1. Consider the following two projects, calculate the NPVs of the two projects. If the two projects are mutually exclusive, which one should you choose? What about they are independent projects**?(answer: NPVa: -8.67; NPVb: 12.65; Mutually exclusive: B; Independent:B)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project** | **Year 0**  **Cash Flow** | **Year 1**  **Cash Flow** | **Year 2**  **Cash Flow** | **Year 3**  **Cash Flow** | **Year 4**  **Cash Flow** | **Discount Rate** |
| A | -100 | 40 | 40 | 40 | N/A | .15 |
| B | -73 | 30 | 30 | 30 | 30 | .15 |

NPV(15%, 40, 40, 40)-100 =🡺 NPV of project A -8.67

NPV(15%, 30, 30, 30, 30)-73 =🡺 NPV of project B 12.65

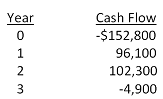
Rule:

Negative NPV project🡺 let go

Positive NPV project 🡺 adding value to the firm => accept the project

Mutually exclusive projects 🡺 pick one project, so pick the highest NPV project

Independent project 🡪 pick all NPV>0 project because they all add values to the firm

1. You are considering an investment with the following cash flows. If the required rate of return for this investment is 15.5 percent, should you accept the investment based solely on the internal rate of return rule? Why? (answer: **17.53%; Yes, rate<IRR, accept)**  
         
   irr(year0:year3)

Rule:

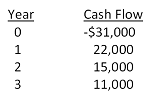
When discount rate < IRR 🡺 NPV>0 🡺 this is a good project since it adds values to the firm.

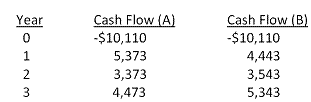
1. 3. It will cost $6,000 to acquire an ice cream cart. Cart sales are expected to be $3,600 a year for three years. After the three years, the cart is expected to be worthless as the expected life of the refrigeration unit is only three years. What is the payback period? **(answer: 1.67)**

YEAR CF

1. -6000
2. 3600 -2400
3. 3600
4. 3600

Answer: 1+ 2400/3600 = 1.67 years

1. An investment project provides cash flows of $1,190 per year for 10 years. If the initial cost is $8,000, what is the payback period? **(answer: 6.72)**
2. A firm evaluates all of its projects by using the NPV decision rule. At a required return of 14 percent, the NPV for the following project is \_\_\_\_\_ and the firm should \_\_\_\_\_ the project.**(answer: 7264.95, accept)**  
     

 6. Consider the following two mutually exclusive projects. Use 10% for required rate of return.  
     
What is the NPV of each project? What is the IRR of each project? **(answer: A- 922.78; 15.33%; B- 871.47; 14.68%)**  
What is the crossover rate for these two projects?  (**answer: 6.29%)**

**7**.  Cash Flow in Period

**Initial Outlay         1                 2                   3                          4**

-$4,000,000      $1,546,170    $1,546,170       $1,546,170         $1,546,170

The Internal Rate of Return (to nearest whole percent) i? (**answer: 20.03%)**

8. Welltran Corp. can purchase a new machine for $1,875,000 that will provide an annual net cash flow of $650,000 per year for five years. The machine will be sold for $120,000 after taxes at the end of year five. What is the net present value of the machine if the required rate of return is 13.5%. (**Answer: $447,291.91. Hint: year 5’s cash flow is 650k+120k = 770k)**

**Year Cash flow**

1. **-1875000**
2. **650000**
3. **650000**
4. **650000**
5. **650000**
6. **650000 + 120000**