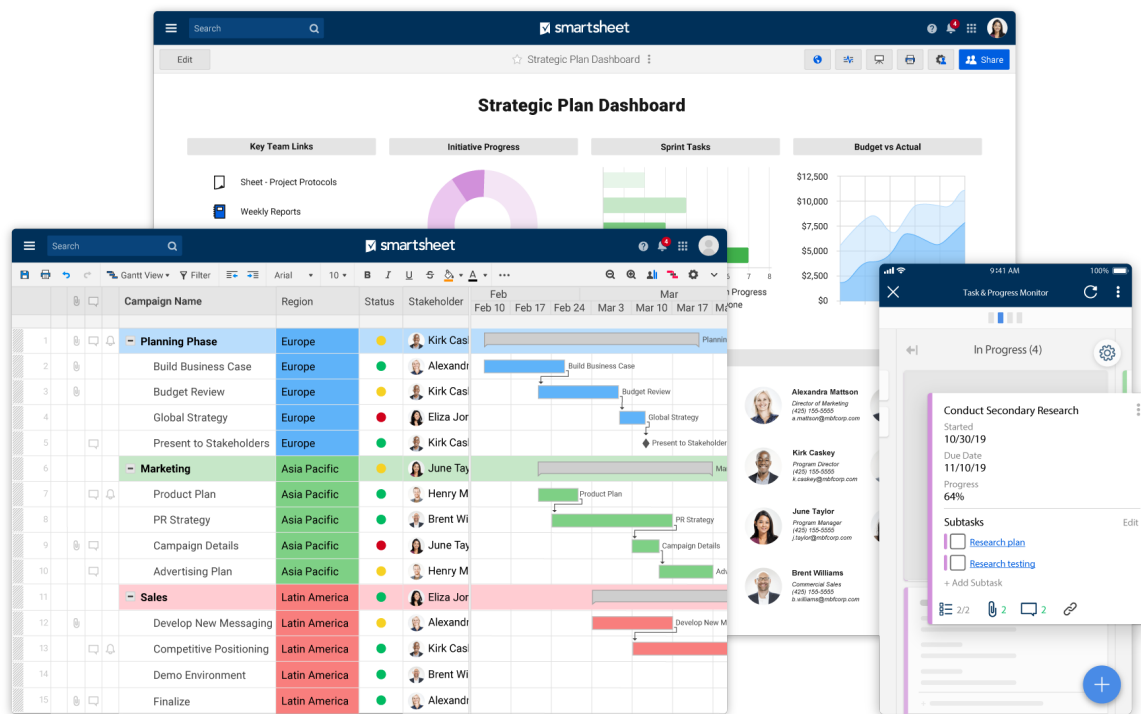
Instructor: Mai Duc Trung
Students: Luu Trinh Lam - 1952315

LAB 1: Project launch

Exercise 1: Learn some open sources that support project management similar to MS Project. Although MS Project is one of the most popular software for connecting team's tasks and planning for projects, there are some alternatives out there. Here are some of them:

