

A company has four projects for the evaluation using the cash flow estimates. The relevant information of the four projects is shown in the following table. Negative values represent expenditure and positive values indicate income. Please answer the following questions with explanations according to the given information.

Year	Project A	Project B	Project C	Project D
0	\$-10000	\$-100000	\$-10000	\$-12000
1	\$-1000	\$20000	\$3000	\$3000
2	\$-1000	\$20000	\$3000	\$3000
3	\$-1000	\$20000	\$3000	\$3000
4	\$-2000	\$20000	\$3000	\$3000
5	\$10000	\$30000	\$3000	\$7500

1. Assuming a 10% discount rate, calculate the net present value for each of the four projects, and decide which, on the basis of this criterion, is the most beneficial to pursue. Note: Please keep two decimals for the value of the discount factor in calculations.

2. Calculate the payback period for each of the four projects, and decide which, on the basis of this criterion, is the most beneficial to pursue.

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discount factors:

Year_1 : 0.91;
Year_2 : 0.83;
Year_3 : 0.75;
Year_4 : 0.68;
Year_5 : 0.62.

Cumulative values from Year 1 to Year 5:

Year_1 : P_A = \$-910; P_B = \$18,200; P_C = \$2730; P_D = \$2730;
Year_2 : P_A = \$-830; P_B = \$16,600; P_C = \$2490; P_D = \$2490;
Year_3 : P_A = \$-750; P_B = \$15,000; P_C = \$2250; P_D = \$2250;
Year_4 : P_A = \$-1360; P_B = \$13,600; P_C = \$2040; P_D = \$2040;
Year_5 : P_A = \$6200; P_B = \$18,600; P_C = \$1860; P_D = \$4650;

NPVs:

NPV_P_A = \$-7650;
NPV_P_B = \$-18,000;
NPV_P_C = \$1370;
NPV_P_D = \$2160;

Project D is the most beneficial to pursue

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- Payback periods of Projects A and B are longer than 5 years.
- Cumulative values at the end of Year 4:
 - NPV_Project_C=\$-490
 - NPV_Project_D=\$-2490
- Their NPV values become to positive in the Year 5
- Project C is more likely to achieve payback than Project D.
- Project C might be the best one.

Read the story below and answer the following questions.

- **Q1.** Based on the narrative, list at least three main functional requirements for each of the four subsystems.
- **Q2.** Discuss at least two non-functional requirements (e.g., usability, performance and security requirements) which you think are important to the system. (You can make reasonable assumptions.)
- **Q3.** Who are the stakeholders for SBRU? For each type of stakeholder, what subsystems of the SBRU booking system are of particular interest?

Q1. Functional requirements

- Resort Relations
 - Sign up with SBRU (get an account)
 - Edit account information
 - Create/enter resort information for SBRU website
 - Post availability and prices of rooms/facilities
 - View/edit room availability
 - Retrieve completed reservations (View, report, or system interface)
 - Submit damage report
- Student Booking
 - Join SBRU/enter personal and financial information
 - View resort information and availability of rooms/facilities
 - Make a reservation (book a room/facility)
 - Make a payment for reservation
 - Cancel a reservation

- Accounting and Finance
 - Process student payments
 - Make refunds/correct payment errors
 - Process payouts to resorts
 - Edit/update/correct payouts
- Social Networking
 - Set personal privacy settings (viewable by friends only, resort users, resort employees, etc.)
 - Link up with “friends”
 - Chat with friends
 - Post comments on personal page
 - Upload pictures to personal page
 - Post comments on resort page
 - Upload pictures to resort page

Q2. Non-functional requirements

- Answers vary as long as some non-functional requirements are mentioned for the system. For example:
- Students will be using all types of laptops, tablets (iPads), smartphones (iPhones) to make reservations, check status, and especially social networking. Displays must be adaptable for all these types of computing devices.
- The system must sustain the network traffic around the world. The server must be available in 24 hours.
- The payment through the Website must be secured (e.g., using HTTPS and encryption)

Q3. Stakeholders

- **Student**—Student booking, Social Networking, Accounting and Finance
- **Resort**—Resort relations, Student Booking, Social Networking, Accounting and Finance