1. SmartSheet

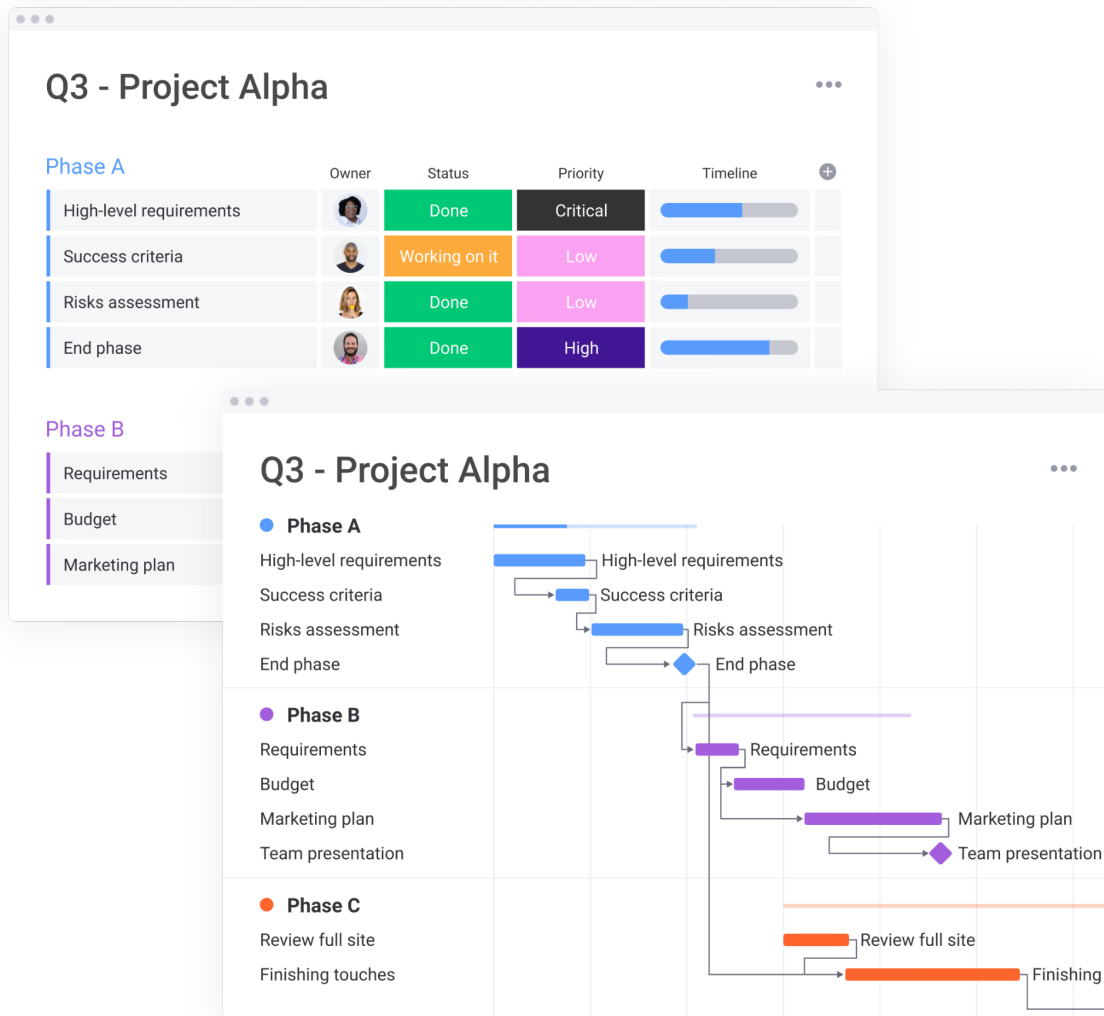
Smartsheet is a software used to assign tasks, track project progress, manage calendars, share documents, and manage other work, using a tabular user interface as a service offering for collaboration and work management.



From their website, Smartsheet confirms that it is the only platform that can scale from a single project to end-to-end work management, connecting business on a no-code, cloud-based platform where anyone can create the solution they need — backed by the control and security IT requires.

2. monday.com

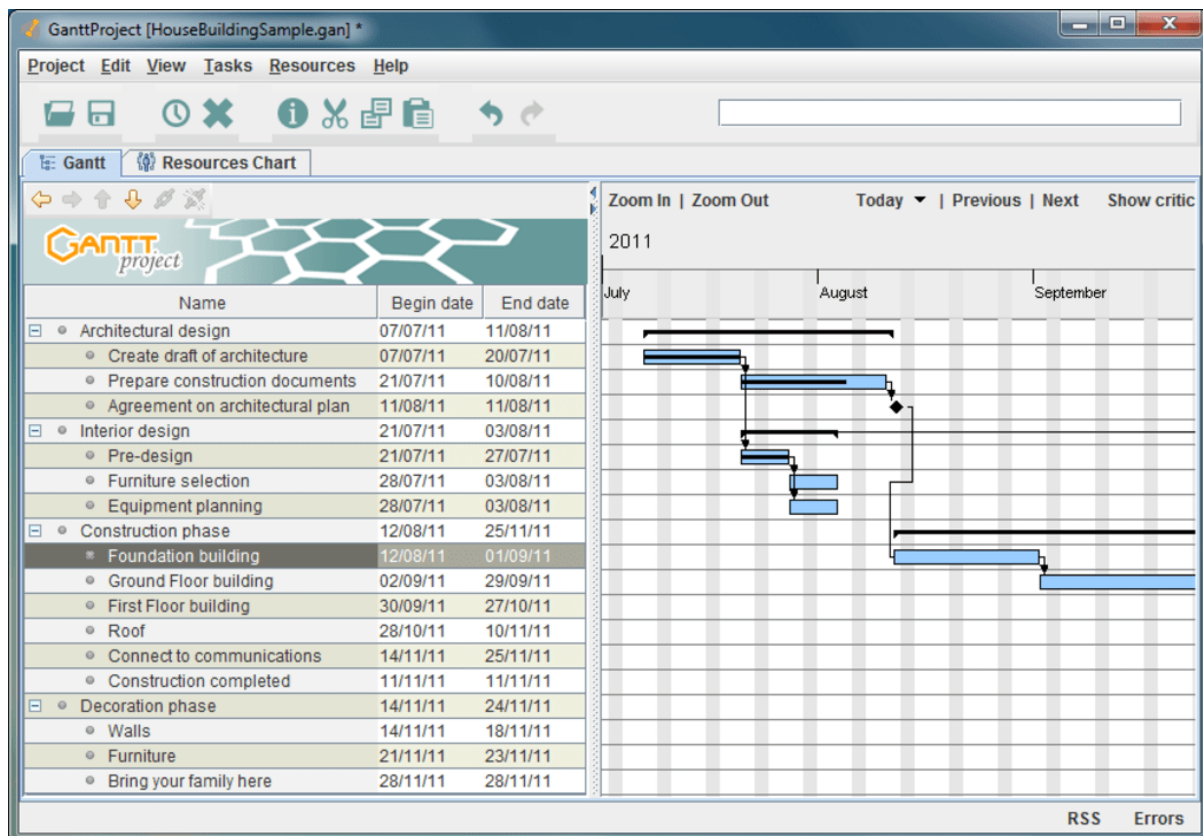
monday.com Work OS is far more than a project management tool. It is an intuitive platform that helps transform the way teams work together, meet deadlines, and build a culture of transparency.



There are many ways to manage a single project in monday.com. It can shape your workflow the way that works for your team - for any project, process, department, or customer. Best things about monday.com are prioritizing what is the most important to your team, setting project timeline, milestones and dependencies and managing your team's entire workload all in one place.

3. *GanttProject*

GanttProject was born in 2003 and has published countless maintenance and major updates since that time. In 2022, GanttProject still can open documents produced years ago. It is a cross-platform desktop tool for project scheduling and management. It runs on Windows, Linux and MacOSX, it is free and its code is open source.



Some key points about GanttProject

- Keyboard friendly : can do many things with the keyboard without using the mouse.
- Easy to Use : Learning curve is very low.
- Clean design : may not be a beautiful UI but neat and clean.

Exercise 2: Suppose you are a Project Manager. Create a Project and set a schedule for each team member. **(Library management system)**

1. Diagnose the old system:
 - 1.1. Perform surveying on regular readers at the library
 - 1.2. Analyze surveys and look into the problem
 - 1.3. Investigate employees (librarian, IT specialist, head of library)
 - 1.4. Measure the performance of the old servers
 - 1.5. Meeting with Head of Library to report the old system
2. Come up with possible solutions (listing out requirements):
 - 2.1. Scale up the system (storage for physical books, ...)
 - 2.2. Come up with new functionalities to benefit the actors:
 - 2.2.1. E-books (rental and trial mode)
 - 2.2.2. Auto generating reports
 - 2.2.3. Auto tracking progress
 - 2.3. Meeting: Suggest new features to Client
3. Design the system:
 - 3.1. Design diagrams:
 - 3.1.1. Use-case diagram
 - 3.1.2. Low-level sequence diagram
 - 3.1.3. High-level sequence diagram
 - 3.1.4. Class diagram

- 3.1.5. Deployment diagram
- 3.2. Design user interface/ user experience
 - 3.2.1. Try to extend the old interface's structure by adding more pages (i.e: ebook rental page for readers, progress-tracking page for Head of Library, ...)
 - 3.2.2. If unable to do so, come up with a new wireframe
 - 3.2.3. Meeting: Update the mockup to Client.
- 3.3. Design the server:
 - 3.3.1. Extend the old storage
 - 3.3.2. Design new databases for library's Ebook system
- 3.4. Design the infrastructure:
 - 3.4.1. Renew the old one (faster network, better PCs, ...)
 - 3.4.2. Decide which components of the system to move into cloud system for scalability and better load handling
 - 3.4.3. Meeting: Suggest improvements for infrastructure to Client.
- 4. Implementation:
 - 4.1. Front-end:
 - 4.1.1. Implement UI:
 - 4.1.1.1. E-book
 - 4.1.1.1.1. E-book list page
 - 4.1.1.1.2. E-book detail page
 - 4.1.1.1.3. Reading ebook UI
 - 4.1.1.1.4. Request / Approve e-book rental dialog
 - 4.1.1.2. Management system
 - 4.1.1.2.1. Auto-generated Report page
 - 4.1.1.2.2. Work progress insights
 - 4.1.2. Routing URL
 - 4.1.3. Integrate APIs from Back-end
 - 4.1.4. Testing
 - 4.1.4.1. Snapshot test
 - 4.1.4.2. Unit test
 - 4.1.4.3. End to end test
 - 4.1.4.4. Overall Coverage and test report: meeting with QA
 - 4.2. Back-end:
 - 4.2.1. Create new databases
 - 4.2.1.1. A bigger database compared to the old one for migrating old data
 - 4.2.1.2. A database for ebook management system
 - 4.2.2. Establish connection with databases (the newly created ones)
 - 4.2.3. Migrate the old data
 - 4.2.4. Update the databases' schemas for new requirements
 - 4.2.5. Integrate old services
 - 4.2.6. Create services/endpoint for front-end:
 - 4.2.6.1. E-book:
 - 4.2.6.1.1. List ebooks
 - 4.2.6.1.2. View ebook detail
 - 4.2.6.1.3. Read ebook in trial mode
 - 4.2.6.1.4. Request ebook rental
 - 4.2.6.1.5. Approve ebook rental requests
 - 4.2.6.2. Management system:

- 4.2.6.2.1. List auto-generated reports
 - 4.2.6.2.2. View employees' work progress
 - 4.2.6.3. Storage:
 - 4.2.6.3.1. Request stocking more books
 - 4.2.6.3.2. Track book delivery progress
 - 4.2.7. Test
 - 4.2.7.1. Unit test - Structural test
 - 4.2.7.2. End-point test - Functional test
 - 4.2.7.3. Database Server validation
 - 4.2.7.4. Overall Coverage and test report: meeting with QA
- 5. Deployment:
 - 5.1. Packaging all the code
 - 5.2. Setting up hosting service
 - 5.3. Test the connection to the web
 - 5.4. Test stability and speed of the web
 - 5.5. Meeting with Client to gain feedback for successful release
- 6. Hand over the system to Client (Head of Library)
 - 6.1. Prepare user manual docs
 - 6.1.1. IT department
 - 6.1.2. Librarian
 - 6.1.3. Head of Library
 - 6.2. Demo and showing reports of the system
 - 6.2.1. Organize knowledge sharing sessions for staffs (IT, Librarian, Head of Library, HR)
 - 6.2.2. Transfer codebase ownership
 - 6.2.3. Meeting with Head of Library to announce the final system
 - 6.3. Prepare maintenance plan
 - 6.3.1. System checkup every 6 months
 - 6.3.2. Planning for recurring training about security for the library system

LESSON 2: Planning tasks of the Project

Exercise 1: Write a Project Charter and Scope statement:

Project Charter:

- Definition:
 - A project charter states the scope and objectives of a project, as well as the people who will participate in it (stakeholders)
 - Contains most beneficial information about the project to serve as a truthful source of reference
- Outline: A project charter usually has these categories whether altered a bit or not:
 - A brief introduction justifying the project to the business
 - Statement of the project objectives
 - List of high-level project requirements (time, quality, scope and budget)
 - Description of what the end product should be like
 - Known project risks and problems
 - Milestones to meet (including end dates)
 - Expected budget of the project
 - List of stakeholders
 - List of critical success factors
 - Table showing the names and responsibilities of all on the project team

Project Scope:

- Definition:
 - A project scope statement takes the scope from the charter and expands on it.
 - It's essential that this is done collaboratively with the project team.
 - The audience for this is mainly the team (it's also useful when reporting to stakeholders).
- Outline:
 - What are the project deliverables?
 - What constraints are in place? (team members, technical abilities, ...)
 - What assumptions are we making about how well things will go? (Prerequisites)
 - What are the risks to the project? Is there a project member with a highly specialized skill? What happens if they leave? Do we rely on another team delivering their project first?
 - What is out of scope?

Differentiate between **Project Charter and Scope statement** : the charter contains an overview of the project scope and the project scope statement breaks it down into more detail

Use-case study: Question 2 in lesson 1

1) Project charter:

a) Overview:

- i) Project name: HCMUT Library management system

- ii) Project charter author: HCMCS-dev
- iii) Creation date: October 10th, 2022
- iv) Installation requestor: HCMUT Library department

b) Details:

- i) Description: Web application which upgrades from old HCMUT library including new online rental system, e-book platform and membership features
- ii) Purpose:
 - (1) Fit the need of newer generation of students (online reading rather than borrowing books)
 - (2) alleviate problems of website's performance which is reportedly downgraded
 - (3) Aim to be more user-friendly than the older one
- iii) Outcomes:
 - (1) Provide user better engagement with HCMUT's library system (more friendly and simplified interface)
 - (2) Encourage students to study more (more books and ebooks)
- iv) Project risks and problems:
 - (1) Technical aspects:
 - (a) Developer team: experienced technical leader may be hard to find (not everyone are attracted to this project)
 - (b) Extension or re-implementation: require distilled opinions (re-implementation can risk breaking the whole system if not careful, on the other hand, extension without consideration will make it hard to abstract the system thus worsen everything and hard to fix)
 - (2) Financial aspects:
 - (a) Infrastructure: there are unavoidable cost to upgrade the storage (the older one is no longer capable of storing much more data), furthermore the system aged noticeably so faster server might be in demand
 - (b) Development cost:
 - (i) Development team:
 - 1. In case there is a shortage of developers:
 - a. There will be needs for interns and junior developers.
 - b. This is double-edged since they are cheap workforces but require training and are prone to errors (new to work and appalled by the complexity of the project).
 - c. Therefore, this potentially costs more than expected (in the worst case scenario, the whole process is screwed up and re-done again which results in exponentially high cost)

2. In the other case, developers are expensive by default, so it is safe to assume that hiring them can cost the fortune
- (3) Time: in the span of 4 months maximum, longer time span means more cost
- v) Milestones:
 - (1) Diagnose the old system (1 week - October 17th, 2022)
 - (2) Come up with possible solutions (0.5 week - October 20th, 2022)
 - (3) Design the system (2 weeks - November 3rd, 2022)
 - (4) Implementation (6 weeks - December 15th, 2022)
 - (5) Deployment (2 weeks - December 29th, 2022)
 - (6) Hand over the system to Client (employee training phase) (1 week - January 5th, 2023)
- vi) Budget: ~1 billion VND
- vii) Stakeholders: librarian, IT specialist, head of library, developers and project manager
- viii) Project team:
 - (1) Project manager: Ta Gia Hung
 - (2) ...
 - (3) ...
 - (4) ...

2) Project scope statement: (not done here)

- a) Deliverables:
 - i) Library management website with all the functionalities listed in the functional requirements (tested end-to-end)
 - ii) Documentation on how to use it (for employees and users)
 - iii) Documentation on how to maintain and fix the system in case of breakdown and errors (for IT specialists)
 - iv) Newer and more robust infrastructure (better network, ...)
- b) Exclusions:
 - i) Rent physical books on the website.
 - ii) Outsiders rent ebooks on the website (don't have an account).
 - iii) Overdue physical books
- c) Assumptions:
 - i) Funding will be available when required
 - ii) Staffs will not be reassigned in the process
 - iii) Workspace will be provided for the whole process
- d) Constraints
 - i) The website will be launched at the beginning of January
 - ii) Budget
 - iii) Time/ resources/ personnel limitations

Exercise 2: Giving the following task types:

- **You celebrate a birthday or a death anniversary at home. Make a plan to see what tasks will be, how many people are required to work, and how much it costs.**

1. **Overview:** A birthday is kind of an important day for everyone. We have about 10 people to participate in this activity. We will prepare for it and it costs about .
2. **Plan :**
 - **Site selection (no cost) :** Choosing place to celebrate the birthday party will affect the the party environment, so we need to take consideration about these factors:
 1. Weather condition : Inside the house is more comfortable with the frequent rain.
 2. Number of people : family with friends 10 people.
 3. Outdoor activity or indoor activity : both
 - **Preparations (5 people):**
 1. Cleaning the house and decorating the house for the party (200k).
 2. Buying food and drink about (200k/person => 2000k).
 3. Birthday cake (500k).
 4. Indoor firework(100k).
 5. Coal for outside bbq parties (50k).
 6. Ballon for decorating house (50k).
 7. Ice and Cigaret(100k).
 - **Activities**
 1. Having dinner
 2. Playing music and dance
 3. Indoor firework and birthday cake celebrating
 4. Chatting
3. **Total cost:** about 3 000 000 VND (300 000 VND per person)

- **Your family organizes a picnic or camping. Make a plan to see what tasks will be, how many people are needed, and how much it costs.**

1. Overview:

Having a camping or picnic is an exciting and entertaining thing to do. In order to have a rewarding experience, a good plan is indeed necessary.

2. Plan:

- 2.1: Site selection

Choosing a camping or picnic location is utmost important as it will affect camping experience tremendously, choosing a site takes a variety of factors into consideration:

- Camping experience: novice
- Location distance: closer distance lowers the travel cost.
- Number of people: family with friends and neighbors, 15 people.
- Safety level: established camps or national theme parks have lower risks than those of more remote locations.

With these factors in mind, the ideal location can be Tan Lap floating village.

- 2.2: Date selection:

- Create a vote pool for a suitable date, if there is a choice of majority, select the day. In this scenario, the duration can be 2 days.

2.3: Booking in advance:

- Because the village site is free of charge, there will be no cost for renting a campsite.

2.4: Preparations (5 people):

- Tents renting: 4 tents of 4 people for 2 days $((80k + 40k) * 4 = 480k)$
- Camping mattress renting: quantity: 2, $((20k + 10k) * 2 = 60k)$
- Cooking stove renting: 180k for 2 days
- Cooking set: self-brought, no cost.
- Fuel: 100k
- Ice carrier: self-brought, no cost.
- Flashlight: no cost.
- Sleeping bags: $40k * 15 = 600k$
- First-aid kit: 600k

2.5: Activities:

- Tents build: 3 people per tent
- Set up cooking place: 3 people
- Attendance check: 1 people

2.6: Food preparation (3 people):

- Food: meat, vegetables, fruits, sweets: $200k/person = 3m$
- Water: $20k/person = 300k$

2.7: Site cleaning (15 people)

- All members will take part to tidy up the camp site, as it will save a considerable amount of time.

2.8: Transportation

Booking bus: $200k/person = 3m$

2.9: Cost incurred:

There will be unknown factors that make cost increase: $100k/person = 1.5m$

3. Total cost: 9,820,000đ

4. Cost per person: $9,820,000 / 15 = 655k$

- Your company organized a 2-day trip to Vung Tau. Make a plan to determine the tasks and estimate the cost per person.

Overview:

Vung Tau is about 125 kilometers from Ho Chi Minh City. 2 days is kind of short to explore Vung Tau, but enough if we have a clear plan. We will go with about 30 people in 2 days and 1 night.

Plan: including tasks and cost

■ Route selection

Vung Tau possesses a variety of attractions, such as the Front Beach, be Back Beach, Jesus Christ statue, Hon Ba isle and many more

For a company of 30 people, the majority of activities will happen on the beach, along with some sightseeing in famous places. Therefore, the route can be as followed:

- Day 1: Arrive at hotel, having lunch and rest, having activities on the beach in the afternoon

- Day 2: Go sightseeing in the morning, team building activities on the beach in the afternoon
- Date selection: Create a vote pool for a suitable date, if there is a choice of majority, select the day. In this scenario, the duration is 2 days.
- Booking in advance:
 - Hotel book: (1 person): \$10/1 person/ day => \$600
- Preparations:
 - Swimsuits: self-brought
 - Sunscreen: self-brought
 - Beach mat: \$3 per mat, 30 people requires at least 10 mats => \$30
 - First-aid kit: \$30
 - Personal stuffs: self-brought
- Activities:
 - Team building activities: 20 people
 - Sightseeing
 - Attendance check: 1 people
- Food preparation (3 people):
 - Food (snacks, lunch and dinner): \$15 per person => \$300
 - Water: 20k/person = \$30
- Site cleaning (30 people):
All members will take part to tidy up the camp site, as it will save a considerable amount of time.
- Transportation
Booking bus: \$10/person = \$300
- Cost incurred:
There will be unknown factors that make cost increase: \$5 /person = \$150
Total cost: \$1590
Cost per person: \$1590 / 30 = \$53
- Your class has a year-end party or a picnic. Make a plan to see what tasks will be, how many people are required to work, the duties of each person, and how much each person must pay.

Overview

Suppose it is the end of 2022 and for the whole year your class did a really great work. 20 people are going to join our picnic. Our plan is to go to Ba Den mountain and enjoy it there. It is about 110km from Saigon. This venue also allows us to hike and have a picnic altogether.

Planning

Plan: including tasks and cost

- Route selection: Ba Den mountain has many routes, so it is wise to ask the tour guide to lead the way.
- Date selection: Create a vote pool for a suitable date, if there is a choice of majority, select the day. In this scenario, the duration is 2 days.
- Booking in advance:
 - Hotel book: (1 person): \$10/1 person/ day => \$400
- Preparations (4 people)
 - Hiking tools: \$50
 - Sunscreen: self-brought
 - First-aid kit: \$30
 - Bug, insect repellent: \$4

- Personal stuffs: self-brought
- Rent a tour guide: \$50 a day => \$100
- Tents renting: 5 tents of 4 people for 2 days $((\$4 + \$2) * 5 = \$30)$
- Camping mattress renting: quantity: 2, $((\$1 + \$0.5) * 2 = \$3)$
- Cooking stove renting: \$9 for 2 days
- Cooking set: self-brought, no cost.
- Fuel: \$5
- Ice carrier: self-brought, no cost.
- Activities:
 - Tents build: 3 people per tent
 - Set up cooking place: 3 people
 - Hiking
 - Cable car travel: \$4 per person => \$80
 - Team building activities
 - Sightseeing
 - Attendance check: 1 people
- Food preparation (3 people):
 - Food (snacks, lunch and dinner): \$15 per person => \$450
 - Water: \$1/person = \$20
- Site cleaning (20 people):

All members will take part to tidy up the camp site, as it will save a considerable amount of time.
- Transportation

Booking bus: \$2.5/person = \$50
- Cost incurred:

There will be unknown factors that make cost increase: \$5 /person = \$100

Total cost: \$1331

Cost per person: $\$1331 / 20 = \66.53

Your class does charity at a Center for the lonely elderly or provides relief in flood-hit areas. Make a plan to see what tasks will be, how many people are required to work, and how much it costs.

- **Overview**

On the trip to do charity at the Center for the lonely elderly, 10 students of our class and the teacher are in charge. They take responsibility for the whole class to make some impact on the place where we are living. The charity will start from the morning till the afternoon and we have raised some money, about 5 million VND. The center has about 15 to 20 lonely elders.
- **Planning:**
 - **Date Selection** : Saturday or Sunday because all of us are students. So we will have weekends for this activity..
 - **Preparation** :
 - Food and drink (2000k)
 - Hire Musical instruments (500k)
 - Decorating stuffs (500k)
 - **Activities**

- 1 Cleaning tree downfall
- 2 Supply food and drink(3500k).
- 3 Tai-chi exercise activity.
- 4 Cooking exercise in the afternoon (400k).
- 5 Dancing and group talking in the evening .

- **Transportation:**

Bus : 5k/person => 100k

Cost incurred:

There will be unknown factors that make cost increase: 50k /person = 500k.

- Total cost: 5 000 000 VND (500 000 per person)

